

SEMESTER – I

CORE - PAPER I

HISTORY OF INDIA UPTO A.D.1206

(5 CREDITS)

TEACHING HOURS: 75

COURSE OBJECTIVES:

- To enable students to understand India's cultural and historical legacy.
- To instill in students a sense of pride in Indian history and heritage.
- To help students learn about the important kingdoms and religions of ancient India

UNIT I : Geographical Features – Sources of Indian History – Indus Valley Civilization – Early Vedic Age - Later Vedic Age - Ancient Tamil Civilization. **(15Hours)**

UNIT II : Buddhism and Jainism – Rise of Magadha – Alexander's Invasion – The Mauryas – Chandragupta Maurya – Asoka – Ashoka's Dhamma – Mauryan Administration – Art and Architecture. **(15Hours)**

UNIT III : Satavahanas – Kushanas – Kanishka – Gupta Empire – Chandragupta – Samudragupta – Administration – Social, Economic and Cultural Developments – Golden Age of Guptas. **(15Hours)**

UNIT IV: Harshavardhana – Administration – Religious Contributions – Chalukyas – The Rajputs – Art and Architecture. **(15Hours)**

UNIT V : Arab Conquest of Sind – Mahmud of Ghazni – Invasions – Mohammed of Ghor – Impact. **(15Hours)**

RECOMMENDED TEXT BOOKS:

S.No.	Author	Title of the Book	Publisher	Year
1	Majumdar R.C.	Advanced History of India	Macmillan, London,	1946
2	Sharma L. P.	History of Ancient India	Vikas Publishing, New Delhi	1981
3	V.D. Mahajan	Ancient India	S.Chand &Company, New Delhi,	1960.

BOOKS FOR REFERENCE

S.No.	Author	Title and Publisher
1	R.C.Majumdar, H.C.Raychaudhuri & Datta	An Advanced History of India, Macmillan, Madras, 1994.
2	Majumdar R.C.	Advanced History of India, Macmillan, London, 1946
3	Sharma L. P.	History of Ancient India, Vikas Publishing, New Delhi, 1981
4	V.D. Mahajan	Ancient India, S.Chand &Company, New Delhi, 1960
5	Romila Thapar	Ancient India, Penguin Books, England, 1966.
6	N. Subramanian	Indiya Varalaru (Tamil), New Century Book House, Chennai, 2004.

I – SEMESTER
CORE – PAPER – I
SOCIAL AND CULTURAL HISTORY OF INDIA UPTO A.D. 1526
(4 CREDITS) Teaching Hours: 90

COURSE OBJECTIVES:

- To comprehend the vivid picture of the distinct and unique culture of India through vast sources.
- To educate about the discovery of a great proto-historic civilization, variously called as Indus Valley Civilization or Harappan Culture and the supreme Vedic age
- To understand the distinct and unique features of ancient Indian religions and the Re-polarization of Society
- To study the Persian and Greek influence on Indian Society.
- To analyze the Social, Economic and Religious aspects of ancient and medieval India up to AD 1526

Unit I	:	Sources for the study of Ancient Indian History – Indus Valley Civilization - Important features – Vedic Culture – Later Vedic period.	20 Hours
Unit II	:	Jainism and Buddhism – Re-polarisation of Society – Bhagavata Cult, Vasudeva Cult – Vaishnavism – Saivism – Education – Persian and Greek influence on Indian Society.	20 Hours
Unit III	:	Age of Mauryas – Social conditions – Literature, Art and Architecture – Ashoka's Dhamma – Mahayanism – Gandhara, Mathura School of Art.	20 Hours
Unit IV	:	Guptas – Cultural Florescence – Art and Architecture – Temples – Sculpture – Painting – Religion – Education – Foreign Accounts – Society and culture under Vardhanas – Rajput Society.	15 Hours
Unit V	:	Delhi Sultanate – Social and Economic condition – Trade and Commerce – Peasants and Artisans – New crafts – Industrial Technology – Literature, Art and Architecture.	15 Hours

RECOMMENDED TEXTBOOKS:

S.No.	Title of the book	Authors	Publishers	Year of Publication
1	The Wonder that was India	A.L. Basham	Sidgwick and Jackson	1954
2.	Ancient India	V.D. Mahajan	S.Chand and Company, New Delhi	1960
3.	An Introduction to the Study of Indian History	D.D. Kosambi	Popular Prakashan, Delhi	1975 2 nd Edition

M.PHIL HISTORICAL STUDIES
CORE – PAPER – I
HISTORIOGRAPHY AND HISTORICAL METHODS

COURSE OBJECTIVES:

- Comprehend the nature and scope of History with other social sciences.
- Be acquainted with the techniques in Historical writing.
- Critically analyse the importance of historical sources
- Appreciate the contribution of Historians to Historiography
- Expand the critical thinking skills and research skills needed to frame a successful research project.

- Unit I:** Meaning, Nature and Scope of History – Uses and Misuses – Kinds of History – Lessons of History- History as Science and Art – History and other Social Sciences: Archaeology, Anthropology, Economics, Ethics, Geography, Literature, Philosophy, Political Science, Psychology
- Unit II:** Philosophy of History – Historical methods – Qualitative and Quantitative techniques.
- Unit III :** Reasons for undertaking Research – Choice of Subject – Objectivity and Subjectivity in writing history - Collection of Materials – Primary and Secondary Sources – External Criticism and Internal Criticism.
- Unit IV:** Trends in Indian Historiography – Ancient, Medieval and Modern Indian Historians in India – Ancient: Bilhana, Kalhana, R.G. Bandarkar – Medieval: Barani, AbulFazl, Sir Jadunath Sarkar – Modern: Vincent Smith, R.C. Majumdar, D. D. Kosambi, K.A. Nilakanta Sastri
- Unit V:** Synthesis – Organizing Material – Writing of History – Interpretation – Foot Notes – Bibliography Documentation.

RECOMMENDED TEXT BOOKS:

S.No.	Author	Title and Publisher
1	Rajayyan K.	Historiography: History in Theory and Method, Raj Publishers, Madurai, 1976
2	Majumdar R.K. and Srivastava A.N.	Historiography, SBD Publishers and Distributors, New Delhi, 1998
3	Sheik Ali S.	History – Its Theory and Method, Macmillan India Publication, Madras, 1978.

BOOKS FOR REFERENCE:

S.No.	Author	Title and Publisher
1	Anderson, Durston and Poole	Thesis and Assignment Writing, Wiley Eastern Limited, New Delhi, 1970
2	Carr E.H.	What is History, Penguin Books, London, 1982
3	Rajayyan K.	Historiography: History in Theory and Method, Raj Publishers, Madurai, 1976
4	Hockett, Homer C., Kathirvel S.	Research Methodology in History, Crenio Centre,

**QUAID - E- MILLATH GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS), CHENNAI - 600 002.**

**ENGLISH DEPARTMENT
B.A. ENGLISH LITERATURE
SYLLABUS**



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

(OFFERED FROM THE ACADEMIC YEAR 2017 -2018)

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RULES AND REGULATIONS
Quaid-E-Millath Government College for Women (Autonomous),
Chennai – 600 002.

B.A English Literature Syllabus

Choice Based Credit System

Quaid-E-Millath Government College for Women (Autonomous), offers the Semester System of Education with credits for UG courses. Credit simply means the weightage given to what is taught and what is learnt. It is normally related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures / tutorials / laboratory work / seminar / project work / practical training / viva voce etc to facilitate effective teaching and learning and the credits are assigned accordingly, depending on the content and the specialization.

The minimum credit requirement for a three – year UG course shall be 140 inclusive of Part IV and Part V.

REGULATIONS

1. Duration

- a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semester, the second academic year, the third and fourth semesters and the third academic year, the fifth and sixth semester.
- b. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year.

2. Course of Study

The course of study for Bachelor Degree Courses shall comprise of the following:

Foundation Courses: The courses shall comprise the study of:

- Part - I Tamil - 6 Credits for B.A. and B.Sc.; 4 Credits for B.Com.
- Part – II English – 6 Credits for B.A and B.Sc.; 4 Credits for B.Com.

Part III:

- Core Subjects (B.A.-79 Credits; B.Sc. - 79 Credits and 91 Credits– B.Com.)

- Allied Subjects (20 Credits for B.A., B.Sc., and B.Com.)

Part IV:

- Soft Skill (4 Papers) (8 Credits)
- Non-Major Elective (2 Papers) (4 Credits)
- Environmental Studies (2 Credits)
- Value Education (2 Credits)

Part V:

- Extension Activities (1 Credit)

3. Compulsory Extension Service

A candidate shall be awarded a maximum of one credit for Compulsory Extension Service. All students shall have to enroll for NSS/NCC/Sports and Games/Rotary/Youth Red Cross or any other service organization in the College and shall have to put in compulsory attendance of 40 hours, which shall be duly certified. If a student lacks 40 hours attendance in the First year, she shall have to compensate the same during the subsequent years.

Students who complete the minimum attendance of 40 hours in One year only will get credit and those who complete the attendance of 80 or more hours in Two years will get I credit.

Distribution of Marks for Continuous Assessment

Part I, Part II and Part III

Test			Best 2 out of 3	Assignment	Seminar / Creative Presentation	Model Exam	Attendance	Total
20	20	20	40	10	15	25	10	100

Test (Best two out of three) : 40 Marks
 Assignment / Seminar / Creative Presentation : 25 Marks
 Model Examination : 25 Marks

Attendance

90 – 100%	-	10 Marks
80 – 89%	-	9 Marks
75 – 79%	-	8 Marks
65 – 74%	-	7 Marks
55 – 64%	-	5 Marks
Below 55%	-	0 – Not Eligible

End Semester Examination : Question Paper Format

Section A	:	10 x 2 = 20 Marks (10 out of 12)
Section B	:	5 x 5 = 25 Marks (5 out of 8)
Section C	:	3 x 10 = 30 Marks (3 out of 5)
Total	:	75 Marks

Part IV:

Semester End Examination	:	60 Marks
Continuous Internal Assessment	:	40 Marks

Distribution of CIA Marks:

Seminar / Presentation	Assignment / Term Paper	Written / Oral Test	Total
20	10	10	40

End Semester Examination : Theory Paper – 60 Marks – Duration 2.30 hours.

Question Paper Pattern : 10 x 6 Marks = 60 Marks (10 out of 15)

The following method be adopted for allotting credit for UG/PG Courses offered in the affiliated colleges as per TANSCHÉ by this University

UG COURSES

The total credit allotted for **UG COURSES** is **minimum of 140 credits**

Sl. No	Paper	No. of Papers	Credits	Total Credits
1	Part-I Language	4 Papers	3 Credits	12
2	Part-II English	4 Papers	3 Credits	12
3	Part-III Core Subjects	13-15 Papers	4-5 Credits	60
	Allied Subjects	4 Papers	5 Credits	20
	Project / Electives with 3 courses	Project (Or)	15 Credits	15
		3 Papers	5 Credits	

4	Part-IV Non-Major Elective / Basic Tamil / Adv. Tamil	2 Papers	2 Credits	4
	Soft Skills	4 Papers	3 Credits	12
	Environmental Studies	1 Papers	2 Credits	2
	Value Education	1 Papers	2 Credits	2
5	Part-V Extension Activity		1 Credits	1
	Total			140

Paper on Environmental Studies (ES) shall be dealt by the respective core paper department; the aim of this course is to learn the major concepts of Environmental Studies in the context of Core subject and is assigned 2 credits.

Institutions are free to offer papers of their interest in all categories, Core Allied, NME.

PROGRAMME OUTCOMES

UNDERGRADUATE ARTS

On completion of the Programme, the learner is able to:

1. Apply human values
2. Identify the subject goals
3. Formulate creative skills
4. Acquire Communication Skills and subject knowledge
5. Analyse the responsibilities

PROGRAMME SPECIFIC OUTCOMES

On completion of the specific programme B.A. English Literature the student will be able to:

1. Acquire a broad perspective of the universal human experience
2. Comprehend the socio-historic cultural background of literatures in English
3. Identify and analyse various theories in language and literature
4. Develop skills of interpretation in the various literary genres
5. Appreciate the aesthetics of language and literature

PROGRAMME PROFILE

B.A. ENGLISH LITERATURE

SEM	PART	COMPONENT	COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS / WK	TOTAL HOURS	CA	SE	TOTAL
I	II	Language	173801	English Paper I	3	4	60	25	75	100
II	II	Language	173802	English Paper II	3	4	60	25	75	100
III	II	Language	173803	English Paper III	3	6	90	25	75	100
IV	II	Language	173804	English Paper IV	3	6	90	25	75	100
	I	Language		Tamil	12					

SEM	PART	COMPONENT	COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS / WK	TOTAL HOURS	CA	SE	TOTAL
I	III	Core	171501	British Prose	4	5	75	25	75	100
	III		171502	Children's Literature	4	5	75	25	75	100
	III	Allied	171591	Socio-cultural History of England	5	6	90	25	75	100
	IV	NME - I	17151	Vocabulary Extension and Etiquette	2	2	30	40	60	100
	IV	Soft Skills I	179001	Essential Social Skills I	3	2	30	40	60	100

II	III	Core	171503	British Poetry	4	5	75	25	75	100
	III		171504	Indian Writing in English	4	5	75	25	75	100
	III	Allied	171592	Literary Genres and Terms	5	6	90	25	75	100
	IV	NME- II	17152	Writing Skills	2	2	30	40	60	100
	IV	Soft Skills II	179002	Essential Social Skills II	3	2	30	40	60	100

SEM	PAR T	COM PON ENT	COUR SE CODE	TITLE OF THE PAPER	CRE DITS	HO UR S/ WK	TO T AL HO U RS	C A	S E	Total
III	III	Core	171505	British Literature Drama and Fiction	4	5	75	25	75	100
	III		171506	American Literature I	4	4	60	25	75	100
	III	Allied	171593	History of English Literature I	5	5	75	25	75	100
	IV	Soft Skills III	179003	Personality Enrichment	3	2	30	40	60	100
	IV	EVS	174001	Environmental Studies		2	30			
IV	III	Core	171507	Prize Winning Literature	4	5	75	25	75	100
	III		171508	American Literature II	4	5	75	25	75	100
	III	Allied	171594	History of English Literature II	5	5	75	25	75	100

	IV	Soft Skills IV	179004 A	Fundamentals of Information Technology	3	2	30	40	60	100
	IV	EVS	174002	Environmental Studies	2	1	15	40	60	100
	V	Ext.			1					

SE M	PAR T	COMP ONEN T	COU RSE COD E	TITLE OF THE PAPER	CRE DITS	HO UR S/ WK	TO T AL HO U RS	C A	S E	Tota l
V	III	Core	171509	Shakespeare	4	6	90	25	75	100
	III		171510	New Literature	4	6	90	25	75	100
	III		171511	Women's Writing	4	6	90	25	75	100
	III		171512	Language and Linguistics	4	6	90	25	75	100
	III	Elective I	171513	Journalism	5	5	75	25	75	100
				Creative Writing						
	IV	VE	174003	Value Education		1	15			
	III	Core	171514	Literary Theory and Criticism	4	6	90	25	75	100
	III		171515	English Language Teaching	4	6	90	25	75	100

VI	III		17151 6	World Classics	4	6	90	2 5	7 5	100
	III	Elective II	17151 7	Indian Literatures in English Translation	5	6	90	2 5	7 5	100
				Modern European Literature						
	III	Elective III	17151 8	English for Competitive Examinations	5	5	75	2 5	7 5	100
				Copy Editing						
	IV	VE	17400 4	Value Education	2	1	15	4 0	6 0	100
Total					140					

EVALUATION PATTERN FOR CONTINUOUS ASSESSMENT – U.G.,
INTERNAL VALUATION BY COURSE TEACHERS

PART I, II AND III

S.No.	COMPONENT	TIME	MAX. MARKS	C.A. MARKS
1	TEST 1	1 HOUR	25 (To be Converted)	20
2	TEST 2	1 HOUR	25 (To be Converted)	20
3	ASSIGNMENT			25
4	MODEL EXAMINATION	3 HOURS	75 (To be Converted)	25
5	ATTENDANCE	90 DAYS PER SEMESTER		10
GRAND TOTAL				100
TOTAL C.A. MARKS REDUCED TO				25

C.A. QUESTION PAPER PATTERN – U.G.,

Knowledge Level	Section	Word Limit	Marks	Total
K1	A – 5 x 2 marks	50	10	25
K1, K2	B – 1 x 5 marks	200	5	
	C – 1 x 10 marks	500	10	

C.A. QUESTION PAPER PATTERN FOR PART IV

Knowledge Level	Section	Word Limit	Marks	Total
K1, K2	A – 1 x 10 marks	350	10	10

RUBRICS FOR CONTINUOUS ASSESSMENT

S.No.	Component	Criteria
1	Assignment	Content Originality Presentation Schematic Representation Diagram Bibliography
2	Seminar	Organisation Subject Knowledge Visual Aids Confidence level Presentation Communication Language
3	Field Visit	Participation Preparation Attitude Leadership
4	Participation	Answering Questions Clearing Doubts Participating in Group Discussions Regular Attendance

END SEMESTER EVALUATION PATTERN – U.G.

SEMESTER I/II/III/IV/V/VI

PART I/II/III

SINGLE VALUATION BY EXTERNAL EXAMINER

MAXIMUM MARK : 75

PASSING MARK : 30

PART IV

SINGLE VALUATION BY INTERNAL EXAMINER

WRITTEN TEST

MAXIMUM MARK : 60

PASSING MARK : 24

FOUNDATION COURSE

SEMESTER

TITLE OF THE PAPER

I

English Paper I

II	English Paper II
III	English Paper III
IV	English IV
	Extension Activities

ENGLISH PAPER-I

TOTAL HOURS: 4 (60 Hours)
173801

COURSE CODE:

CREDITS: 3

COURSE OBJECTIVES:

To enable the students to -

1. Hone the LSRW skills
2. Acquire Grammar skills
3. Develop Vocabulary
4. Perfect Comprehension skills
5. Enhance Communication skills in English

COURSE OUTLINE:

UNITS	UNIT DESCRIPTION	Total Hours
Bridge Course	Language Activities, Language Games and Worksheet on English Language	10 hrs
Unit I- Prose	How to be a doctor Reading and interpretation of the text (2 hr) Comprehension and exercises (2 hr) Discussion/ revision/ activities on the topic (1hr) Fifteen Years Reading and interpretation of the text (2 hr) Comprehension and exercises (2 hr) Discussion/ revision/ activities on the topic (1hr) Kiran Bedi Reading and interpretation of the text (2 hr) Comprehension and exercises (2 hr) Discussion/ revision/ activities on the topic (1hr)	15 hrs
Unit II- Short Story	The Model Millionaire Reading and interpretation of the text (2 hr) Comprehension and exercises (2 hr) Discussion/ revision/ activities on the topic (1hr) Mrs. Packletide's Tiger Reading and interpretation of the text (2 hr) Comprehension and exercises (2 hr) Discussion/ revision/ activities on the topic (1hr) The Dying Detective Reading and interpretation of the text (2 hr) Comprehension and exercises (2 hr) Discussion/ revision/ activities on the topic (1hr)	15 hrs
Unit III - Vocabulary	One Word substitute (1 hr) Foreign Words (1 hr) Jumbled Letters (1 hr) Discussion and activities on the above topics (1hrs)	4 hrs
Unit IV - Grammar	Degrees of Comparison (1 hr) Articles (1 hr) Discussion and activities on Degrees of Comparison and Articles (1 hr)	3 hrs
Unit V- Composition	Filling in Forms and Challans (1 hr) Reading Comprehension (2 hrs) Discussion and activities on the above topics (1hrs)	4 hrs
Revision	Revision of all the units	7 hrs

Continuous Assessment Tests	(CAT-1 & CAT2) 2 X 1 hr = 2hrs	2 hrs

Recommended Books

1. Gnanaskandan, S. *Limelight -1*,SSK Publishers & Distributors, 2017.
2. Balan, Jayashree. *Spoken English*, Mc Graw Hill, Edition: 2, ISBN: 9780070704909

Reference books

1. Joseph, K. V. *A Textbook Of English Grammar & Usage*, Mc Graw Hill, Edition: 2, ISBN: 9780070704886
2. Taylor, Grant. *English Conversation Practice*, Edition: 1, Mc Graw Hill, ISBN: 9780070996038.
3. Murphy, Raymond. *English Grammar In Use*, Cambridge University Press, 2004.
4. Lewis, Norman. *Word Power Made Easy- The Complete Handbook for Building A Superior Vocabulary*, Pocket Books, 1978.
5. Singh, Ajay. *Proficiency in Reading Comprehension*. Arihant publishers, 2018.

Journals

1. <https://learnenglish.britishcouncil.org/magazine>
2. <https://www.amazon.com/Readers-Digest/dp/B004GVZUUY?tag=fluentu-20>

E-Resources

1. <https://learnenglishteens.britishcouncil.org/skills/listening>
2. <https://learnenglishteens.britishcouncil.org/skills/speaking>
3. <https://learnenglishteens.britishcouncil.org/skills/writing>
4. <https://learnenglish.britishcouncil.org/reading>
5. <https://learnenglish.britishcouncil.org/grammar>

COURSE/ LEARNING OUTCOMES:

CO Number	CO STATEMENT
CO 1	LEARNING OUTCOMES The students will demonstrate improved LSRW skills.
CO 2	The students will apply their acquired Grammatical knowledge while speaking and writing in English.
CO 3	The students will use a vast range of Vocabulary while writing and speaking in English.
CO 4	The students will very easily Comprehend all the spoken and written communications in English.
CO 5	The students will be able to communicate effectively in English.

ENGLISH PAPER-II

TOTAL HOURS: 4 (60 Hours)
173802

COURSE CODE:

CREDITS: 3

COURSE OBJECTIVES:

To enable the students to -

- 1.Hone the LSRW skills
- 2.AcquireGrammar skills
- 3.DevelopVocabulary
- 4.Perfect Comprehension skills
- 5.Enhance Communication skills in English

COURSE OUTLINE:

UNITS	UNIT DESCRIPTION	Total Hours
Unit I- Poetry	The Lotus by Toru Dutt Reading and interpretation of the text (2 hr) Comprehension and exercises (3 hr) Discussion/ revision/ activities on the topic (2hr) Solitude by Alexander pope	21 hrs

	Reading and interpretation of the text (2 hr) Comprehension and exercises (3 hr) Discussion/ revision/ activities on the topic (2hr) Mending Wall by Robert Frost Reading and interpretation of the text (2 hr) Comprehension and exercises (3 hr) Discussion/ revision/ activities on the topic (2hr)	
Unit II- One- Act plays	The Bear Reading and interpretation of the text (4 hr) Comprehension and exercises (3 hr) Discussion/ revision/ activities on the topic (2hr) Monkey's Paw Reading and interpretation of the text (4 hr) Comprehension and exercises (3 hr) Discussion/ revision/ activities on the topic (2hr)	18 hrs
Unit III- Vocabulary	Spelling Test (2 hrs) Compound Words (2 hrs) Discussion and activities on the above topics (2hrs)	6 hrs
Unit IV- Grammar	Relative pronoun (3hrs) Discussion and activities on Degrees of Comparison and Articles (2 hr)	5 hrs
Unit V- Composition	Interpreting Charts, Tables, etc., (3 hrs) Discussion and activities on the above topics (2hrs)	5 hrs
Revision	Revision of all the units	5 hrs
Continuous Assessment Tests	(CAT-1 & CAT2) 2 X 1 hr = 2hrs	2 hrs

Recommended Books

3. Gnanaskandan, S. *Limelight -1*,SSK Publishers & Distributors, 2017.
4. Balan, Jayashree. *Spoken English*, Mc Graw Hill, Edition: 2, ISBN: 9780070704909

Reference books

6. Joseph, K. V. *A Textbook Of English Grammar & Usage*, Mc Graw Hill, Edition: 2, ISBN: 9780070704886
7. Taylor, Grant. *English Conversation Practice*, Edition: 1, Mc Graw Hill, ISBN: 9780070996038.
8. Murphy, Raymond. *English Grammar In Use*, Cambridge University Press, 2004.
9. Lewis, Norman. *Word Power Made Easy- The Complete Handbook for Building A Superior Vocabulary*, Pocket Books, 1978.
10. Singh, Ajay. *Proficiency in Reading Comprehension*. Arihant publishers, 2018.

Journals

3. <https://learnenglish.britishcouncil.org/magazine>
4. <https://www.amazon.com/Readers-Digest/dp/B004GVZUUY?tag=fluentu-20>

E-Resources

1. <https://learnenglishteens.britishcouncil.org/skills/listening>
2. <https://learnenglishteens.britishcouncil.org/skills/speaking>
3. <https://learnenglishteens.britishcouncil.org/skills/writing>
4. <https://learnenglish.britishcouncil.org/reading>
5. <https://learnenglish.britishcouncil.org/grammar>

COURSE/ LEARNING OUTCOMES:

CO Number	CO STATEMENT
CO 1	LEARNING OUTCOMES The students will demonstrate improved LSRW skills.
CO 2	The students will apply their acquired Grammatical knowledge while speaking and writing in English.
CO 3	The students will use a vast range of Vocabulary while writing and speaking in English.
CO 4	The students will very easily Comprehend all the spoken and written communications in English.
CO 5	The students will be able to communicate effectively in English.

ENGLISH PAPER-III

TOTAL HOURS: 6 (90hrs)
173803

COURSE CODE:

CREDITS: 3

COURSE OBJECTIVES:

1. To present a conducive literary experience to the undergraduate students
2. To improve the comprehensive skill of the students through reading the literary work
3. Grammar units are introduced to improve the learner's standard of English

COURSE OUTLINE:

UNITS	UNIT DESCRIPTION	Total Hours
Unit I- Prose	My visions for India Reading and interpretation of the text (2 hr) Comprehension and exercises (2 hr) Discussion/ revision/ activities on the topic (1hr)	25 hrs
	The Best Investment I ever Made Reading and interpretation of the text (2 hr) Comprehension and exercises (2 hr) Discussion/ revision/ activities on the topic (1hr)	
	Marie Curie Reading and interpretation of the text (2 hr) Comprehension and exercises (2 hr) Discussion/ revision/ activities on the topic (1hr)	
Unit II- Short Story	The Necklace Reading and interpretation of the text (2 hr) Comprehension and exercises (2 hr) Discussion/ revision/ activities on the topic (1hr)	25 hrs
	Little Girls Wiser Than Men Reading and interpretation of the text (2 hr) Comprehension and exercises (2 hr) Discussion/ revision/ activities on the topic (1hr)	
	An Astrologer's Day Reading and interpretation of the text (2 hr)	

	Comprehension and exercises (2 hr) Discussion/ revision/ activities on the topic (1hr)	
Unit III- Speech writing	Salutation of Greeting (4 hrs) Discourse of Topic(5 hrs) Narration of facts, presentation of data, relevant examples, etc(5 hrs)	13 hrs
Unit IV -Composition	Advertisement writing(3hrs) Responding to advertisements (4hrs)	7 hrs
Unit V- Grammar	Articles (2hrs) Preposition (2hrs) Question Tags (4hrs)	8 hrs
Revision	Revision of all the units	9 hrs
Continuous Assessment Tests	(CAT-1 & CAT2) 2 X 1 hr = 2hrs	3 hrs

Recommended Books

5. Gnanaskandan, S. *Limelight -1*,SSK Publishers & Distributors, 2017.
6. Balan, Jayashree. *Spoken English*, Mc Graw Hill, Edition: 2, ISBN: 9780070704909

Reference books

11. Joseph, K. V. *A Textbook Of English Grammar & Usage*, Mc Graw Hill, Edition: 2, ISBN: 9780070704886
12. Taylor, Grant. *English Conversation Practice*, Edition: 1, Mc Graw Hill, ISBN: 9780070996038.
13. Wren & martin, *English Grammar and Composition*: S. Chand India, 2018
14. Murphy, Raymond, *English Grammar in use* : Cambridge University Press, 1985.
15. Singh, Ajay. *Proficiency in Reading Comprehension*. Arihant publishers, 2018.

Journals

1. <https://www.eajournals.org>
2. <https://academic.oup.com.elij>

E-Resources

1. <https://learnenglishteens.britishcouncil.org/skills/listening>
2. <https://learnenglishteens.britishcouncil.org/skills/speaking>
3. <https://learnenglishteens.britishcouncil.org/skills/writing>
4. <https://learnenglish.britishcouncil.org/reading>
5. <https://learnenglish.britishcouncil.org/grammar>

COURSE/ LEARNING OUTCOMES:

CO Number	CO STATEMENT
CO 1	To Train her to appreciate the nuances of poetry through paraphrasing and critiquing
CO 2	To build the vocabulary through the dialogues of the one act plays
CO 3	To produce well organised academic essays
CO 4	To build the employability skills
CO 5	To get accuracy of grammatical structures in English

ENGLISH PAPER-IV

TOTAL HOURS: 6 (90hrs)
173804

COURSE CODE:

CREDITS: 3

COURSE OBJECTIVES:

To enable the students to -

1. Familiarity with various genres would help students to keep up with the new trends.
2. To present an enjoyable experience of theatrics, and discourses.
3. Study of communicative skills focuses to enhance the employability skills and language competence of the students in the present global scenario.

COURSE OUTLINE:

UNITS	UNIT DESCRIPTION	Total Hours
Unit I- Poetry	Where the Mind is without Fear Reading and interpretation of the text (2 hr) Comprehension and exercises (3 hr) Discussion/ revision/ activities on the topic (2hr) The pulley Reading and interpretation of the text (2 hr) Comprehension and exercises (3 hr) Discussion/ revision/ activities on the topic (2hr) Wait till the Majesty of death Reading and interpretation of the text (2 hr) Comprehension and exercises (3 hr) Discussion/ revision/ activities on the topic (2hr)	21 hrs
Unit II- One- Act plays	The Bishop's Candlesticks Reading and interpretation of the text (4 hr) Comprehension and exercises (3 hr) Discussion/ revision/ activities on the topic (2hr) A meeting in a Forest Reading and interpretation of the text (4 hr) Comprehension and exercises (3 hr) Discussion/ revision/ activities on the topic (2hr) The Trial of a Billy Scott Reading and interpretation of the text (4 hr) Comprehension and exercises (3 hr) Discussion/ revision/ activities on the topic (2hr)	25 hrs
Unit III- language study and communication	Report writing (5hrs) Interviewing (5hrs)	10hrs
Unit IV- Composition	Resume writing (5hrs) E-mail Writing (4hrs)	9 hrs
Unit V- Grammar	Reported speech (4hrs) Active, Passive voice (5hrs)	9 hrs
Revision	Revision of all the units	8 hrs

Continuous Assessment Tests	(CAT-1 & CAT2) 2 X 1 hr = 2hrs	3hrs

Recommended Books

1. Gnanaskandan, S. *Limelight -1*,SSK Publishers & Distributors, 2017.
2. Balan, Jayashree. *Spoken English*, Mc Graw Hill, Edition: 2, ISBN: 9780070704909

Reference books

1. Joseph, K. V. *A Textbook Of English Grammar & Usage*, Mc Graw Hill, Edition: 2, ISBN: 9780070704886
2. Taylor, Grant. *English Conversation Practice*, Edition: 1, Mc Graw Hill, ISBN: 9780070996038.
3. Wren & martin, *English Grammar and Composition*: S. Chand India, 2018
4. Murphy, Raymond, *English Grammar in use* : Cambridge University Press, 1985.
5. Singh, Ajay. *Proficiency in Reading Comprehension*. Arihant publishers, 2018.

Journals

1. <https://www.eajournals.org>
2. <https://academic.oup.com/eli>

E-Resources

1. <https://learnenglishteens.britishcouncil.org/skills/listening>
2. <https://learnenglishteens.britishcouncil.org/skills/speaking>
3. <https://learnenglishteens.britishcouncil.org/skills/writing>
4. <https://learnenglish.britishcouncil.org/reading>
5. <https://learnenglish.britishcouncil.org/grammar>

COURSE/ LEARNING OUTCOMES:

CO Number	CO STATEMENT
CO 1	To employ pre-reading skimming and pre-writing techniques
CO 2	To enhance writing skills through exercises on speech writing and advertisement writings
CO 3	To impart knowledge of literary canons in English
CO 4	To improve the ability to write creatively and critically

CO 5	To add an augment to the English Language competency through grammar exercises

SEMESTER – I

Core	British Prose
	Children's Literature

Allied	Socio-Cultural History Of England
NME - I	Vocabulary Extension and Etiquette
Soft-Skills-I	Essential Social Skills – I

SEMESTER I
BRITISH PROSE

TOTAL HOURS: 5 (75 Hours)

COURSE CODE: 171501

CREDITS: 4

COURSE OBJECTIVES:

1. To acquaint the students to the masterpieces of British prose writers.
2. To introduce non-fictional British prose writing.
3. To expose students to various styles of writing.

COURSE OUTLINE:

UNIT I

Hours: 15

Francis Bacon	:	Of Love Of Marriage and Single Life
Addison and Steel	:	Sir Roger's Reflection of the Widow On Ghosts and Apparitions

UNIT II**Hours: 15**

Oliver Goldsmith	:	The Story of the Chinese Matron (The Citizen of the World) The History of the Beautiful Captive
Charles Lamb	:	The Superannuated Man New Year's Eve

UNIT III**Hours: 15**

William Hazlitt	:	My First Acquaintance with Poets On the Conversation of Authors
John Ruskin	:	Rose Gardens (Letters)

UNIT IV**Hours: 14**

Thomas Carlyle	:	The Hero as King

UNIT V**Hours: 16**

G. K. Chesterton	:	A Piece of Chalk
Aldous Huxley	:	Jesting Pilate – The Pacific (Part III)
Robert Lynd	:	Why Tall Men Are So Modest

RECOMMENDED TEXTBOOKS:

1. Addison Joseph. *Coverley Papers from The Spectator*, Macmillan & Co. Ltd., 1965.
2. Srinivasan Archana. *Biographies of Eminent English Writers*, Sura Books (Pvt.) Ltd., Chennai, 2006.
3. Ruskin John, *Time and Tide*, Smith, Elder & Co., Waterloo, 1872

REFERENCE BOOKS:

1. Trilling Lionel. *Mathew Arnold*, George Allen & Unwin Lt., London, 1955.
2. Daiches A David. *A Study of Literature: Readers and Critics*, Cornell University Press, New York, 1948.
3. Thomson J.A.K. *Classical Influences on English Prose*, George Allen & Unwin Ltd., London, 1956.
4. Meckier Jerome. *Aldous Huxley Satire and Structure*, Chattos&Windus, London, 1971.
5. BanshiDhar. G.K.Chesterton and the Twentieth Century English Essay, S. Chand & Company Ltd., New Delhi, 1977.

JOURNALS:

1. International Journal of Trend in Scientific Research and Development - IJTSRD.
2. Literary Perspectives.

E-LEARNING RESOURCES:

1. https://www.academia.edu › Essays_of_Francis_Bacon_A_Moral_Perspecti...

2. <https://www.englitmail.com> › 2016/11 › *lamb-as-essayist*
3. <https://www.rct.uk/collection/1084276/time-and-tide-by-weare-and-tyne-twenty-five-letters-to-the-working-man-of>
4. www.victorianweb.org › authors › carlyle › works
5. <https://neoenglish.wordpress.com/2010/12/27/english-essay-and-prominent-essayists-during-the-twentieth-century/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Appreciate the works of British prose writers.
CO 2	Distinguish between fictional and non-fictional British prose writing.
CO 3	Classify the writers according to the age.
CO 4	Identify various styles of writing.
CO 5	Write distinct forms of essays.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	3	2	3
CO4	2	3	3	2	3
CO5	2	3	3	2	2
AVERAGE	2.6	3	3	2	2.8

KEY: **STRONGLY** CORRELATED-3 **MODERATELY** CORRELATED-2 **WEAKLY** CORRELATED-1
NO CORRELATION-0

I B.A. SEMESTER - I
CHILDREN'S LITERATURE

TOTAL HOURS: 5 (75Hours)

COURSE CODE:171502

CREDITS: 4

COURSE OBJECTIVES:

1. To introduce the students to the genre of children's literature.
2. To help them to explore the early forms of children's Literature.
3. To show how children's literature moved into the realm of entertainment.

COURSE OUTLINE:

UNIT I: INTRODUCTION **Hours: 15**

Peter Hunt	:	The World of Children's Literature Studies
Philip Pullman	:	Introduction to Fairy Tales

UNIT II: POETRY **Hours: 15**

The Oral Literature	:	The King Joins the Sun God
T.S.Eliot	:	Gus: The Theatre Cat
Jane Taylor	:	The Cow and the Ass
Edward Lear	:	The Jumblies

UNIT III: FAIRY TALES AND FABLES **Hours: 15**

Grimm's Tales	:	The Devil with the Three Golden Hairs
		The Twelve Dancing Princess
Hans Christian Anderson	:	The Little Match-Seller
		The Last Pearl
Niu Lang and Zhi Nu.	:	The Cowherd and the Beautiful Weaver
Jin Lou	:	How the Phoenix got her fine Plumage

Aesop Fables : The Eagle, the Cat and the Wild Sow
The Labourer and the Nightingale

UNIT IV: FOLKLORE

Hours: 15

Oral Literature : The Woman Who Killed Her Co-wife (African)
The Legend of Kintu (African)
Panchatantra : The Bird with Golden Dung
Merchant's Strong Tooth
Brer Rabbit : Brer Rabbit and the Alligator
Brer Rabbit Gets Brer Fox's Dinner
Arabian Nights Stories : The Story of Sindbad the Sailor
The Second Voyage of Sindbad the Sailor

UNIT V: FICTION

Hours: 15

Lewis Carroll : The Lion and the Unicorn
Enid Blyton : The Secret Seven

RECOMMENDED TEXTBOOKS:

1. Grimm Brothers. *Grimms' Fairy Tales*, Harper Collins Publishers, London, 2011.
2. Hower Edward, *The Pomegranate Princess and the Other Indian Folk Tales*, RBSA Publishers, Rajasthan.1988.
3. ParasuramanSunita. *The Panchatantra*, Jaico Publishing House, Mumbai, 2011.
4. Blyton Emid. *The Brer Rabbit Collection*, Egmont, London, 2013.
5. *The Voyage of Sindbad The Sailor and Other Stories*, Indiana Publishing House, New Delhi, 2010.
6. Aesop. *Aesop's Fables*, Maple Press Private Limited, India 2016.

REFERENCE BOOKS:

1. Hunt Peter. *An Introduction to Children's Literature*, Oxford University Press, Oxford, 1996.
2. Pullman Philip, *Grimms Tales for Young and Old*, Penguin Books, New York, 2012.
3. Ed. by Kalu C Anthonia. *Anthology of African Literature*, Lynne Rienner Publisher Inc., Colorado, 2008.
4. Bloom Harold, *Critical Interpretations Lewis Carroll's Alice in Wonderland*, Viva Books Private Limited, New Delhi, 2007.
5. Lear Edward. *Poems and Limericks of Edward Lear*, Florida Center for Instructional Technology, Florida, 2012.
6. Srinivasan Prema, *Children's Fiction in English in India: Trends and Motifs*, T.R.Publications, 1988.

JOURNALS:

1. International Journal of English and Literature (IJEL)
2. Journal of English and Literature (JEL – TJPRC)

E-LEARNING RESOURCES:

1. <https://www.bl.uk/romantics-and-victorians/articles/the-origins-of-childrens-literature>
2. <https://www.orwellfoundation.com/the-orwell-foundation/orwell/essays-and-other-works/nonsense-poetry/>
3. <http://kinooze.com/how-are-fables-different-from-fairytales/>
4. <https://www.sas.upenn.edu/folklore/faculty/dbamos/TIOF.html>
5. <https://www.fantasticfiction.com/b/enid-blyton/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Identify the key elements of Children's Literature.
CO 2	Distinguish between early forms and latest forms of Children's Literature.
CO 3	Illustrate Children's Literature.
CO 4	Dramatize children's stories.
CO 5	Review Children's Literature as source of entertainment.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	1	3	3
CO4	3	3	1	3	3
CO5	3	2	3	3	3
AVERAGE	3	2.8	2.2	3	3

KEY: **STRONGLY** CORRELATED-3 **MODERATELY** CORRELATED-2 **WEAKLY** CORRELATED-1
NO CORRELATION-0

I B.A. SEMESTER – I

SOCIO-CULTURAL HISTORY OF ENGLAND

TOTAL HOURS: 6 (90 Hours)

COURSE CODE: 171591

CREDITS: 5

COURSE OBJECTIVES:

1. To introduce the students to the socio-cultural history of England.
2. To familiarize them with the revolutions, wars and growth of England.
3. To make them understand the impact of calamities that affected the English society and their welfare schemes.

COURSE OUTLINE:

UNIT I

Hours:18

- The Renaissance and Reformation
- Colonial Expansion
- Puritanism

UNIT II

Hours:18

- Restoration England
- Great Plague
- Great Fire
- Age of Queen Anne
- Coffee House Life in London

UNIT III

Hours:18

- The Agrarian Revolution
- The Industrial Revolution
- The American War of Independence
- Effects of the French Revolution

UNIT IV

Hours:18

- The Reform Bills
- Victorian Age
- Development of Education in Victorian England

UNIT V

Hours:18

- The Two World Wars - Life between the Two World Wars - Effects of the Second World War
- Effects of the Cold War
- Life in late 20th century (inclusive of 60th to 90th)

RECOMMENDED TEXTBOOKS:

1. A.G.Xavier. *An Introduction to the Social History of England*, S. Viswanathan(Printer&Publishers)Pvt.Ltd.2005
2. Ashok Padmaja. *The Social History of England*, Angel Publishing House,Chennai.1994.

REFERENCE BOOKS:

1. G.M.Trevelyan. *English Social History*, Surjeeth Publications, New Delhi.2011
2. Asa Briggs. *A Social History of England*, Penguin Books,1986.
3. Bibhash Choudhury. *English Social and Cultural History – An introductory Guide and Glossary*,Prentice Hall India Learning Private Limited.2005
4. R.D.Trivedi. *A Compendious History of English Literature*, Vikas Publishing House Pvt.Ltd.,New Delhi.2003
5. A.Shanmugakani. *An Introduction to the Social History of England*, Manimekala Publishing House, Madurai.2010.

JOURNALS:

1. Journal of Social History – Societies and Cultures
2. Cultural and Social History – The Journal of the Social History Society

E-LEARNING RESOURCES:

1. <https://www.cambridge.org/core/series/social-history-of-england>
2. <https://www.victorianweb.org/religion/puritan.html>
3. <https://www.historic-uk.com/HistoryUK/HistoryofEngland/Dissolution-of-Monastries>
4. <https://www.hoocher.com/mr.j'spage/therenaissanceandreformation.htm>
5. <https://www.yourarticlelibrary.com/essay/industrial-revolution-industrial-revolution-in-england-and-europe/33003>

COURSE OUTCOMES:

CO Number	CO STATEMENT

CO 1	Define social, political, economic and cultural history of England
CO 2	Describe major events and individuals associated with the history of England
CO 3	Analyze the impact of calamities that affected the English society
CO 4	Understand the ethos of Britain
CO 5	Discuss the transformation happened in the English society

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	2
CO2	2	3	3	3	2
CO3	3	3	2	2	3
CO4	3	3	3	3	3
CO5	3	3	2	3	2
AVERAGE	2.8	3	2.4	2.6	2.4

KEY: **STRONGLY** CORELATED-3 **MODERATELY** CORELATED-2 **WEAKLY** CORELATED-1 **NO** CORELATION-0

I B.A. SEMESTER – I

VOCABULARY EXTENSION AND ETIQUETTE
(Non-Major Elective-I)

COURSE CODE:17151

COURSE OBJECTIVES:

1. To enhance the students vocabulary skills.
2. To sensitize the students to various etiquettes.
3. To expose frequently used idioms and phrases.

UNIT I **Hours: 6**

Antonyms and Synonyms

Nominal Compounds

Homonyms

Homophones

Collective Noun/Group terms

Oxymoron

Idioms and Phrases

Definition of Etiquette

Personal Etiquette

Business Etiquette

Telephone Etiquette

E-mail Etiquette

Dining Etiquette

RECOMMENDED TEXTBOOKS:

1. V.Saraswathi, Maya K. Mudbhalkar. *English for Competitive Examinations*, Emerald Publishers, Chennai. 2005
2. Raj N. Bakshi. *English Grammar Practice*, Orient Blackswan Private Limited, Hyderabad. 2009

REFERENCE BOOKS:

1. Nimeran Sahakar, Prem P. Bhalia, *The Book of Etiquette and Manners*, Pustak Mahal,
2. V. Ayothi & R. Vedavalli. *English for Competitive Examinations*, New Century Book House (P) Ltd., Chennai. 2001
3. R. P. Bhatnagar, Raghu Bhargava, *English for Competitive Examinations*, Macmillan India Limited. 2006
4. Michael McCarthy, Felicity O'Dell. *English Vocabulary in Use*, Cambridge University Press, New York. 2002
5. *Idioms are Fun*, Wilco Publishing House, Mumbai. 2006

JOURNALS:

1. Journal of English Language and Literature
2. JTLS – Journal of Teaching Language Skills

E-LEARNING RESOURCES:

1. <https://edu.gcfglobal.org/en/jobssuccess/business-etiquette/1/>
2. <https://www.toppr.com/guides/english/vocabulary/idioms-and-phrases/>
3. <https://www.managementstudyguide.com/telephone-etiquettes.htm>
4. <https://www.vocabulary.com/lists/204064>
5. <https://www.thespruce.com/table-manners-and-dining-etiquette-1216971>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Use wide range of words in oral and written communication
CO 2	Understand rules of conduct that develops their personality
CO 3	Use idioms and phrases in day to day conversation

CO 4	Communicate effectively over telephone
CO 5	Acquire an extensive vocabulary

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	3	2	3
CO4	2	3	3	2	3
CO5	2	3	3	2	2
AVERAGE	2.6	3	3	2	2.8

KEY: **STRONGLY** CORELATED-3 **MODERATELY** CORELATED-2 **WEAKLY** CORELATED-1 **NO** CORELATION-0

I B.A. SEMESTER –I

ESSENTIAL SOCIAL SKILLS-I

TOTAL HOURS: 2 [30 Hours]
179001

COURSE CODE:

CREDITS: 2

COURSE OBJECTIVES:

1. To enable the students to hone their listening
2. To enable the students to acquire learning skills.
3. To empower the students with team work skills.
4. To empower the students with Emotional Intelligence Skills
5. To empower the students with Assertive skills

COURSE OUTLINE:

UNITS	UNIT DESCRIPTION	Total HOURS
Unit I- Listening Skills	Introduction (1 hr) Teaching of the concepts of Listening Skills (2 hrs) Activities to practice good listening skills (2 hr) Discussion on Listening Skills (1 hr)	5 hrs
Unit II- Teamwork Skills	Introduction (1 hr) Teaching of the concepts of Teamwork Skills (2 hrs) Activities to practice Teamwork skills (1 hr) Discussion on Teamwork Skills (1 hr)	5 hrs
Unit III- Emotional Intelligence Skills	Introduction (1 hr) Teaching of the concepts of Emotional Skills (2 hrs) Activities on developing Emotional skills (1 hr) Discussion on Emotional Skills (1 hr)	5 hrs
Unit IV- Assertive Skills	Introduction (1 hr) Teaching of the concepts of Assertive Skills (2 hrs) Activities to practice Assertive skills (1 hr) Discussion on Assertive Skills (1 hr)	5 hrs
Unit V- Learning Skills	Introduction (1 hr) Teaching of the concepts of Learning Skills (2 hrs) Activities to practice good Learning skills (1 hr) Discussion on Learning Skills (1 hr)	5 hrs
Revision	Revision of all the units (5 hrs)	5 hrs

Recommended Books

1. Dhanavel S.P., *English and soft-skills*
2. Alex, K. *Soft Skills Know Yourself & Know The world*. S. Chand & Company PVT. LTD, 2014.

Reference books

1. Ramesh, Gopalaswamy& Ramesh, Mahadevan ,*The ACE of soft skills: Attitude, Communication and Etiquette for success*.Pearson,2010.
2. Amy Cuddy, *Presence: Bringing Your Boldest Self to Your Biggest Challenges*.
3. Tulgan, Bruce. *Bridging the soft-skills Gap*, John Wiley & Sons. 2015.
4. Mitra, Barun. *Personality Development and Soft Skills*, OUP, 2016.
5. Bhatnagar Nitin & Bhatnagar, Mamta. *Effective Communication and Soft-Skills-Strategies for Success*. Pearson, 2012.

Journals

1. <https://www.trainingjournal.com/tags/soft-skills>
2. <https://thejournalofbusiness.org/index.php/site/article/view/1052>

E-Resources

1. <https://www.thebalancecareers.com/list-of-soft-skills-2063770>
2. <https://www.mbopartners.com/blog/how-manage-small-buisness/why-are-soft-skills-important/>
3. <https://www.wikijob.co.uk/content/interview.advice/competencies/soft-skills>
4. <https://elearningindustry.com/soft-skills-in-the-workplace-develop-train>
5. <https://www.proschoolonline.com/blog/soft-skills-development>
6. https://corporatetrainingmaterials.com/course/Emotional_Intelligence?gclid=EAlaIQobChMIubP65e3h5AIVDCQrCh14yglcEAAYASAAEgl8yvD_BwE

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	The students will know how to be an active listener.
CO 2	The students will be able to “Learn, unlearn and relearn”
CO 3	The students will be good team players.
CO 4	The students will be assertive in real life situations
CO 5	The students will possess high Emotional Intelligence

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	0	2	3
CO2	3	2	0	2	3
CO3	3	2	0	2	3
CO4	3	2	0	2	3
CO5	3	2	0	2	3
AVERAGE	15	10	0	10	15

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER II

SEMESTER – II

Core	British Poetry
	Indian Writing In English
Allied	Literary Genres And Terms
NME - II	Writing Skills

Soft-Skills-II	Essential Social Skills – II

I BA – SEMESTER-II

BRITISH POETRY

TOTAL HOURS: 5 [75 Hours]

COURSE CODE:171503

CREDITS: 4

COURSE OBJECTIVES:

1. To introduce the most famous British poets
2. To acquaint students to various aspects of poetry.
3. To familiarize representative poetry of eminent authors.

COURSE OUTLINE:

UNIT I

Hours:15

Edmund Spenser : Faerie Queene (Book I upto canto 3)

UNIT II

Hours:15

John Donne : The Triple Fool
 John Milton : On his Blindness
 John Dryden : A Song for St. Cecilia's Day

UNIT III

Hours:15

Thomas Gray	:	Elegy Written in the Country Churchyard
William Wordsworth	:	Daffodils
Percy Bysshe Shelley	:	Ode to a Skylark
John Keats	:	La Belle Dame Sans Merci

UNIT IV

Hours: 15

Alfred Lord Tennyson	:	The Charge of the Light Brigade
Robert Browning	:	Porphyria's Lover
Matthew Arnold	:	Austerity of Poetry

UNIT V

Hours:15

William Butler Yeats	:	The Second Coming
T. S. Eliot	:	The Hippopotamus
Wilfred Owen	:	Anthem for Doomed Youth
Ted Hughes	:	Crow and Mama
Philip Larkin	:	Love Songs in Age

RECOMMENDED TEXTBOOKS:

1. Ed. by Thomas C T. *Chaucer to Housman Vol. 1 & 2*, B.I.Publications, Madras, 1987.
2. Ed. by Thomas C T. *Chaucer to Housman Vol. 1 & 2*, B.I.Publications, Madras, 1990.
3. Green David. *The Winged Word*, Macmillan Publishers India Limited., 2009.

REFERENCE BOOKS:

1. Schmidt Michael. *British Poets 1300-1900*, Pan Books, London, 1979.
2. Boulton Marjorie. *The Anatomy of Poetry*, Routledge & Kegan Paul Ltd., London, 1953.
3. Bradley A.C. *Oxford Lectures on Poetry*, Macmillan & Co.Ltd., London, 1955
4. Kermode Frank. *The Oxford Anthology of English Literature Vol.2*, Oxford University Press, New York, 1980.
5. Evans Maurice. *English Poetry in the 16th Century*, Hutchinson's University Library, 1955.

JOURNALS:

International Journal of Science Arts and Commerce (IJSAC)

Hind Litt.A Journal of Literary and Critical Studies.

E-LEARNING RESOURCES:

1. <https://www.ukessays.com/essays/literature/thematic-analysis-of-faerie-queene-literature-essay.php>
2. <https://poets.org/text/brief-guide-metaphysical-poets>
3. <https://www.mariahecarter.com/>
4. <https://www.sic-journal.org/ArticleView.aspx?aid=148>
5. <https://www.nytimes.com/2007/02/12/opinion/12mon4.html>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand the various aspects of poetry.
CO 2	Identify various poetic devices.
CO 3	Appreciate the language and its connotations and denotations.
CO 4	Demonstrate dramatic monologue.
CO 5	Perform poetry reading.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	1	1	2	2	3
CO3	3	3	2	3	3
CO4	3	2	3	2	3
CO5	3	1	2	1	3
AVERAGE	2.6	2	2.4	2	3

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORRELATION-0

I BA – SEMESTER-II**INDIAN WRITING IN ENGLISH**

TOTAL HOURS: 5 [75 Hours]

COURSE CODE:171504

CREDITS: 4

COURSE OBJECTIVES:

1. To introduce English literature of Indian writers.
2. To familiarize various genres of Indian writing.
3. To showcase Indianness in the works of famous Indian authors.

COURSE OUTLINE:

UNIT I: PROSE Hours: 15

Mahatma Gandhi	:	Voluntary Poverty
Jawaharlal Nehru	:	A Birthday Letter
A.Parthathasarathy	:	Way to Success
NiradC.Chaudhuri	:	A Labour of Love

UNIT II: POETRY Hours: 15

Aurobindo	:	Rose of God
Sarojini Naidu	:	The Queen's Rival
A.K. Ramanujam	:	A River
Nissim Ezekiel	:	Woman and Child
Toru Dutt	:	Our Casuarina Tree
Kamala Das	:	The Old Play House

UNIT III: DRAMA Hours: 15

GirishKarnad	:	The Fire and the Rain

UNIT IV: SHORT STORY Hours: 15

Rabindranath Tagore	:	Subha
R .K .Narayan	:	A Horse and Two Goats

UNIT V: FICTION Hours: 15

Mulk Raj Anand	:	Two Leaves and a Bud

RECOMMENDED TEXTBOOKS:

1. Karnad Girish. *Collected plays. Volume Two*. Oxford University Press, New Delhi, 2008.
2. Parthasarathy A. *Vedanta Treatise*, Ajanta Offset &Packagings Limited, New Delhi, 2012.
3. Nehru Jawaharlal. *Glimpses of World History*, Penguin Books, New Delhi, 2004.

4. Board of Editors. *An Anthology of Indian English Poetry*, Orient Longman, 1989.
5. Srinivasalyengar K.R. *Indian Writing in English*, Sterling Publishers Private Ltd., New Delhi, 1962.

REFERENCE BOOKS:

1. Rajyalakshmi P.V. *The Lyric Spring: The Poetic Achievement of Sarojini Naidu*, Abhinav Publications, New Delhi, 1977.
2. Ramamurti K.S. *Twenty – Five Indian Poets in English*, Macmillan India Ltd., Bangalore, 1995.
3. Gandhi M.K. *Selected Works of Mahatma Gandhi Vol. 4*
4. Naik M.K. *A History of Indian English Literature*, SahityaAkademi, New Delhi, 1982.
5. K.R.Srinivasalyengar. *Rabindranath Tagore A Critical Introduction*, Sterling Publishers Private Ltd., New Delhi, 1965.
6. Kundu Rama. *Indian Writing in English*, Atlantic Publisher & Distributors, New Delhi, 2003.
7. Venkata Reddy K. *Major Indian Novelists*. Prestige Books, New Delhi, 1990.

JOURNALS:

The Journal of Indian Writing in English

Literary Herald: International Journal of English and Literature

E-LEARNING RESOURCES:

1. https://www.academia.edu › Voluntary_Simplicity_and_Voluntary_Povert..
2. <https://www.boloji.com/articles/49813/contemporary-indian-english-poetry>
3. https://www.academia.edu/20219506/Tagores_Chandalika_as_a_social_drama
4. <http://www.languageinindia.com/march2010/gunanarrative.pdf>
5. <http://www.languageinindia.com/aug2014/sulochanatwoleavesfinal.pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Identify and English literature of Indian Writers
CO 2	Define various genres of Indian Writing.

CO 3	Understand and Appreciate Indianness in the works of Indian authors.
CO 4	Compare the writing style of Indian writers in English with other writers.
CO 5	Analyse the timeless themes of Indian Literature.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	2	2	3	3
CO5	3	3	3	3	3
AVERAGE	3	2.8	2.8	3	3

KEY: **STRONGLY** CORRELATED-3 **MODERATELY** CORRELATED-2 **WEAKLY** CORRELATED-1
NO CORRELATION-0

BA – SEMESTER-II

LITERARY GENRES AND TERMS

TOTAL HOURS: 6 [90 Hours]

COURSE CODE: 171592

CREDITS: 5

COURSE OBJECTIVES:

1. To introduce various literary genres.
2. To familiarize the most important literary terms
3. To appreciate literary texts with the help of the literary terms.

COURSE OUTLINE:

UNIT I: PROSE

Hours: 18

Origin of the Essay – The Aphoristic Essay – The Periodical Essay – The Social Essay – Biography and Autobiography – Travelogue - Criticism and Kinds of Criticism

UNIT II: POETRY

Hours: 18

Subjective and Objective Poetry – The Ode – The Sonnet – The Elegy – The Ballad – The Idyll – The Epic – The Satire - Dramatic Monologue.

UNIT III: DRAMA

Hours: 18

The Tragedy – The Comedy – The Tragi-comedy –The Farce -The Masque - The One-act Play - The Absurd Drama –

UNIT IV: FICTION

Hours: 18

The Short-story – The Novel – The Historical Novel – The Picaresque Novel –The Regional Novel - The Epistolary Novel – The Gothic Novel – The Detective Novel – Bildungsroman - The Science Fiction – Stream of Consciousness.

UNIT V: LITERARY TERMS

Hours: 18

Metaphor – Simile – Hyperbole – Onomatopoeia – Assonance – Alliteration – Blank Verse – Free Verse - Allegory – Heroic Couplet – Epithet – Paradox – Pathos – Chorus - The Three Unities – Dramatic Irony – Climax – Anti-climax – Catastrophe – Denouement – Aside – Soliloquy

RECOMMENDED TEXTBOOKS:

1. B.Prasad. *A Background to the Study of English Literature*, Macmillan, New Delhi. 2013
2. M.H.Abrams. *A Glossary of Literary Terms*, Macmillan India Limited, Delhi. 1978

REFERENCE BOOKS:

1. R.J.Rees. *English Literature – An Introduction for Foreign Readers*, Macmillan India Limited, New Delhi. 1973
2. J.A.Cuddon. *A Dictionary of Literary Terms*, Penguin Books, England. 1977
3. Baldic, Chris. *Oxford Dictionary of Literary Terms*, OUP, New York. 2001
4. Turco, Lewis. *The Book of Literary Terms*, University Press of New England, 1999
5. Nitish Kumar Basu. *Introducing Some Literary Types*, Indian Books View, Delhi. 1999

JOURNALS:

1. Langlit – An International Peer-Reviewed open Access Journal
2. Literary Endeavour- An International Journal of English Language, Literature and Criticism

E-LEARNING RESOURCES:

1. <https://literarydevices.net/genre/>
2. <https://study.com/academy/lesson/literarygenres-definition-types-characteristics-examples.html>
3. <https://www.cde.ca.gov/ci/cr/rl/litrlgenres.asp>
4. <https://literaryterms.net>
5. <https://www.rfwp.com.pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Define various literary terms
CO 2	Identify the different forms of novel
CO 3	Apply the acquired knowledge for other literary papers by writing different kinds of essays
CO 4	Appreciate the essence of poetry
CO 5	Analyse the various techniques of drama

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	2.8	3	3	3	3

KEY: **STRONGLY** CORELATED-3 **MODERATELY** CORELATED-2 **WEAKLY** CORELATED-1 **NO** CORELATION-0

I B.A. SEMESTER – II

WRITING SKILLS (Non-Major Elective-II)

TOTAL HOURS: 2 [30 Hours]

COURSE CODE:17152

CREDITS: 2

COURSE OBJECTIVES:

4. To enable the students to hone their writing skills.
5. To expose them to various types of technical writing.
6. To teach note-making to enhance their learning skills.

COURSE OUTLINE:

UNIT I: Guided Writing

Hours: 6

Developing the hints

Arranging the sentences - cohesion

UNIT II: Paragraph Writing

Hours: 6

Essentials of a good paragraph

Ordering the materials of a paragraph

Proverb Expansion

UNIT III: Essay Writing

Hours: 6

Essential aspects of an essay

Types of essays – Exposition, Description, Narration and Argumentation

UNIT IV: Letter Writing

Hours: 6

Introduction to Formal and Informal Letters

Business Letters – Asking for quotation, Placing an order and complaint letter

Job Application and Resume Writing

UNIT V: Note-Making

Hours: 6

Significance of note-making

Condensing information

Format of making notes

RECOMMENDED TEXTBOOKS:

1. G.Radhakrishnan Pillai, K.Rajeevan&P.Bhaskaran Nair.*Written English for You*, Emerald Publishers, Madras.1990
2. R.P.Bhatnagar,Raghul Bhargava, *English for Competitive Examinations*, Macmillan India Limited.2006

REFERENCE BOOKS:

1. Bikram Das, *Functional Grammar and Spoken and Written Communication in English*, Orient Black Swan Private Limited, Kolkata.2015
2. *Communicative Skills in English*, OUP, Madras.1999
- 3.G.Radhakrishnan Pillai. *English for Success*, Emerald Publishers, Chennai.2003
4. V.Syamala. *Effective English Communication for You*, Emerald Publishers, Madras, 2002
5. William Zinsser. *On Writing Well*, HarperCollins, 2006

JOURNALS:

1. Journal of Communication
2. Language and Communication – An Interdisciplinary Journal

E-LEARNING RESOURCES:

1. <https://www.english-for-students.com/Developing-Hints.html>
2. <https://studylib.net/doc/7735771/proverbs-with-explanation>
3. https://www.internationalstudent.com/essay_writing/essay_tips/
4. <https://www.successcds.net/learn-english/writing-skills/letter-writing-format-formal-letter-informal-letter-samples-topics.html>
5. <https://www.toppr.com/guides/business-correspondence-and-reporting/note-making/styles/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Write a good essay
CO 2	Draft formal letters and resume
CO 3	Equipped to write a coherent paragraph
CO 4	Apply note-making skills in the learning process
CO 5	Well prepared to write a properly structured essay

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	3	2	3
CO4	2	3	3	2	3
CO5	2	3	3	2	2
AVERAGE	2.6	3	3	2	2.8

KEY: **STRONGLY** CORELATED-3 **MODERATELY** CORELATED-2**WEAKLY** CORELATED-1 **NO** CORELATION-0

I B.A. SEMESTER - II
ESSENTIAL SOCIAL SKILLS-II

TOTAL HOURS: 30

COURSE CODE: 179002

CREDITS: 2

COURSE OBJECTIVES:

1. To enable students to learn to solve real life problems.
2. To enable students face interview confidently.
3. To teach students how to adopt to the work environment.
4. To empower students with Non-Verbal Communication Skills
5. To empower students with skills of written communication.

COURSE OUTLINE:

UNITS	UNIT DESCRIPTION	Total HOURS
Unit I- Problem Solving Skills	Introduction (1 hr) Teaching of the concepts of Problem Solving Skills (2 hrs) Activities to practice good Problem Solving Skills (2hr) Discussion on Problem Solving Skills (1hr)	5 hrs
Unit II- Interview Skills	Introduction (1 hr) Teaching of the concepts of Teamwork Skills (2 hrs) Activities to practice Teamwork skills (1 hr) Discussion on Teamwork Skills (1 hr)	5 hrs
Unit III- Adaptability Skills	Introduction (1 hr) Teaching of the concepts of Adaptability Skills (2 hrs) Activities on developing Adaptability skills (1 hr) Discussion on Adaptability Skills (1 hr)	5 hrs
Unit IV- Non-Verbal communication Skills	Introduction (1 hr) Teaching of the concepts of Non-Verbal communication Skills (2 hrs) Activities to practice Non-Verbal communication skills (1 hr) Discussion on Non-Verbal communication Skills (1 hr)	5 hrs

Unit V- Written Communication Skills	Introduction (1 hr) Teaching of the concepts of Written Communication Skills (2 hrs) Activities to practice good Written Communication (1 hr) Discussion on Written Communication Skills (1 hr)	5 hrs
Revision	Revision of all the units (5 hrs)	5 hrs

Recommended Books

1. Dhanavel S.P., *English and soft-skills*
2. Alex, K. *Soft Skills Know Yourself & Know The world*. S. Chand & Company PVT. LTD, 2014.

Reference books

1. Ramesh, Gopalaswamy & Ramesh, Mahadevan, *The ACE of soft skills: Attitude, Communication and Etiquette for success*. Pearson, 2010.
2. Amy Cuddy, *Presence: Bringing Your Boldest Self to Your Biggest Challenges*.
3. Tulgan, Bruce. *Bridging the soft-skills Gap*, John Wiley & Sons. 2015.
4. Mitra, Barun. *Personality Development and Soft Skills*, OUP, 2016.
5. Bhatnagar Nitin & Bhatnagar, Mamta. *Effective Communication and Soft-Skills- Strategies for Success*. Pearson, 2012.

Journals

1. <https://www.trainingjournal.com/tags/soft-skills>
2. <https://thejournalofbusiness.org/index.php/site/article/view/1052>

E-Resources

1. <https://www.thebalancecareers.com/list-of-soft-skills-2063770>
2. <https://www.mbopartners.com/blog/how-manage-small-buisness/why-are-soft-skills-important/>
3. <https://www.wikijob.co.uk/content/interview.advice/competencies/soft-skills>
4. <https://elearningindustry.com/soft-skills-in-the-workplace-develop-train>
5. <https://www.proschoolonline.com/blog/soft-skills-development>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Students will be able to solve problems at workplace and in real life.
CO 2	Students will face interview confidently
CO 3	Students will be more adoptive in the workplace.

CO 4	Students will be able to communicate effective through non-verbal in the workplace.
CO 5	Students will be able to effectively communicate through writing.

SEMESTER III

SEMESTER – III

Core	British Literature Drama & Fiction
	American Literature I
Allied	History Of English Literature

Soft-Skills-III	Personality Enrichment
EVS	Environmental Studies

II B.A. SEMESTER - III

BRITISH LITERATURE –DRAMA & FICTION

TOTAL HOURS: 5 [75 Hours]

COURSE CODE: 171505

CREDITS: 4

COURSE OBJECTIVES:

- 1.To facilitate the students to analyze the novels of the British writers.

2. To discuss the emergence and development of the British drama and fiction in the light of avant-garde movements, mass culture, and theories.
3. To impel a genuine enthusiasm for theatre at its most thought-provoking dramatics.

COURSE OUTLINE:

Unit I :

Hours: 15

Excerpts from Allardyce Nicoll: The History of British Drama: Chapter IV. Comedies of

Manners

Unit II : Drama

Hours: 15

Marlowe	:	The Jew of Malta
Ben Jonson	:	Volpone
T.S.Eliot	:	The Confidential Clerk

One- Act Plays

J.M.Synge	:	Riders to the Sea
G.B.Shaw	:	The Fascinating Foundling

Unit III Fiction

Hours: 15

Daniel Defoe	:	Journal of the Plague Year:
Henry fielding	:	Tom Jones
Jane Austen	:	Pride & Prejudice

Unit IV: Novella

Hours: 15

AphraBehn	:	Oroonoka or the Royal Slave
Charles Dickens:		A Christmas Carol

Unit V Short Stories

Hours: 15

Walter Scott	:	My Aunt Margaret's Mirror
Hardy	:	Three Strangers
D.H.Lawrence	:	The Rocking Horse Winner
Thackeray	:	The Painter's Bargain

RECOMMENDED TEXTBOOKS:

Defoe,D. : Journal of the Plague Year (1722; Penguin, 1986)

Aphra : Oroonoko. New York: Norton& Company, 1997.

REFERENCE BOOKS:

Lodge, David, The Art of Fiction. Penguin Random House, 2011

Chapman & Hall, A Christmas carol, Penguin House, New York: 1984

Benn, Aphra, Oroonoko. New York : Norton& Company,1997

Barnes M. Charles & Barnes. William and Noble. Clifford, Background. Origin and Development of British Drama, New York:1886

JOURNALS:

IJELLH – International Journal of English Language, Literature and Humanities

Volume III Issue / March 2015 – ISSN 2321-7065

www.ijindex.org

E-LEARNING RESOURCES:

<https://www.rssc.org.uk>tamburlaine>

<https://www.usatoday.com>books>

pierre-marteau.com>e-1688-0002

<https://almabooks.com>pr...>

<https://americanliterature.com>author>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	To facilitate the students for a background study of British Drama & Fiction
CO 2	To prepare the students to appreciate the nuances of verses, and dialogues in the drama as wells one act plays
CO 3	To help students Analyse the novels of the British writers
CO 4	To familiarize the genre form novella
CO 5	Genuine create interest for storytelling and to read short stories

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	3	3	3	3	3

CO3	3	3	3	3	2
CO4	2	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	2.8	2.8	3	3	2.8

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORRELATION-0

II B.A. SEMESTER – III

AMERICAN LITERATURE I

TOTAL HOURS: 4 (60 Hours)

COURSE CODE: 171506

CREDITS: 4

COURSE OBJECTIVES:

1. To bring familiarity with concepts relevant to the early American literature.
2. To introduce various literary approaches and techniques employed by writers from Colonial, Early National, and Antebellum periods.
- 3.A close reading of the text would make them attentive to the stylistic aspects of the texts

COURSE OUTLINE:

Unit I : The Literary Background and trends

Hours: 10

America's Beginning – Colonial period- -Romanticism- Naturalism- -
Humanitarianism-Transcendentalism

Unit II Prose

Hours: 12

Cotton Mather : The Wonder of the Invisible World - Ch 9 and 10
Williom Bradford : Of Plymouth Plantation
Thomas Jefferson : Declaration of Independence
Abraham Lincoln : II Inaugural Address

Unit III : Poetry

Hours: 13

Emerson	:	The Mountain
H. Longfellow	:	Song of Hiawatha
W. C. Bryant	:	Oh Mother of a Mighty Race
Whitman	:	When the Lilacs last in the dooryard Bloom'd
Langston Hughes	:	Dream
Emily Dickinson	:	The Soul Selects hers own Society
Sylvia Plath	:	The Lady Lazarus
Laurence Dunbar	:	We Wear the Mask

Unit IV: Fiction

Hours: 13

H.B. Stowe	:	Uncle Tom's Cabin

Unit IV : Drama

Dion Boucicault	:	The Octoroon

Unit V American Folklore- Fables & Fairy Tales`

Hours: 12

Bloody Mary
The Indian Cinderella

RECOMMENDED TEXTBOOKS:

American Literature – An Anthology of Poems – Ed., C. Subbian

American Literature : Norton Anthology Boston *Houghton Mifflin Co.* 1968

REFERENCE BOOKS:

Stowe, Harriet Beecher, 1811-1896, Uncle Tom's cabin. London : J. cassell, 1852

Boucicault, Dion. United stated: Jan 9, 1909

Brjant W.C modern Language Notes. The John Hopkis University Press: pp180-182, Vol.32, March 1917.

JOURNALS:

Uncle Tom's Cabin – <http://academic.oup.com/jah/article-abstract>

American folklore – <https://www.press.wilinois.edu/journals/jaf>

E-LEARNING RESOURCES:

<https://www.encyclopedia.com>

<https://www.jstor.org/stable>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	To provide an insight about the various trends and monuments in American Literature and thereby developing better understand thereby developing better understand
CO 2	To entertain prose reading and speeches would improve their skills and to trace the different prose styles of the authors
CO 3	The collection of poems gives a versatile picture of the life and reflection of thought of the writer which the students appreciates and analyse
CO 4	The problem discussed through the drama would teach tell her the solo-political context of American understand through literariness
CO 5	To trace the them memories, and origin and ethnic details of the people through their tables and fairy tales would help their understand the periods.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	2
CO2	3	3	3	3	3
CO3	3	3	2	3	3
CO4	3	3	3	2	3
CO5	2	3	2	3	3
AVERAGE	2.8	3	2.6	2.8	2.8

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

II B.A. SEMESTER – III

HISTORY OF ENGLISH LITERATURE –I

TOTAL HOURS: 5 (75 Hours)

COURSE CODE: 171593

CREDITS: 5

COURSE OBJECTIVES:

1. To expose the students to various periods in the growth of English literature
2. To make them observe the influence of the individual writer upon the age and vice versa
3. To train them to trace the relationship between the writers who precede or succeed the other.

COURSE OUTLINE:

Unit I :Age of Chaucer

Hours: 20

Influence of the French language – Romaunt of the Rose – Chaucer- the father of English poetry- The Canter bury Tales – William Langland- William Dunbar – Prose in the Age of Chaucer- Thomas More’s Utopia-John Wycliff’s (trans) bible- Thomas Malory’s Mort d Arthur.

Unit II :Development of Drama

Hours: 15

Mystery play, Moralities, Interludes.-The first comedy and the first tragedy - The University wits – Kyd – Marlowe –Webster- Thomas Middleton- Ben Johnson.

Unit III : Elizabethan Age

Hours: 10

Introduction of sonnet from Italy- Wyatt-Surrey-Howard.— Edmund Spenser- Faerie Queen-Prothalamion-Epithalamion- Philip Sydney -Elizabethan stage- Shakespeare- Francis Bacon .

Unit IV : Age of Milton

Hours:

20

Cavalier poets- Herrick-Lovelace- Donne and the Metaphysical school of poetry,- Andrew Marvell, Vaughan, Crashaw -Milton’sPoetry- Prose-James I Authorized version of Bible – The Diarists – Samuel Pepys- – Addison- Richard Steele- Defoe-Swift- Dryden-Wycherly-Congreve.

Unit V :Age of Pope

Hours: 10

The Age of Enlightenment-Alexander Pope- William Cowper, Blake, Robert Burns- Samuel Richardson – Henry Fielding -Smollet- Samuel Johnson- Boswell – Goldsmith-Sheridan.

RECOMMENDED TEXTBOOKS:

Hudson .W.H : An Outline History of English Literature

B. Prasad : History of English Literature

REFERENCE BOOKS:

Iyengar, K.R. Srinivasa ,Prem Nanda kumar. Introduction to the study of English Literature .

New Delhi : Safdarjang Enclave 1966

Stephen , Martin : Longman Exam Guides –English Literature .London: Longman Group

Ltd ,1986

A.C. Ward, 20th Century English Literature 1901-1960 .B.I.Publications London :Methuen

and Co 1974

Bennett , Robert A .English Literature Ginn Literature Series Ginn and Company 1981

Sherburne , George and Donald F.Bond . The Restoration and the 18th Century london :

Routledge 1972

JOURNALS:

Biester ,James. “A Pleasant and Terrible Reverence”.maintanance of Majesty in Sydney;

“New Arcadia” Publication : Philological Quarterly . Vol.72 ,No.4 –Fall 1993 .

Evans , James .” The dullissimo macaroni” . Masculities in she Stoops to Conquer .

Philological Quarterly . Vol.90.No.1 Winter 2011

E-LEARNING RESOURCES:

Info@psupress.org

<http://www.questia.com/liberay/journal/igi-15715326/>

<http://www.litencyc.com/php/sworks.php?rec=true&uid=468>,accessed 20 sep 2019

www.academia.edu/361715

www.questia.com/library/journal/igi-306971754

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	To explore the outline knowledge of history of England
CO 2	To Introduce features and types of drama during period
CO 3	To appreciate the poetry , figure of speech , and the meter and rhyme of sonnets
CO 4	To understand the features of Cavalier poets and the stylistic aspects of Addison and Steele in prose
CO 5	To familiarize the students with the art of fiction, delineation of plots and characterization

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	2	3	2	3	3
CO4	3	3	3	3	3
CO5	3	3	3	2	3
AVERAGE	3	3	3	3	3

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

II B.A. SEMESTER – III

SOFT SKILLS PAPER – III

PERSONALITY ENRICHMENT

TOTAL HOURS: 2 [30 Hours]

COURSE CODE: 179003

CREDITS: 3

Unit I : Determinants of Personality and Personality Traits

- Definition of ‘Personality’
- Determinants of Personality
- Personality Traits
- Big Five Personality Traits
- Related Activities

Unit II : Understanding Self: The Johari - Window

- Introduction
- Johari-Window
- Changing the Quadrants

- Related Activities

Unit III : Coping with Self Liabilities

- Common liabilities and coping with these liabilities

Anger
Shyness
Conflicts

- Related Activities

Unit IV : Self-Discipline

- Introduction
- Key ingredients of Self-discipline
- Conclusion
- Related Activities

Unit V : Personality Manifestation

- Non-verbal communication: a powerful tool
- Types of non-verbal communication and body language
- Psychologically proven examples of body language
- Using body language and non-verbal communication successfully.
- Do's and Don'ts of body language
- Related Activities

Books for Reference:

- Aurthier John, *Personality Development*, Lotus Press, New Delhi, 2006.
- Karstein, H. *Positive Thinking for Positive Living*, Focus Books, Popular Prakashan, Mumbai, 1986.
- Khera Shiv. *You Can Win. A Step by Step Tool for Top Achievers*, Macmillan, Chennai, 1998.
- Newstrom John W. and Edward E. Scannell, *Games Trainers Play, Experiential Learning Exercises*, Tata McGraw-Hill, New Delhi, 1980.
- Newstrom John W. and Edward E. Scannell, *More Games Trainers Play*, Tata McGraw-Hill, New Delhi, 1980.
- [http://en.wikipedia.org/wiki/body language](http://en.wikipedia.org/wiki/body_language).
- <http://www.deltabravo.net/custody/body.php>.

II B.A. SEMESTER – III

ENVIRONMENTAL STUDIES

TOTAL HOURS: 2 [30 Hours]

COURSE CODE: 174001

CREDITS:

Unit I : The Multi disciplinary nature of environmental studies:

Definition, Scope of importance, Need for awareness.

Unit II : Natural Resources: Renewable and non-renewable resources:

Natural Resources and associated problems:

- Forest Resources:** User and Over – exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- Water Resources:** Use and over – utilization of surface and ground water, floods, drought, conflicts over water, dams – benefits and problems.
- Mineral Resources:** Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

- Food resources:** World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

- Energy Resources:** Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, case studies.

- Land Resource:** Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources.

Equitable use of resources for sustainable lifestyles

Unit III : Ecosystem: Concept of an ecosystem– Structure and function of an ecosystem– Procedures, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – introduction, types, characteristics features, structure and function of the following ecosystem: Forest ecosystem

- Grassland ecosystem
- Desert ecosystem
- Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Unit IV : Biodiversity and its conservation

- Introduction – Definition: genetic, species and ecosystem diversity.

- Biographical classification of India.

- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.

- Biodiversity a Global, National and Local Level.

- India as a mega – diversity nation

- Hot – spots of biodiversity

- Threats to biodiversity: habitat loss, poaching of wildlife, man & wildlife conflicts.

- Endangered and endemic species of India.

- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit V : Environmental Pollution: Definition

1. Causes, effects and control measures of

- Air pollution
- Water pollution
- Soil pollution
- Marine pollution
- Noise pollution
- Thermal pollution
- Nuclear pollution

2. Solid Waste Management: Causes, effects and control measures of urban and industrial wastes.
3. Role of an individual in prevention of pollution
4. Pollution case studies
5. Disaster management: floods, earthquake, cyclone and landslides.

Unit VI : Social Issues and the Environment

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents, and holocaust. Case studies.
- Wasteland reclamation
- Consumerism and waste products
- Air (Prevention and Control of Pollution) Act
- Water (Prevention and Control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

Unit VII : Human social Issues and the Environment

- Population growth, variation among nations.
- Population explosion – Family Welfare Programme
- Environment and human health
- Human Rights
- Value Education

- HIV / AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and human health
- Case Studies

Unit VIII : Field Work

- Visit to a local area to document environmental assets – river/forest/ grassland / hill mountain.
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural Study of common plants, insects and birds.
- Study of simple ecosystems – Pond, river, hill slopes, etc.
(Field work Equal to 5 lecture hours)

SEMESTER IV

SEMESTER – IV

Core	Prize Winning Literature
	American Literature: II
Allied	History Of English Literature
Soft-Skills-IV	Fundamentals of Information Technology
EVS	Environmental Studies

II. B.A. SEMESTER IV

Prize Winning Literature

TOTAL HOURS: 5(75 Hours)

COURSE CODE: 171507

CREDITS: 4

COURSE OBJECTIVES:

1. This paper explores the most recent literature of national or international acclamation.
2. Students interpret and analyze how the literary concern intersects and poses new inquiries of the day.
3. Students are familiarized with the various awards and its significance.

COURSE OUTLINE:

UNIT I : Pulitzer Prize

Hours:15

Seymore Topping	:	Biography of Joseph Pulitzer
Eudora Welty	:	The Optimist Daughter
Jumpa Lahiri	:	Temporary Matter
		Interpreter of Maladies
Reynolds Price	:	The Chain of Love

UNIT II : Nobel Prize

Hours:15

Sohlman Ragnam	:	Legacy of Alfred Nobel; The true story behind the Nobel Prizes
Wole Soyinka	:	Death and the King's Horsemen
Rudyard Kipling	:	Kim
Alice Munro	:	Friends of My Youth

UNIT III: Booker Prize

Hours:15

John Berger	:	Speech on accepting Booker Prize for Fiction in London
Kingly Amis	:	The Old Devils
Salman Rushdie	:	Midnight's Children
Aundhathi Roy	:	God of Small Things

UNIT IV :Jnanpith Award

Hours:15

Annapoorna Devi	:	The Promise
Sankararao Kurup	:	The Flute

UNIT V :Sahitya Academy Award

Hours:15

Amitav Ghosh	:	The Shadow Line
KaNa Subramaniam:	:	A Movement for Literature

RECOMMENDED TEXTBOOKS:

Ka.NaaSubramaniam, A movement for Literature, Sahitya Akademi (English Translation) First Published, 1998

Welty, Eudora, The Optimist's Daughter, Vintage International, Random House, 1990.

REFERENCE BOOKS:

Munro, Alice. Selected Stories :vintaq, November, 1997

Chowdhury, Indra. The First promise Ashapura Deb, orient Longmon, India, pp XIII 541,2004

Roy, Arundhati. God of Small Things : New York : harper Perennial, 1997

Rushdie, Salman, Midnight Children :Jonathancap Publication, United Kingdom, 1981

Soyinka, Wole. Death and the Kings Horseman: New York W.W. Norton and Eompany, 2002

JOURNALS:

<http://www.ijhcs.com>

<http://researchgate.net>

E-LEARNING RESOURCES:

www.academic.edu

<https://paperap.com>

<https://www.tamdfonline.com>

<https://www.gradesane.com>

<https://www.chipublib.org>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	To give knowledge about Pulitzer prize winning novel and various literary concern read
CO 2	To the Nobel prize-winning novels and the new inquiries of the day expressed though the novels
CO 3	The understanding significance of booker prize social and political the issues discussed through the novels midnight children & god of small thugs etc
CO 4	To bring in to the minds of the students the relevance of the ideas discussed in national literature

CO 5	Detailing Sahitya academy award winning writings, would inspire them to aspire for award winning writings

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	3
CO2	3	3	2	3	2
CO3	2	3	3	3	3
CO4	3	3	3	2	2
CO5	3	3	3	3	3
AVERAGE	2.8	3	2.6	2.8	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORRELATION-0

II B.A. SEMESTER – IV

AMERICAN LITERATURE: II

TOTAL HOURS: 5(75 Hours)

COURSE CODE: 171508

CREDITS: 4

COURSE OBJECTIVES:

1. To Illustrate how the .representations of gender, class, and race, are translated in the writings of the poets and novelists.
2. To portray the socio-cultural context of the settler colonies of American land and its inhabitants.

3. To pose a question in the minds of the students whether the material prosperity, intellectual and spiritual liberty, eradication of slavery are sought by the colonized.

COURSE OUTLINE:

Unit I : Introduction: Hours: 15

The Naturalist Period (1900 – 1914), The Beat Generation (1944 – 1962), The Contemporary Period (1939 – Present), Realism- Expressionism-Symbolism, Lost Generation, Imagism, Harlem Renaissance

Unit II: Prose Hours: 15

Maya Angelou : Letter to my Daughter -Ch: 1& 4
John .F. Kennedy - : Ask not what your Country can do for you

Autobiography

Richard Wright : Living Jim Crow

Unit III: Poetry Hours: 15

Langston Hughes : I too
Hart Crane : The Bridge
Robert Frost : Stopping by Woods on a Snowy Evening
Wallace Stevens : The Snow Man

Unit IV: Drama Hours: 15

O'Neill : Hairy Ape

One Act play

Tennessee Williams: Hello from Bertha

Unit V : Fiction Hours: 15

Ernest Hemingway : Farewell to Arms

Short Stories

Stephen crane :The Open boat
Mark Twain : Luck
Hawthorne : Young Goodman Brown
Melville : Bartleby the Screevener

RECOMMENDED TEXTBOOKS:

Four centuries of American Poetry-Ed., Mohan Ramanan

American Literature – An Anthology of Poems – Ed., C. Subbian

REFERENCE BOOKS:

Crane, Mitton. 50 Great Short Stories, Bantam Books, New York:1952

Chaudhurai AD – The face of illusion in american drama

Madras : the macmillan company of India limited 1979

Maini ,Singh,Darshan – The spirit of American literature

New Delhi – Sterling publishers pvt.ltd.1988

Trent , William peter field , Erskine John.Erskine , Shermanipstuart , Oren, Van,Carl. The

History of American literature.New Delhi : Anmol Publication, 1990

American literature.Boston : Houghton Mifflin Co.1968

JOURNALS:

<https://www.questia.com>

joumel.um.ac.id

<https://www.nepjol.info.CTBIJIS>

E-LEARNING RESOURCES:

<https://www.bloomsbury.com>

<https://www.britannica.com>

<https://www.sheilamalley.com>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	To introduce various literary trends and movement from the natural period to Harlem renaissance
CO 2	The genre of prose autobiography, in posing the questions of liberty eradication of slavery
CO 3	Critical appreciation of poetry discussing the issues of gender race & class
CO 4	To understand the expressionist play by reading Hairy Ape by Eugene 'O' Neill
CO 5	To give knowledge about the lost Generations experience and despondency in the postures years as depicted in the novels

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	2

CO2	3	3	3	3	2
CO3	3	2	3	3	3
CO4	2	2	3	3	3
CO5	3	3	2	3	3
AVERAGE	2.8	2.6	2.8	3	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

II B.A. SEMESTER-IV

HISTORY OF ENGLISH LITERATURE II

TOTAL HOURS: 5(75 Hours)

COURSE CODE:171594

CREDITS: 5

COURSE OBJECTIVES:

1. To apprehend English literature with its literary trends, movements and school of thought
2. To discuss the experimentation in Modern and post-modern British Literature
3. A probe into the history of literature traversing the centuries would enhance the critical thinking of the students.

COURSE OUTLINE:

Unit I : Romantic Age-1798

Hours: 15

The Romantic Revival - Wordsworth, Coleridge, Byron, Keats, Shelley, Jane Austen, Walter Scott. Essayists- Charles Lamb, Hazlitt

Unit II: Victorian Age

Hours: 15

Tennyson, Browning, Mathew Arnold, Pre-Raphaelite school, Charles Dickens, William Thackeray, The Bronte Sisters , George Eliot, Thomas Hardy, Oscar wild, Henry James, H.G. Wells, Carlyle & Ruskin.

Unit III : The Modern Age I (1900-50)**Hours: 15**

Edwardians, Georgians,(establishment poetry), War Poetry, W.B. Yeats, Ezra Pound, G.M. Hopkins, T.S. Eliot, W.H. Auden, Joseph Conrad, Virginia Woolf, George Orwell, Rudyard Kipling, J.M. Synge, Somerset Maugham, D.H. Lawrence, Samuel Beckett, G.B. Shaw,

Unit IV : The Modern Age II**Hours: 15**

William Golding, Doris Lessing, P.G. Wodehouse, Kingsley Amis, John Fowles, Movement Poets- Philip Larkin, Ted Hughes, Thom Gunn, John Osborn, Harold Pinter, Tom Stoppard.

Unit V: Movements/Trends**Hours:****15**

War Poetry, Modernism, Symbolism, Expressionism, Surrealism, Marxism, Movement poets, Absurd Drama

RECOMMENDED TEXTBOOKS:

Hudson .W.H : An Outline History of English Literature

B. Prasad : History of English Literature

REFERENCE BOOKS:

Sainisbury ,George. A History of Elizabethan Literature Chennai : MJP Publishers, 2017

Daiches ,David . A Critical History of English Literature Vol.3 London : Secker and

Warburg 1916

Sherburne , George and Donald F.Bond . The Restoration and the 18th Century London :

Routledge 1972

Greenblatt ,Stephen , The Norton Anthology Of English Literature Ninth Edition London :

New York 2012

Bennett , Robert A .English Literature Ginn Literature Series Ginn and Company 1981

JOURNALS:

Haller, Elizabeth .Guise and the Act of Concealment in Jane Eyre. Article in Bronte Studies 28(3)
:205 -213 Nov 2003

Awal , Abdul. Thematic Concerns in the Essays of Charles Lamb: A Critical Analysis . Vol 6 , issue
6 , Nov – dec 18 E-ISSN :2349 – 7300

E-LEARNING RESOURCES:

Info@psupress.org

[http://app.cul.colombia.edu:8080/ac/handle/10022/ac :p:1009](http://app.cul.colombia.edu:8080/ac/handle/10022/ac:p:1009)

<https://www.ijirmps.org/research>

<http://www.wlajournal.com>

<https://doi.org/10.3390/h7030089>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	To make the students to understand the features of Romantic age
CO 2	To expose the cultural and aristocratic society and its vanity also the extreme condition of poverty
CO 3	To enhance the knowledge of the students with inquisitiveness of modern age as reflected in the writings of T.S. Eliot, D.H Lawrence
CO 4	To expose her to the different perspective of terms and movements of the age of science
CO 5	To make the students to analyze the features of various trends such as War poetry , drama and fiction

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	2	3	3	2
CO3	3	3	3	3	3
CO4	3	3	3	2	3
CO5	2	3	3	3	3
AVERAGE	3	3	3	3	3

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORRELATION-0

II B.A. SEMESTER-IV

SOFT SKILLS PAPER – IV

NON-COMPUTER SCIENCE STUDENTS

FUNDAMENTALS OF INFORMATION TECHNOLOGY

TOTAL HOURS: 2 [30 Hours]

COURSE CODE: 179004A

CREDITS: 3

UNIT I

Computer Fundamentals: computer basics – computer Hardware – Computer Software: - System Software –Application software – Utility Software – Single user OS –Multi User OS

UNIT II

Computer Environment : Computer Peripherals – Input Devices – Secondary Storage – Hard Disk – Windows Operating System- Introduction- Features – Desktop – Windows Explorer – Organizing Files And Folders – Built-in Applications

UNIT III

MS – WORD: Creating a Document, entering text- opening, saving and closing documents- inserting, Moving, Copying text – search and replacing text – paragraph format – spell check – page views, page formats, special formats and page layouts – working with tables – printing documents.

UNIT IV

MS- EXCEL : Introduction- Worksheet - cell- range – data entry- formulae creation –fill command –insertion, deletion – cell row, column – inserting pictures, special character objects – charting and mapping – printing worksheet

UNIT V

MS POWERPOINT AND MS-ACCESS: Overview-slides-speaker notes-charts- graphs – clipart- editing, formatting text – animation, art and sound –slide show – slide sorter- introduction to access –data and information – working with data in tables – forms – designing- query- designing report

TEXT BOOK

Computer applications in business and management, Ananthi Sheshasaayee and sheshassaaye, Margham publications, 2004, REPRINT 2015

REFERENCES

1. Alan Simpson, Easy Guide to Windows, BPB, 2012

2. The Compact Guide to MS- Office –Mansfield, BPB, 2014

II B.A. SEMESTER – IV

ENVIRONMENTAL STUDIES

TOTAL HOURS: 1 [15 Hours]

COURSE CODE: 174002

CREDITS: 2

Unit I : The Multi disciplinary nature of environmental studies:

Definition, Scope of importance, Need for awareness.

Unit II : Natural Resources: Renewable and non-renewable resources:

Natural Resources and associated problems:

•**Forest Resources:** User and Over – exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

•**Water Resources:** Use and over – utilization of surface and ground water, floods, drought, conflicts over water, dams – benefits and problems.

•**Mineral Resources:** Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

•**Food resources:** World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

•**Energy Resources:** Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, case studies.

•**Land Resource:** Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources.

Equitable use of resources for sustainable lifestyles

Unit III : Ecosystem: Concept of an ecosystem– Structure and function of an ecosystem– Procedures, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – introduction, types, characteristics features, structure and function of the following ecosystem: Forest ecosystem

- Grassland ecosystem
- Desert ecosystem
- Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Unit IV : Biodiversity and its conservation

•Introduction – Definition: genetic, species and ecosystem diversity.

•Biographical classification of India.

•Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.

•Biodiversity at Global, National and Local Level.

•India as a mega – diversity nation

- Hot – spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man & wildlife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit V : Environmental Pollution: Definition

1. Causes, effects and control measures of

- Air pollution
- Water pollution
- Soil pollution
- Marine pollution
- Noise pollution
- Thermal pollution
- Nuclear pollution

2. Solid Waste Management: Causes, effects and control measures of urban and industrial wastes.

3. Role of an individual in prevention of pollution

4. Pollution case studies

5. Disaster management: floods, earthquake, cyclone and landslides.

Unit VI : Social Issues and the Environment

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents, and holocaust. Case studies.
- Wasteland reclamation
- Consumerism and waste products
- Air (Prevention and Control of Pollution) Act
- Water (Prevention and Control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

Unit VII : Human social Issues and the Environment

- Population growth, variation among nations.
- Population explosion – Family Welfare Programme
- Environment and human health
- Human Rights
- Value Education
- HIV / AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and human health
- Case Studies

Unit VIII : Field Work

- Visit to a local area to document environmental assets – river/forest/ grassland / hill mountain.
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural Study of common plants, insects and birds.
- Study of simple ecosystems – Pond, river, hill slopes, etc.
(Field work Equal to 5 lecture hours)

III B.A. SEMESTER – V

Core	Shakespeare
	New Literature
	Women's Writing
	Language And Linguistics
Elective I	Journalism
	Creative Writing
VE	Value Education

III B.A. SEMESTER – V

SHAKESPEARE

TOTAL HOURS: 6 (90 Hours)

COURSE CODE:171509

CREDITS: 4

COURSE OBJECTIVES:

1. To enable students to recognise Shakespeare's contribution to English Literature
2. To understand the universality of his themes
3. To appreciate his dramatic and poetic skills

COURSE OUTLINE:

UNIT I **Hours: 10**

Shakespeare and his Age
Elizabethan Theatre and Audience
Shakespeare's Sources

UNIT II **Hours: 20**

Julius Caesar

UNIT III Hours: 20

Taming of the Shrew

UNIT IV **Hours: 20**

Henry IV - Part I

UNIT V

Hours: 20

Soliloquies

i. **Hamlet- To be or not to be**(Act 3, sc.1)

ii. **Macbeth-** Is this a dagger which I see before me (Act 2, sc.1)

iii. **Othello-** And whate'er he that says I play the villain (Act 2, sc.3)

iv. **A Midsummer Night's Dream** – How happy some o'er other some can be! (Act 1, sc1)

RECOMMENDED TEXTBOOKS:

1. *The Cambridge Introduction to Shakespeare's History Plays*, Cherniak Warren, Cambridge University Press
2. *Essays on Shakespeare*, William Empson, Cambridge University Press

REFERENCE BOOKS:

1. Wells Stanley, *The Cambridge Companion to Shakespeare Studies*, Cambridge UP
2. Bradley A.C., *Shakespearean Tragedy*
3. Granville Barker, G. B. Harrison, *A Companion to Shakespeare Studies* Macmillan, 1934
4. Caroline F.E. Spurgeon, *Shakespeare's Imagery and What it Tells Us*, , Cambridge University Press
5. G. Wilson Knight, *The Wheel of Fire: Interpretations of Shakespearean Tragedy*, , Routledge Classics

JOURNALS:

1. Shakespeare Quarterly
<https://www.jstor.org/journal/shakquar>
2. Shakespeare Bulletin
<https://www.press.jhu.edu/journals/shakespeare-bulletin>
3. <https://www.britishshakespeare.ws/journal/>
<http://www.indianjournals.com/ijor.aspx?target=ijor:adi&volume=1&issue=2&article=009&type=pdf>

E-LEARNING RESOURCES:

- 1.<https://morningside.libguides.com/shakespeare/online>
- 2.<https://library.shu.edu/shakespeare-resources>
- 3.<https://www.onlinecollege.org/2009/12/16/100-incredibly-useful-links-for-teaching-and-studying-shakespeare/>
- 4.<http://theshakespeareblog.com/online-resources/>
- 5.<https://www.folger.edu/online-resources>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Students are able to recognise Shakespeare's contribution towards English Literature
CO 2	Learners are able to draw out the universality of his themes
CO 3	Students can appreciate Shakespeare's dramatic and poetic skills
CO 4	Learners recognise dramatic techniques employed by Shakespeare
CO 5	Learners understand some of the features of Shakespeare's language

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3

CO3	3	3	3	3	3
CO4	2	2	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

III B.A. SEMESTER - V

NEW LITERATURE

TOTAL HOURS: 6 (90 Hours)

COURSE CODE: 171510

CREDITS: 4

COURSE OBJECTIVES:

1. To familiarise students with the writings in English from 'commonwealth countries'
2. To introduce the historical context of New literature in English
3. To help students comprehend the literary concepts of Post Colonialism
4. To understand the issues and themes in New Literature

COURSE OUTLINE:

UNIT I

Hours: 20

Understanding Terms: Colonialism, Commonwealth, Decolonization, Eurocentricity, Ethnicity, Hegemony, Globalization, Hybridity, Imperialism, New Literature, Orientalism and Other.

UNIT II : Poetry

Hours: 20

Australia	A. D. Hope	Standardization
Pakistan	Zulfikar Ghose	Picnic in Jammu
West Indies	E. K. Brathwhite	Tizzic
Sri Lanka	Yasmine Goonaratne	The Peace Game
West Indies	Mervyn Morris	Judas
New Zealand	Allen Curnow	House and Land
Canada	George Cameron	The Future
Africa	Kofi Awoonor	Song of Sorrow

UNIT III : Drama

Hours: 20

Australia	Jane Harrison	Stolen

UNIT IV : Novel

Hours: 15

Africa	Chinua Achebe	Things Fall Apart

UNIT V : Short Stories

Hours: 15

Australia	Henry Lawson	Drover's Wife
Africa	Nadine Gordimer	Ultimate Safari
Canada	Alice Munro	Boys and Girls
New Zealand	Owen Marshall	Cabernet Sauvignon with my Brother

RECOMMENDED TEXTBOOKS:

1. Geoffrey V. Davis, Peter H. Marsden, Bénédicte Ledent, Marc Delrez, *Towards a Transcultural Future: Literature and Society in a 'Post'-Colonial World - Vol. 2*

Rodopi, 2004

2. A.L. McLeod, *The Commonwealth Pen: An Introduction to the Literature of the British Commonwealth*, Cornell University Press, 1961

REFERENCE BOOKS:

1. Walsh, William. *Readings in Commonwealth Literature*, OUP, 1973
2. Narsimiah C. D. *An Anthology of Commonwealth Poetry*,
3. Thieme, John, *The Arnold Anthology of Post Colonial Literature*,
4. Ashcroft, Bill, et al. *Postcolonial Studies :Key Concepts*, Trinity, 2014
5. Radhika Mohanram, Gita Rajan, *.English Postcoloniality: Literatures from around the World*, Greenwood Press, 1996

JOURNALS

1. <http://www.the-criterion.com/>
2. The Journal of commonwealth Literature
<https://journals.sagepub.com/loi/jcl>

E-LEARNING RESOURCES:

1. Canadian Literature - Literary Research: Strategies and ...
libguides.du.edu › LibGuides › Literary Research: Strategies and Sources

2. Post-Colonial - English Faculty Library Subject Guides ..
libguides.cam.ac.uk › resourcesforpapers › Postcolonial

3. Journal of Commonwealth Literature - SCImago
<https://www.scimagojr.com › journalsearch>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	can discuss, and analyse colonial and postcolonial texts,
CO 2	know how race, class, gender, history, and identity are presented and problematised in the literary texts,
CO 3	have an understanding of the relationship between Great Britain (and implicitly the West) and nations that were once colonized
CO 4	Identify key questions, authors, and literary forms in postcolonial literature

CO 5	Think critically about these texts in relation to postcolonial theory

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	2	3	3
CO5	2	3	3	3	3
AVERAGE	3	3	3	3	3

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

III B.A. SEMESTER - V

WOMEN'S WRITING

TOTAL HOURS: 6 (90 Hours)

COURSECODE:171511

CREDITS: 4

COURSE OBJECTIVES:

- 1.To help students understand feminism in its diverse cultural context
- 2.To sensitise the students to the various issues that women face
3. To enable the students to interpret literary text written by women from a feminist perspective

COURSE OUTLINE:

UNIT I : INTRODUCTION

Hours: 6

Historical view of Feminist Movements – First wave feminism,
Second wave, Third wave

UNIT II: PROSE

Hours: 20

Mary Wollstonecraft	: From A Vindication of the Rights of Women.-Chapter 12
Virginia Woolf	: Professions for Women

UNIT III: POETRY

Hours: 17

Margaret Atwood	: Marsh Languages
Kamala Das	: Freaks
Jenny Lind	: Wonder Woman
Forough Farrokhzad	: The Wedding Bond

UNIT IV: DRAMA**Hours: 22**

Sharon Pollock

: Blood Relations

UNIT V: FICTION/SHORT STORY**Hours: 25**

Buchi Emecheta

: Second Class Citizen

Simon De Beauvoir

: Monologue

Ambai

: My Mother Her Crime

Alice Walker

: Everyday Use

RECOMMENDED TEXTBOOKS:

1. Wollstonecraft, Mary. *A Vindication of the Rights of Women*, London, 1792
2. Gilbert, Sandra M., Susan Gubar. Eds. *The New Feminist Criticism: Essays on Women, Literature and Theory*, Virago Press, 1989.

REFERENCE BOOKS:

1. Gilbert, Sandra, M. Susan Gubar, *The Madwoman in the Attic: The Woman Writer and the Nineteenth-Century Literary Imagination*, Yale University Press
2. Oakley, A. *Sex, Gender, and Society*, Temple Smith, 1985.
3. Gamble Sarah Ed., *The Routledge Companion to Feminism and Postfeminism*, Routledge, 1998.
4. Adichie, Chimamanda Ngozi, *We Should All Be Feminists*, Fourth Estate, 2014
5. Woolf, Virginia, *A Room of One's Own*, Penguin UK, 2002

JOURNALS:

1. The Indian Journal of Gender Studies
2. Asian Journal of Women's Studies
3. International Journal of Gender and Women's Studies

E-LEARNING RESOURCES:[1.Resources and Links - Gender and Women's Studies - Library ..](#)<https://guides.lib.berkeley.edu> > ... > Gender and Women's Studies[2.Selected Gender & Women's Studies Websites – Social ...](#)<https://www.library.illinois.edu> > sshel > genderwomens > gwsweb[3.Resources and Links - Gender and Women's Studies - Library ...](#)<https://guides.lib.berkeley.edu> > ... > Gender and Women's Studies

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	know some of the developments, themes, and narrative strategies of women's writing
CO 2	Interpret and analyse literary works by women
CO 3	know the central points of a selection of feminist theory
CO 4	can use feminist theory as a context for reading literary texts
CO 5	can analyse literary texts through the perspectives of gender

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	2	3	3	3
CO4	3	3	3	3	3

CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORRELATION-0

III B.A. SEMESTER - V

Language and Linguistics

Total Hours : 6 (90 Hours)
Credits : 4

Course Code : 171512

Course Objectives

1. To introduce students to the history of the English Language
2. To explore the sound and structure of the English Language
3. To introduce student to Phonetic Transcription

Course Outline

UNIT I: Language

Hours:16

The Origin of Language
Animal Communication and Human Language
Properties of Language

UNIT II: General Character of English Language

Hours:16

The Indo-European Family
The Germanic Family
English in the Germanic Family
Landmarks in the history of English [Old English, Middle English, Modern English]

UNIT III: Individuals and the making of English and the English Language today

Hours: 20

Bible Translations
Shakespeare's Influence
Milton and the English Language
American Influence
English as a World Language

UNIT IV: The Sounds of Language – Phonetics

Hours:30

Organs of Speech
Consonants, Vowels, Diphthongs
Three-term Label

UNIT V

Hours: 8

Transcription of Words

Recommended Text book

1. Wren C.L., *The English Language*, ATBS Publisher, 2011
2. Daniel Jones, *The Pronunciation of English*, 4th Edition : Cambridge University Press

Reference books

1. Crystal, David. *A Dictionary of Linguistic and Phonetics* 5th Edition, John Wiley and Sons Ltd.
2. Yule, George. *The Study of Language* 6th Edition : Cambridge University Press, 2006
3. Mathew, Peter. *The Concise Oxford Dictionary of Linguistics* : Oxford University Press, 2014
4. Trask R.L., *Key Concepts in Language and Linguistics* 2nd Edition : Taylor & Francis
5. Gick, Bryan, Ian Wilson, Donald Derrick. *Articulatory Phonetics*, Wiley Blackwell, 2013

Journals

1. Journal of the International Phonetic Association
2. *Phonetica* : International Journal of Phonetic Science
3. The Linguistics Journal

E-Learning Resource

1. <http://www.libguides.ntu.edu.sg/eresource>
2. www.antimoon.com/phone
3. <http://www.phon.ucl.ac.uk>
4. <http://www.oxfordreference.com>
5. <http://lib.umich.edu/c.php>

Course Outcome

CO. No.	Course outcome statement
CO 1	The student will have a broad overview of the history of the English Language
CO 2	Would have basic knowledge of the sound and how to articulate them correctly
CO 3	Acquires knowledge of various units of the English Language which join together to create viable structures
CO 4	Develop an awareness of socio-linguistic aspects of the language
CO 5	Would be able to do Phonetic Transcription of simple words.

Mapping

Course Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	1	2
CO 2	2	1	3	1	2
CO 3	2	1	3	1	2
CO 4	1	2	3	1	2
CO 5	2	1	3	1	2
Average	1.8	1.66	2.80	1.0	2.0

III B.A. SEMESTER – V

JOURNALISM (Major Elective I)

TOTAL HOURS: 5(75 Hours)

COURSE CODE: 171513

CREDITS: 5

COURSE OBJECTIVES:

1. To introduce students to basic trends of journalism
2. To train students in writing for newspaper and develop their journalistic skill
3. To sensitize the students on mass media and information revolution.

COURSE OUTLINE:

UNIT I : INTRODUCTION

Hours: 15

The Mass Media
Basic Principles of Journalism
Introduction to the Print media

UNIT II : PRINT MEDIA

Hours: 15

Newspaper organization
Structure and function of Newspaper
News Agencies
Freedom of the Press
Press Laws – Defamation, Libel, Contempt of court, Copyright laws,
Working Journalistic Act and Press Registration Act.

UNIT III : NEWS

Hours: 15

The characteristics of News
Structure of News
Types of News stories
Journalistic forms – Feature, Editorial, Column and Review

UNIT IV : THE NEWS OPERATION – Qualities, Duties and Responsibilities of

Hours: 15

Reporter
Sub-Editor
Editor

UNIT V : MEDIA AND INFORMATION REVOLUTION

Hours: 15

Photo Journalism
Radio / TV Broadcasting
Internet Journalism

RECOMMENDED TEXTBOOKS:

1. M.V.Kamath, *Professional Journalism*, Vikas Publishing House pvt.ltd.
2. Tom Kovach, Tom Rosenstiel, *The Elements of Journalism*, Three Rivers Press, 2014

REFERENCE BOOKS:

1. Chakraborty Jagadish. *Net, Media and Mass Communication*. Delhi: Authorspress, 2004

2. Kamath M.V. *Professional Journalism*. Vikas Publishing House, 2009.
3. Kumar keval J. *Mass Communication in India*. New Delhi: Jaico Pub., 2010.
4. ParthasarathyRangaswamy. *Basic Journalism*. Macmillan, 1984.
5. Campbell L R. And R.E. Wolseley. *How to Report and Write News*. New York: Prentice Hall, 1961.

JOURNALS:

1. Journalism and Mass communication Quarterly: SAGE Journals.
2. Journalism Studies – Jaylor and francis online.

E-LEARNING RESOURCES:

1. <https://www.britannica.com/topic/news-agency>
2. <https://bconsi.blogspot.com/2013/03/features-of-mass-communication.html?m=1>
3. <https://www.prsindia.org/hi/theprsblog/regulation-media-india-brief-overview>
4. <https://resources.workable.com/editor-job-description>
5. <https://www.carrerride.com/GD-electronic-media-vs-print-media.aspx>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Gets the knowledge of the basic terms in journalism
CO 2	Understood the organizational structure of a newspaper
CO 3	Able to write various news stories
CO 4	Differentiates the various journalistic forms
CO 5	Enhances journalistic skills to become a journalist

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	2
CO2	2	2	3	3	2
CO3	3	3	2	2	3
CO4	3	3	3	2	3
CO5	3	3	2	3	2
AVERAGE	2.8	2.8	2.4	2.4	2.4

KEY: **STRONGLY** CORRELATED-3 **MODERATELY** CORRELATED-2**WEAKLY** CORRELATED-1
NO CORRELATION-0

III B.A. SEMESTER – V

CREATIVE WRITING (Major Elective I)

TOTAL HOURS: 5(75Hours)

COURSE CODE:

CREDITS: 5

COURSE OBJECTIVES:

1. To train students to identify their inherent creative skills
2. To Strengthen their creative skills in various aspects of narrative writing
3. To encourage students to pen poems.

COURSE OUTLINE:

UNIT I : INTRODUCTION

Hours: 15

Basic Principles of Writing – Style and Writing Techniques

UNIT II : POETRY

Hours: 15

Chief elements: theme, structure, imagery
Major poetic forms
Poetry writing sessions

UNIT III : SHORT STORY

Hours: 15

Characteristic features – plot construction, characterization, narration
Short Story writing sessions

UNIT IV : WRITING FOR CHILDREN

Hours: 15

Varieties – themes – fantasy – language – imparting values and morals

UNIT V : BOOK AND FILM REVIEWS

Hours: 15

Elements of book/film reviewing - aim of book and film review
Practice sessions

RECOMMENDED TEXTBOOKS:

1. William Zinsser. *On Writing Well*, HarperCollins, 2006
2. Roy Peter Clark. *Writing Tools*, Little, Brown and Company. 2008

REFERENCE BOOKS:

1. Dev Anjana Neira, Anuradha Marwah, Swati Pal. *Creative Writing*, Pearson Education India
2. Birkett Julian. *Word Power: A Guide to Creative Writing*, A&C Black. 1998
3. Baldwin, Michael. *The Way to Write Short Stories*, Elm Tree. 1986
4. Baldwin, Michael. *The Way to Write Poetry*, Elm Tree. 1986

- Bernays, Anne and Pamela Painter. *What If: Writing Exercises for Fiction Writers*, William Morrow & Company.1991

JOURNALS:

- Journal of Creative Writing Studies
- The International Journal for the Practice and theory of Creative Writing

E-LEARNING RESOURCES:

- <https://owlcation.com/humanities/Poetic-Forms-in-English-Literature>
- <https://openoregon.pressbooks.pub/aboutwriting/chapter/types-ofwriting-styles/>
- <https://www.writerscookbook.com/writing-for-children/>
- https://www.myenglishpages.com/site_php_files/writing-film-book-review.php
- <https://self-publishingschool.com/how-to-write-a-short-story/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Accomplished in creating, editing and revising in writing skills
CO 2	Recognised different writing skills and genres
CO 3	Able to experiment with different writing styles
CO 4	Enable to write book reviews
CO 5	Able to criticize films

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	2	2	2
CO2	3	2	3	3	2
CO3	3	3	2	2	3
CO4	3	2	3	3	3
CO5	3	3	2	3	2
AVERAGE	2.8	2.6	2.4	2.6	2.4

KEY: **STRONGLY** CORELATED-3 **MODERATELY** CORELATED-2**WEAKLY** CORELATED-1 **NO** CORELATION-0

III B.A. SEMESTER – V

Value Education

TOTAL HOURS: 1 [15 Hours]

COURSE CODE: 174003

CREDITS:

UNITS

1. 'Building self-confidence' by Norman Vincent Peale

2. 'Living Excellence' by Anthony Robbins
3. 'Kinds of Values' by S. Ignacimuthu. S.J.
4. 'What is Ethics?' by Swami Vivekananda
5. 'Essential Characteristics of Human Rights' by H. Victor Conde

Text Prescribed:

a. Fr. Ignacimuthu, Ed. : *Touchstone - Synergy of Values*.

SEMESTER VI

III B.A. SEMESTER – VI

Core	Literary Theory And Criticism
	English Language Teaching
	World Classics
Elective II	Indian Literature in English Translation
	Modern European Literature
Elective III	English For Competitive Examinations
	Copy Editing
VE	Value Education

III B.A. SEMESTER - VI

LITERARY THEORY AND CRITICISM

Total Hours: 6 (90 Hours)

Course

Code :171514

Credits: 5

Course Objectives

1. To introduce students to the beginning of literary criticism in the classical world
2. To span the history of English literary criticism and introduce students to vital moments in its history
3. To introduce the students to literary trends

Course Outline

UNIT I

Hours:20

Principles of Literary Criticism
Types of Literary Criticism
Theoretical Criticism, Practical Criticism, Mimetic Criticism,
Objective Criticism, Historical Criticism, Social Criticism,
Archetypal Criticism, Formalist Criticism, Psychoanalytic Criticism,

UNIT II

Hours:16

Aristotle : From *Poetics* – Chapter VI (Tragedy – definition, elements of Tragedy)

UNIT III

Hours:21

Sidney : From *An Apology for Poetry* - “Poesy, therefore is an art most excellent workman ” [Lines 253 - 780]

Dryden : “Preface” to *Fables, Ancient and Modern*

UNIT IV

Hours:19

Wordsworth : Preface to *Lyrical Ballads*

D.H. Lawrence : Why the Novel Matters

T.S. Eliot : The Tradition and Individual Talent

UNIT V

Hours:14

Hiriyanna M : The Main Aspects of Indian Aesthetics

Recommended Text book

1. M.H. Abrams *A Glossary of Literary terms* 6th Edition, Texas: Harcourt Brace College, 1993
2. Nagarajan M.S., *English Literary criticism and Theory: An Introductory History*

Reference books

1. Devy, G.N. *Indian Literary criticism: Theory and Interpretation*: Hyderabad, Orient Longman, 2002
2. Lodge , David. *Twentieth Century Literary criticism: A reader*: London , Orient Longman, 1972
3. Ian Buchanan, *A Dictionary of Critical Theory*, Oxford Press
4. Patricia Waugh, *Literary Theory and criticism: An Oxford guide*
5. Bijay Kumar Das, *Twentieth Century Literary criticism*

Journals

1. Criterion : a journal of Literary Criticism
2. Essays in Criticism : Oxford Academics . Oxford Journal

E-Learning Resource

1. <http://www.britannica.com>art>literature>
2. <http://libguides.uwf.edu>c.php>

3. <http://libguides.uccs.edu/c.php>

Course outcome

CO. No.	Course outcome statement
CO 1	The students will gain knowledge about critical idea and theory during ancient time
CO 2	Will become aware of history of criticism
CO 3	Acquainted with important incidents and milestones in development of criticism
CO 4	Acquire knowledge about important literary figures and their contribution to criticism
CO 5	Will know about the literary trends

Course Outcomes

Course Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	3	1	1
CO 2	2	2	3	1	2
CO 3	3	3	2	2	1
CO 4	2	2	2	2	2
CO 5	2	3	3	2	1
Average	2.2	2.6	2.6	1.6	1.4

III B.A. SEMESTER - VI

ENGLISH LANGUAGE TEACHING

TOTAL HOURS: 5 (75 Hours)

COURSECODE:171515

CREDITS: 4

COURSE OBJECTIVES:

1. To introduce students to the basic concepts of language teaching.
2. To review the history of English Language teaching in the Indian context.
3. To explore the various approaches to Language Acquisition.
4. To acquire various testing skills.
5. To draft lesson plan.

COURSE OUTLINE:

UNIT I : Overview

Hours: 15

English in India
Aims & Objectives of ELT

UNIT II :Approach, Methods and Technique

Hours: 15

Michael West – General Service List
Grammar Translation Method
The Oral Approach, Situational Language Method
The Audio-lingual Method
Communicative Language Teaching

UNIT III :Theories of language

Hours: 15

Pavlov's classical conditioning
Thorndike's connectivism
Skinner's operant conditioning
Behaviorism, Cognitivism

UNIT IV :Teaching of language skills

Hours: 15

LSRW Skills
Handling large classes
Remedial Teaching

UNIT V :Evaluation and Lesson Plan

Hours: 15

Types, Aims & Purposes of Tests
Drafting Lesson Plan : How to teach a poem
Teaching English through Songs

RECOMMENDED TEXTBOOKS:

1. Geetha Niagaraj. *English Language Teaching*. Approach, Methods, Techniques.
2. Jean Forester. *Teaching Without Lecturing*.

REFERENCE BOOKS:

1. Allen JPB and Alan Davies. *Testing and Experimental Methods*.
2. Jean Forester. *Teaching without Lecturing*.
3. Krishnaswamy N and LalithaKrishnaswamy. *Teaching English: Approaches, Methods, and Techniques*. Chennai: M acmillan, 2003.
4. Neena Dash M. Dash. *Teaching English as an Additional Language*.
5. Tickoo M.L. *English Language Teaching*.
6. Wilkins ELBS. *Linguistics in Language Teaching*.

JOURNALS:

1. Journal of English Language Teaching – ELTAI
2. ELT Voices – International Journal for the Teachers of English

E-LEARNING RESOURCES:

1. <https://www.preservearticles.com/education/what-are-the-aims-and-objectives-of-teaching-english/2649>
2. <https://www.ukessays.com/essays/english-language/methods-and-approaches-of-english-language-teaching-english-language-essays.php>
3. <https://www.fluentu.com/blog/theory-of-language-learning/>
4. <https://www.englishmate.com/blog/developing-the-four-essential-skills-listening-speaking-reading-writing/>
5. <https://www.crit.umich.edu/resources/evaluation-teaching/methods>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Comprehend basic concepts of language teaching
CO 2	Understood history of English Language teaching in the general context
CO 3	Explore the explore the various approaches to language teaching
CO 4	Acquire various testing skills
CO 5	Draft lesson plan

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	2
CO2	2	3	3	3	2
CO3	3	3	2	2	3
CO4	3	3	3	3	3
CO5	3	3	2	3	2
AVERAGE	2.8	3	2.4	2.6	2.4

KEY: **STRONGLY** CORELATED-3 **MODERATELY** CORELATED-2**WEAKLY** CORELATED-1 **NO** CORELATION-0

III B.A. SEMESTER - VI**WORLD CLASSICS**

TOTAL HOURS: 6 (90 Hours)

COURSE CODE:171516

CREDITS: 4

COURSE OBJECTIVES:

1. To introduce students to the world's best classics in translation
2. To enable students to appreciate the writings for their literary values and cultural importance
3. To facilitate cross-cultural perspectives
4. To generate a broad vision of life by making students come to grips with universal problems and various life situations

COURSE OUTLINE:

UNIT I	PROSE	Hours: 17
	Goethe Montaigne	On World Literature 1. Of Idleness 2. Of Fear
UNIT II	POETRY	Hours: 20
	Purananooru Rumi Petrarch Basho Rilke Homer Horace	Every town a Hometown The Guesthouse Sonnet 101 Haiku (5 poems) A Walk The Iliad Book XIV Lines 82-134 (Odysseus reproaches Agamemnon) Book i: xi Carpe Diem Book ii: x The Golden Mean
UNIT III	DRAMA	Hours: 25
	Sophocles	Oedipus the King
UNIT IV	NOVEL	Hours: 18
	Victor Hugo	Les Miserables
UNIT V	SHORT STORIES	Hours: 10
	Guy de Maupassant	Boule De Suif

RECOMMENDED TEXTBOOKS:

Mark Van Doren, *An Anthology of World Poetry*, The Literary Guild of America, 1928

Magill, Frank, *Masterpieces of World Literature*, Harper & Row, 1989

REFERENCE BOOKS:

1. Beard Mary, and John Henderson, *Classic: A Very Short Introduction*, OUP, 2006
2. Newly Recovered English Classical Translations, 1600-1800
Stuart Gillespie
3. The Norton Anthology of World Literature, W.W. Norton & Company, 2012
4. The Harper Collins Book of English Poetry Ed. Sudeep Sen
5. The Routledge Companion to World Literature, 2011

JOURNALS:

1. The Journal of World Literature
2. World Literature Today
3. World Literature Studies
4. Delos: A Journal of World Literature and Translation

E-LEARNING RESOURCES:

1. <https://archive.org/details/sophoclesoedipus00haro>
2. <https://guides.library.illinois.edu/chekhov>
3. <http://mason.gmu.edu/~ayadav/Goethe%20on%20World%20Literature.pdf>
4. <http://thedailyidea.org/montaigne-quotes-resources/>
5. <https://www.questia.com/library/literature/fiction/novelists/victor-hugo>
6. <https://www.scribd.com/document/313365649/Chekhov-s-Heartache-Analysis>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Can comprehend texts in English and in English translation.
CO 2	Demonstrate a familiarity with the styles of authors in the major genres of prose and poetry
CO 3	Use critical thinking skills to gain insight into the cultural, historical, and literary contexts of major Western and non-Western works.
CO 4	Explain the diversity of cultures and the commonalities of human experience reflected in the literature of the world.
CO 5	Examine oneself and one's culture through multiple frames of reference, including the perception of others from around the world.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

III B.A. SEMESTER - VI

INDIAN LITERATURE IN ENGLISH TRANSLATION

(Major Elective II)

Total Hours : 6 (90Hours)

Course

Code :171517

Credits : 5

Course Objectives

1. To enable students to get a glimpse of rich diversity of culture and literature in regional languages through Translation
2. To read , understand and interpret literature of different regional languages in India
- 3.To make students aware of various socio-political, cultural issues dealt in the regional languages

COURSE OUTLINE:

UNIT I	PROSE	Hours: 17
	Marathi	IravatiKarve
	Hindi	Shahid Ahmad Dehlvi
		The Palace of Maya An extract from Yuganta Delights of Chowk

UNIT II	POETRY	Hours: 17
	Tamil	Bharathiyar
	Telugu	Vimala
	Kannada	ChadraserkarKambar
	Marathi	DilipChitre
	Hindi	Nirala
		Wind
		The Kitchen
		Water
		They Tell me your Colour is Blue
		Recognized
UNIT III	DRAMA	Hours: 20
	Hindi	Mahesh Elkunchwar
		Old Stone Mansion
UNIT IV	NOVEL	Hours: 20
	Malayalam	Vajkom Mohammed Basheer
		Me Grandad Had An Elephant
	Kannada	Girish Kasaravalli
		Dweepa
UNIT V	SHORT STORY	Hours: 16
	Tamil	Pudumaipithan
	Bengali	Mahashwetha Devi
	Hindi	Premchand
	Telugu	GoguShyamala
		OruNaalKazhinthathu
		The Five Women
		Idgah
		Father may be an Elephant and
		Mother only a small basket but

Recommended Text book

1. SujithMukerajee, *Translation as Discovery*, Orient Longman, 1994
2. Anna Kurien, *Texts and their worlds*, Foundation Books

Reference books

1. K.S. Ramamurthy, *Twenty Five Indian Poets in English*
2. Amit Chaudhuri, *The Picador Book of Modern Indian Literature*
3. *Indian Fiction in English Translation*, Ed. Shubha Tiwari, Atlantic Publishers & Distributors, 2005
4. *Katha: Short Stories by Indian Women*, Ed. Urvashi Butalia, Stanza, 2007
5. Bama, *Sangati: Events*, Tr. Lakshmi Holmstrom, Oxford University Press, 2005

Journals

1. Sahitya : Journal
2. Indian Literature : Journal

E-Learning Resource

1. <http://www.academia.edu>
2. <http://www.tandfonline.com>>abs
3. <http://www.scribd.com>>...>science
4. www.languageinindia.com

Course Outcomes

CO. No.	Course outcome statement
CO 1	The students become sensitized of rich diversity in culture of India.
CO 2	Attain accessibility to literatures of different regional languages through translation.
CO 3	Would be able to interpret and contextualize the text.
CO 4	The learner becomes aware of various socio-political, cultural issues of different regions and the way they dealt in regional languages.
CO 5	Analyze and Co-relate the issues with current scenario

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

Course Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	3	1	2	2
CO 2	3	3	1	2	2
CO 3	3	3	1	3	2
CO 4	3	3	1	3	1
CO 5	3	3	2	2	2
Average	3.0	3.0	1.2	2.4	1.8

III B.A. SEMESTER - VI

Modern European Literature (Major Elective II)

**Total Hours : 6 (90 Hours)
Credits : 5**

Course Code :

Course Objectives

- 1.To familiarize students with writings from European Literature
- 2.To Comprehend the dilemmas of modern consciousness
- 3.To help students comprehend the various literary concepts

Course Outline

UNIT I	LITERARY TRENDS	Hours:20
	Realism Existentialism Modernism Postmodernism	
UNIT II	PROSE	Hours:16
	Michael Foucault : Archeology of Knowledge Part I (Chapter 1-7) Martin Buber : I and Thou	
UNIT III	POETRY	Hours:16
	Rilke : The Swan Gunter Grass : Do Something	
UNIT IV	DRAMA	Hours:18
	Eugene Ionesco : Rhinoceros	

Pirandello : *Six Characters in Search of an Author*

UNIT V NOVEL

Hours:20

Umberto Eco : *The Name of the Rose*
Thomas Bernhard : *Correction*

Recommended Text book

1. Bradbury Malcolm and James Mcfarlane .*Modernism : A Guide to European Literature 1890-1930*
2. Weller S, Baldwin T and B. Hutchison. *Palgrave Studies in Modern European Literature* Macmillan

Reference books

1. Martin Travers, *An Introduction to Modern European Literature*
2. Margret C. , *A Handbook of Modern European Literature*
3. Walter Cohen,*A History of European Literature*, OUP, 2017
4. Ionesco, Eugene. *The Chairs*: Penguin, 1997.
5. Foucault, Michel. *Ethics : Subjectivity and Truth : Essential Works of Foucault, Ed Paul Rabinow* : Penguin

Journal

1. Journal of European Studies : Sage Journal
2. Journal of Contemporary European Studies

E-Learning Resource

1. [http:// www.goodread.com](http://www.goodread.com)>show
2. <http://www.palgrave.com>>series
3. <http://www.hackettpublishing.com>>
4. <http://muses.jhu.edu.article>>pdf

Course outcome

CO. No.	Course outcome statement

CO 1	The students gain knowledge about European Culture.
CO 2	Gain access to European Literature
CO 3	Comprehend the dreams and aspirations, the challenges and struggles of the European consciousness
CO 4	will be able to understand literary concepts
CO 5	Co-relate European issues with the universal issues

Mapping

Course Objectives	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	3	2	2	2
CO 2	3	3	1	2	2
CO 3	3	3	1	2	2
CO 4	1	1	3	3	2
CO 5	3	3	1	2	3
Average	2.6	2.6	1.6	2.2	2.2

III B.A. SEMESTER - VI

ENGLISH FOR COMPETITIVE EXAMINATIONS
(Major Elective III)

TOTAL HOURS: 5 (75 Hours)

COURSE CODE: 171518

CREDITS: 5

COURSE OBJECTIVES:

1. To train students to develop fluency in English.
2. To prepare students for competitive examination.
3. To hone in English Grammar and develop their communicative skills

COURSE OUTLINE:

UNIT I **Hours:15**

Vocabulary
Synonyms and Antonyms
One-word substitution
Idioms and phrases
Foreign words and phrases

UNIT II **Hours:15**

Correction of sentences
Figures of speech
Books and Authors

UNIT III **Hours:15**

Note-making
Letter writing
E-mail

UNIT IV **Hours:15**

Paragraph writing
Essay writing

UNIT V **Hours:15**

Reading Comprehension
Bar diagrams and graphs

RECOMMENDED TEXTBOOKS:

1. Bhatnagar R.P and Rahul Bhargava. *English for Competitive Examinations*, Macmillan, Enrich your English-CIEFL.
- 2 .Krishnaswamy N. *Modern English: A Book of Grammar, Usage and Composition*. Macmillan, 2000.

REFERENCE BOOKS:

1. Narayanaswamy V.R. *Strengthen Your Writing*. Hyderabad: Orient Longman, 1979.
2. Radhakrishnapillai G, K. Rajeevan and P. Bhaskaran Nair. *Written English for You*. Emerald, 1990
3. V. Saraswathi, Maya K. Mudbhatkal, *English for Competitive Examinations*, Emerald Publishers, Chennai.2002
4. G.Radhakrishnan Pillai. *English for Success*, Emerald Publishers, Chennai.2003
5. H.M.Williams, V.Saraswathi, *A Handbook of English Grammar with Usage and Composition*, AnuChithra Publications, Chennai.1999

JOURNALS:

1. Competition Success Review
2. World Focus

E-LEARNING RESOURCES:

1. <https://study.com/academi/lesson/figure-of-speech-definition-types-examples.html>
2. <https://www.toppr.com/guides/business-correspondence-and-reporting/note-making/styles>
3. <https://www.mbauniverse.com/reading-comprehension-passages>
4. <https://www.times4writing.com/writing-resources/writing-five-paragraph-essays-forstandardized-test/>
5. <https://www.successcds.net/learn-english/writing-skills/letter-writing-format-formal-letter-informal-letter-samples-topics.html>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Learners have developed to speak English fluently
CO 2	Students are able to prepare for competitive exams
CO 3	Pupil are trained in multiple choice questions
CO 4	Awareness is created on the thrust areas
CO 5	Learners had gained the knowledge on how to apply and attend various competitive exams

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	2	2	2
CO2	2	3	3	3	2
CO3	3	3	2	2	3
CO4	3	2	3	2	3
CO5	3	3	2	3	2
AVERAGE	2.6	2.8	2.4	2.4	2.4

KEY: **STRONGLY** CORELATED-3 **MODERATELY** CORELATED-2**WEAKLY**
CORELATED-1 **NO CORELATION**-0

III B.A. SEMESTER - VI**COPY EDITING (Major Elective III)**

TOTAL HOURS: 5 (75 Hours)

COURSE CODE:

CREDITS: 5

COURSE OBJECTIVES:

1. To enable the students to understand copy editing and its various methods.
2. To identify various types of scripts and proof reading.
3. To differentiate between American and British English.

COURSE OUTLINE:

Unit I : Hours:15

Introduction to copy editing

Typescripts

Unit II : Hours:15

Grammar and English Language with common errors

Difference between American English and British English

Unit III : Hours:15

Basic Proof Reading Symbols

Mark Corrections

Unit IV : Hours:15

In - house styles

Editing Bibliography

Unit V : Hours:15

Methods of Editing General / Scientific Texts

On-Screen Editing

RECOMMENDED TEXTBOOKS:

1. Butcher, *The Cambridge Handbook for Editors Copyeditors and Proof Readers*, Harper Collins, 2006
2. Nichole, Vijay, *Hundred Tests for Copyediting/Technical writing*,

REFERENCE BOOKS:

1. Mohan Krishna, Banerji Meera, *Developing Communication Skills*, Macmillan India Ltd. 2006
2. Dr Pretson, Treat, *The Art of Proof Reading and Editing Your Manuscript The importance of Perfection*, Createspace Independent Pub, US. 2014.
3. John Ageo, *British or American English? A Handbook of word and grammar patterns*, Cambridge University Press, Guttenberg. 2006

4. Geoff Hart, *Effective Onscreen Editing: New Tools for an old Profession*, Diaskevasis Publishing 2011.
5. Alley Michael, *The Craft of Scientific Writing* Fourth Edition, Springer Nature, USA. 2018

JOURNALS:

1. Copy editing and language polishing – Springer.
2. Copy Editing – Open Journal systems.

E-LEARNING RESOURCES:

1. <https://www.britishcouncilfoundation.id/en/english/articles/british-and-american-english>
2. https://www.scribendi.com/advice/what_is_proofreading.en.html
3. <https://www2.le.ac.uk/offices/Id/resources/writing-resources/editing>.
4. <https://www.publishingtrainingcentre.co.uk/downloads/item/on-screen-editing>.
5. <https://authorservices.springernature.com/scientific-editing/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Learners are able to try editing
CO 2	Learners can try proof-reading of articles.
CO 3	Learners develop the ability to differentiate between general editing and scientific texts.
CO 4	Students are skilled in editing bibliography
CO 5	Students can carry out on-screen editing

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5

CO1	2	3	2	2	2
CO2	3	2	3	3	2
CO3	3	3	2	2	3
CO4	3	2	3	3	3
CO5	3	3	2	3	2
AVERAGE	2.8	2.6	2.4	2.6	2.4

KEY: **STRONGLY** CORELATED-3 **MODERATELY** CORELATED-2**WEAKLY** CORELATED-1
NO CORELATION-0

III B.A. SEMESTER – VI

Value Education

TOTAL HOURS: 1 [15 Hours]

COURSE CODE: 174004

CREDITS: 2

UNITS

1. 'Building self-confidence' by Norman Vincent Peale
2. 'Living Excellence' by Anthony Robbins
3. 'Kinds of Values' by S. Ignacimuthu. S.J.
4. 'What is Ethics?' by Swami Vivekananda
5. 'Essential Characteristics of Human Rights' by H. Victor Conde

Text Prescribed:

Fr. Ignacimuthu, Ed. : *Touchstone - Synergy of Values*.

QUAID - E- MILLATH GOVERNMENT COLLEGE FOR WOMEN

(AUTONOMOUS), CHENNAI - 600 002.

ENGLISH DEPARTMENT

M.A. ENGLISH LITERATURE

SYLLABUS



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

(OFFERED FROM THE ACADEMIC YEAR 2017 -2018)

CONTENTS

Rules and regulations for the Programme

Programme Educational Objectives

Programme Outcomes

Programme Specific Outcomes

Programme Profile

Evaluation pattern for CA

Rubrics for CA Evaluation

Evaluation Pattern for End Semester

Course Profile – Semester I

Course Profile – Semester II

Course Profile – Semester III

Course Profile – Semester IV

RULES AND REGULATIONS

M.A. English Literature Syllabus

Choice Based Credit System

Quaid –E–Millath Government College for Women (Autonomous) offers the semester system of education with credits for P.G Courses. Credit is related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures/ tutorials / laboratory work/seminar/project work/practical training/ viva voce etc., to facilitate effective teaching and learning and the credits are assigned accordingly depending on the content and the specialization.

The credit requirement for a two year PG course shall be 91 (81 for Core and Elective & 10 credits for soft skill papers & Internship)

Regulation

1. Duration

- a. There will be two semesters in each academic year. The first academic year shall comprise of the first & second semesters, the second academic year, the third & fourth semesters.
- b. The odd semester shall consist of the period from June to November of each year & the even semester from December to April of each year.

2. Course of Study

a) The course of study for post graduate degree course shall comprise of Core courses

& Electives.

b) System of credits

Year	No. of Papers				Marks	Credits				
	Core	Elective	Extra-Disciplinary Elective	Soft Skill		Core	Elective	Extra-Dis. Elective	Soft Skill	Internship
I Year	7	3	1	2	1300	28	9	3	4	2
II Year	8	2	1	2	1300	32	6	3	4	
Total	15	5	2	4	2600	60	15	6	8	2

Passing Minimum

A candidate shall be declared to have passed in each paper/practical of the main subject of study wherever prescribed if she secures NOT LESS THAN 50% of the marks prescribed for the examinations. She shall be declared to have passed the whole examination, if she passes in all papers & practicals wherever prescribed as per the scheme of examinations earning 90 credits.

Eligibility for the Award of Degree

Candidates must secure a minimum of 50% marks in the Semester End Examinations. A candidate must secure 8 credits in soft skills and 2 credits in internship in addition to 81 credits from core and elective courses to obtain a Post Graduate Degree.

Ranking

Candidates who pass all the examinations prescribed for the course in the **FIRST APPEARANCE ALONE** are eligible for Classification/ Ranking/ Distinction.

The following method be adopted for allotting credit for UG/PG Courses offered in the affiliated colleges as per TANSCHC by this University

PG COURSES

The total credit allotted for **PG COURSES** is **minimum of 90 credits**

Sl. No	Papers	No. of Papers	Credits	Total Credits
1	Core Subjects	15 Papers	4 Credits	60
2	Soft Skills	4 Papers	2 Credits	8
3	*Internship	-	2 Credits	2
	Elective Subjects	5 Papers	3 Credits	15
	Extra Disciplinary Elective Subjects	2 Papers	3 Credits	6
	Total			91

*Internship will be carried out during the summer vacation of the II Semester

The above mentioned distribution structure shall be followed by all colleges and Universities without any alterations

Extra disciplinary subjects should be allocated in the II & III Semester alone for all PG Courses.

PROGRAMME OUTCOMES

POSTGRADUATE ARTS

On Completion of the Programme, the learner is able to:

1. Apply quality skills in all modes

2. Identify the essence of subject knowledge
3. Demonstrate entrepreneur, creative and communication skills
4. Acquire thorough knowledge of the subject
5. Analyze the fundamental research skills

PROGRAMME SPECIFIC OUTCOMES

On completion of the specific programme M.A. English the student will be able to:

1. Assess the spectrum of human experience and gain greater insights into diverse history and cultures of peoples from various continents
2. Acquire a rich content of upcoming critical theories, translation studies, new vocabulary and language structures
3. Formulate newer perspectives of literature
4. Enhance creative skills and appreciate classics, folklore, and world literatures
5. Strengthen ability for research through development of critical thinking and analysis

ROGRAMME PROFILE

M.A. ENGLISH LITERATURE

Se m	Part	Component	Code	Title of the Paper	Cr	Hours /Wk	Total Hours	CA	SE	Total Marks
I	III	Core	175501	British Literature Paper I - Chaucer to Restoration Age	4	6	90	25	75	100
	III	Core	175502	British Literature Paper II- The Augustan Age & The Romantic Age	4	6	90	25	75	100
	III	Core	175503	Indian Literatures in English	4	6	90	25	75	100
	III	Major Elective I	175504	Women's Writings	3	5	75	25	75	100
				Popular Literature						
	III	Major Elective II	175505	Green Studies	3	5	75	25	75	100
				Myth and Literature						
	IV		175001	Soft Skills-I English and Attitudinal skills for Communication	2					
	IV			Library		2	30			
II	III	Core	175506	British Literature Paper III- The Victorian Age	4	5	75	25	75	100
	III	Core	175507	World Literatures in English Translation	4	5	75	25	75	100
	III	Core	175508	Literary Theory and Criticism-I	4	5	75	25	75	100
	III	Core	175509	English Language &Applied Linguistics	4	5	75	25	75	100
	III	Major Elective III	175510	Folklore and Oral Literature	3	4	60	25	75	100
				Cultural Studies						
	III	Extra Disciplinary I	175511	The Art of Writing Short Story	3	4	60	25	75	100
	IV		175002	Soft Skills-II LSRW Skills for Effective Communication	2					
	IV			Library		2	30			
				Internship	2					
	III	Core	175512	Shakespeare	4	5	75	25	75	100
	III	Core	175513	American Literature	4	5	75	25	75	100

III	III	Core	175514	Modernism – Post-Modernism	4	5	75	25	75	100
	III	Core	175515	Literary Theory and Criticism – II	4	5	75	25	75	100
	III	Major Elective IV	175516	Literature for Young Adults	3	4	60	25	75	100
				Biography/Autobiography						
	III	Extra Disciplinary II	175517	Film and Literature	3	4	60	25	75	100
	IV		175003	Soft Skills-III Life Scoping Skills for Success	2					
	IV			Library		2	30			
IV	III	Core	175518	New Literature	4	6	90	25	75	100
	III	Core	175519	English Language Teaching	4	6	90	25	75	100
	III	Core	175520	Project	4	6	90	25	75	100
	III	Core	175521	Marginal Literature	4	5	75	25	75	100
	III	Major Elective V		World Classics in Translation	3	5	75	25	75	100
			175522	An Approach to SET & NET						
	IV		175004	Soft Skills-IV Career Oriented Skills	2					
	IV			Library		2	30			
		Total Credits			91					

EVALUATION PATTERN FOR CONTINUOUS ASSESSMENT – P.G.,

INTERNAL VALUATION BY COURSE TEACHERS

PART I, II AND III

S.No.	COMPONENT	TIME	MAX. MARKS	C.A. MARKS
1	TEST 1	1 HOUR	25 (To be Converted)	20
2	TEST 2	1 HOUR	25 (To be Converted)	20
3	ASSIGNMENT			25
4	MODEL EXAMINATION	3 HOURS	75 (To be Converted)	25
5	ATTENDANCE	90 DAYS PER SEMESTER		10
GRAND TOTAL				100
TOTAL C.A. MARKS REDUCED TO				25

PROJECT

S.No.	COMPONENT	MARKS
1	VIVA VOCE	25

C.A. QUESTION PAPER PATTERN – P.G.,

Knowledge Level	Section	Word Limit	Marks	Total
K1	A – 5 x 2 marks	50	10	25
K1, K2	B – 1 x 5 marks	200	5	
	C – 1 x 10 marks	500	10	

C.A. QUESTION PAPER PATTERN FOR PART IV

Knowledge Level	Section	Word Limit	Marks	Total
K1, K2	A – 1 x 10 marks	350	10	10

RUBRICS FOR CONTINUOUS ASSESSMENT

S.No.	Component	Criteria
1	Assignment	Content Originality Presentation Schematic Representation Diagram Bibliography
2	Seminar	Organisation Subject Knowledge Visual Aids Confidence level Presentation Communication Language
3	Field Visit	Participation Preparation Attitude Leadership

4	Participation	Answering Questions Clearing Doubts Participating in Group Discussions Regular Attendance

END SEMESTER EVALUATION PATTERN – P.G.,

SEMESTER: I/II/III/IV

DOUBLE VALUATION BY COURSE TEACHER AND EXTERNAL EXAMINER

MAXIMUM MARKS: 75

PASSING MARKS: 38

SOFT SKILLS PAPERS

SEMESTER: I/II/III/IV

SINGLE VALUATION BY INTERNAL EXAMINER

MAXIMUM MARKS: 60

PASSING MARKS: 30

PROJECT PAPER

SEMESTER: IV

DOUBLE VALUATION BY RESEARCH SUPERVISOR AND EXTERNAL EXAMINER

DISSERTATION: 75

VIVA-VOCE: 25

MAXIMUM MARKS: 100

PASSING MARKS: 50

INTERNSHIP

SEMESTER IV

YEAR II

MAXIMUM MARKS: 100

PASSING MARKS: 50

SEMESTER I

I M.A. SEMESTER - I

Core British Literature Paper I - Chaucer to Restoration Age

Core British Literature Paper II- The Augustan Age & The Romantic Age

Core Indian Literatures in English

Major Elective I Women's Writings

Popular Literature

Major Elective II Green Studies

Myth and Literature

LIBRARY/SEMINAR/SOFT SKILLS

I M.A. SEMESTER - I

BRITISH LITERATURE PAPER I - CHAUCER TO RESTORATION AGE

TOTAL HOURS: 6 [90 Hours]

COURSE CODE: 175501

CREDITS: 4

COURSE OBJECTIVES

1. To create a wider understanding of writers of the ages
2. To develop the students' knowledge of different literary genres
3. To gain an insight into the writers' world and relating it to the historicity of their works.
4. To provide a background understanding of notions of chivalry, love, spirituality that depict the conventional values of that era.
5. To relate the transition of literary forms from the classical mode to individual modes of expression.

COURSE OUTLINE

UNIT I: POETRY

Hours : 18

Geoffrey Chaucer	:	The Tale of the Wife of Bath from <i>The Canterbury Tales</i>
Edmund Spenser	:	Prothalamion
John Donne	:	The Canonization
Andrew Marvell	:	To His Coy Mistress

John Milton : Paradise Lost Book I Lines 193- 270

UNIT II: PROSE

Hours : 18

Bacon : Of Nobility and Of Superstition

John Dryden : Preface to *All for Love*

UNIT III: DRAMA

Hours : 18

Christopher Marlowe : Tamburlaine

William Congreve : Love for Love

UNIT IV: FICTION / PROSE FICTION

Hours : 18

John Bunyan : *The Pilgrim's Progress* - Chapters 1-4

Sir Thomas Malory : Le Morte d'Arthur (English Translation)

UNIT V: OTHER WRITINGS

Hours : 18

Samuel Pepys- Diary : on The London Plague

Sonnets : Wyatt and Surrey and Spenserian sonnets

RECOMMENDED TEXTBOOKS:

1. Chaucer, Geoffrey. *The Canterbury Tales* Fingerprint Classics : New Delhi 2017
2. Elements of Literature 4th ed. OUP: New Delhi 1991

REFERENCE BOOKS:

1. David Daiches- *A Critical History of English Literature: From the Beginnings to Milton*
2. Compton- Rickett – *A History of English Literature*
3. Alexander, Michael. *A History of English Literature* 2nd ed. Palgrave Foundation Series Macmillan: London 2000
4. Albert, Edward. *A History of English Literature*. 5th ed. OUP: London 1997
5. Prasad, B. *A Background to the Study of English Literature*. Rev.ed. Laxmi Pub: Chennai 2016

JOURNALS:

1. **Hind Litt: A Journal of Literary and Critical Studies. Vol I. July 2014 Tamil Nadu.**
2. **Reformed Journal**

E-LEARNING RESOURCES:

1. <https://www.poetryfoundation.org/poems/45718/paradise-lost-book-1-1674-version>
2. <https://westegg.com/bacon/index.essays.html>
3. <https://www.bl.uk/collection-items/marlowes-the-jew-of-malta>

4.<https://www.aresearchguide.com/le-morte-darthur-summary.html>

5.<https://www.scribd.com/doc/174105818/Contribution-of-Surrey-and-Wyatt-to-English-Sonnet>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	They will receive a better understanding of the authors' works that reflected the society.
CO 2	They will also find the existence of diary writing as a literary form before it was recognised as a genre.
CO 3	Will be able to relate the historicity of the writers' works
CO 4	Will understand the writers' creativity based on their convictions and knowledge
CO 5	Will analyse the experience behind the writers' production of texts

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	3	3

CO2	3	3	2	2	3
CO3	2	2	3	2	3
CO4	3	3	2	3	2
CO5	2	3	2	2	2
AVERAGE	2.6	2.6	2.2	2.4	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1 NO CORELATION-0

I M.A. SEMESTER – I

BRITISH LITERATURE PAPER II- THE AUGUSTAN AGE & THE ROMANTIC AGE

TOTAL HOURS: 6 [90 Hours]

COURSE CODE: 175502

CREDITS: 4

COURSE OBJECTIVES:

1. To enable students to read and appreciate critically the literary works by the major English authors of the Augustan Age
2. To facilitate students to read and appreciate critically the literary works by the major English authors of Romantic Age.
3. To acquaint the students with various important movements of the of the Augustan period, and its salient features.
4. To accustom the students with various important movements of the of the Romantic period, and its salient features.

5. To cultivate among students a sense of understanding in order to make them better human beings by the exposure to literature.

COURSE OUTLINE:

UNIT I: POETRY

Hours: 18

Pope	:	The Rape of the Lock- Canto 3
Gray	:	Ode on the Death of a Favourite Cat
Wordsworth	:	Lucy Gray
Coleridge	:	A Broken Friendship
Southey	:	The Inchcape Rock
Shelley	:	The Cloud
Keats	:	Ode to Autumn

UNIT II: PROSE

Hours: 18

Addison	:	Coverley Ghosts
Lamb	:	Witches, and Other Night-Fears
Hazlitt	:	On the Difference between Writing and Speaking

UNIT III: DRAMA

Hours: 18

Sheridan	:	The School for Scandal
Oliver Goldsmith	:	She Stoops to Conquer

UNIT IV: FICTION

Hours: 18

Defoe	:	Roxana
Jane Austen	:	Emma

UNIT V: SHORT STORIES

Hours: 18

Swift	:	A Voyage to Lilliput from <i>Gulliver's Travels</i>
Mary Shelley	:	The Mortal Immortal.

RECOMMENDED TEXTBOOKS:

Defoe. *Roxana*. London: Penguin Books, 1987.

Goldsmith, Oliver. *She Stoops to Conquer*. New York: Dover Publications, Inc., 1991.

Green, David. *The Winged Word*. Delhi: Macmillan Publishers India Limited, 1974.

Sheridan. *The School for Scandal*. New York: Dover Publications, Inc., 1991.

REFERENCE BOOKS:

Bloom, Edward and Bloom, Lillian (editors). "Addison the Dramatist" in *Joseph Addison and Richard Steele: The Critical Heritage*. Routledge, 1995.

Butler, Marilyn. *Romantics, Rebels and Reactionaries: English Literature and its Background 1760-1830*. London: Oxford, 1985.

Mullan, John. "Swift, Defoe, and narrative forms" in *The Cambridge Companion to English Literature 1650–1740* Ed. Steven Zwicker. Cambridge: Cambridge University Press, 1999.

Nicoll, Allardyce. *A History of English Drama, 1660-1900 - Vol. III Late Eighteenth Century Drama*. Cambridge: CUP, 1970.

Sherbo, Arthur. *Studies in the Eighteenth Century English Novel*. Michigan State University Press, 1969.

JOURNALS:

International Journal of English Literature and Social Science. Vol 2 No 5 Oct. 2017

Journal of English Literature and Cultural Studies. Vol 2 issue 1 2016

E-LEARNING RESOURCES:

[https://courses.lumenlearning.com/britlit1/chapter/transitions-from-augustan-literature-to-the-](https://courses.lumenlearning.com/britlit1/chapter/transitions-from-augustan-literature-to-the-romantics/)

<https://sites.udel.edu/britlitwiki/transitions-from-augustan-literature-to-the-romantics/>

<https://mc.libguides.com/eng/literaryperiods>

<https://poets.org/text/brief-guide-augustans>

CO Number	CO STATEMENT
CO 1	Appreciate critically the works of major English authors of the Augustan Age and the
CO 2	Appreciate critically the works of major English authors of the Romantic Age
CO 3	Identify the various socio-historic cultural background of the respective periods, and their salient features
CO 4	Develop a sense of understanding to be better human beings by the exposure to literature
CO 5	Recognise the emergence of an indigenous genre which flourished as the most popular genre ever since called novel

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	3	2	3
CO2	3	3	3	2	3
CO3	2	3	2	2	2
CO4	3	2	2	2	2
CO5	2	2	2	3	2
AVERAGE	2.4	2.4	2.4	2.2	2.4

I M.A. SEMESTER – I

INDIAN LITERATURES IN ENGLISH

TOTAL HOURS: 6 [90 Hours]

COURSE CODE: 175503

CREDITS: 4

COURSE OBJECTIVES:

1. To familiarize students to wide range of Indian writing originally written in English and translated from Indian languages.
2. To acquaint students to wide range of Indian writing translated from Indian languages to English.
3. To make the study of English Literature more relevant and contextualized.
4. To provide an awareness of the cultural and literary heritage of India as reflected in Indian writing in English.
5. To enable the students to understand, appreciate and evaluate Indian authors

COURSE OUTLINE:

UNIT I: POETRY

Hours: 18

Tagore	:	Songs 10, 11, 50, 51 from <i>Gitanjali</i>
Shiv K Kumar	:	Indian Women
Agha Shahid Ali	:	The Floating Post Office
Tishani Doshi	:	The Day We Went to the Sea
Subramanya Bharathi	:	There is No Fear (Tamil)
Mangalesh Dabral	:	Old Photographs (Hindi)
U.R. Ananthamurthy	:	The Wrinkles on Grandpa's Shoulder (Kannada)
Arun Kolatkar	:	The Turnaround (Marathi)

UNIT II: PROSE

Hours: 18

Ananda Coomaraswamy	:	Dance of Shiva
S.Muthiah	:	The Mystery of the Woman in the North River - from

*Madras
Rediscovered*

UNIT III: DRAMA

Hours: 18

Mahesh Dattani	:	Seven Steps around the Fire
Vijay Tendulkar	:	Kamala

UNIT IV: FICTION

Hours: 18

Aravind Adiga	:	The White Tiger
Sudha Murthy	:	Gently Falls the Bakula

UNIT V: SHORT STORIES

Hours: 18

Anita Desai	:	The Domestic maid
Mahaswetha Devi	:	Draupadi

RECOMMENDED TEXTBOOKS:

Aravind. Adiga. *The White Tiger*. New York: Free Press, 2008.

Dangle, Arjun. *Poisoned Bread*. New Delhi: Orient Black Swan, 2009.

Dattani, Mahesh. *Collected Plays* Volume 2. New Delhi: Penguin Books, 2005.

Tendulkar, Vijay. *Five Plays*. Bombay : Oxford UP, 1995.

REFERENCE BOOKS:

Iyengar .R.Srinivasa. *Indian Writing in English*. New Delhi: Sterling Publishers Private Limited, 1983.

Mehrotra, Arvind Krishna. Ed. *Illustrated History of Indian Literature in English*. New Delhi: Orient Longman, 2003.

Naik, M.K, ed. *Aspects of Indian Writing in English*. New Delhi: Macmillan India Limited, 1982.

Tharu, Susie and K. Lalitha. Ed. *Women Writing in India Vol. 1& II*. OUP, New Delhi, 1991.

Williams, H.M. *Indo-Anglian Literature, 1800-1970: A Survey*. New Delhi: Orient Longman,1976.

JOURNALS:

International Journal of English Language, Literature in Humanities. Vol 6 No 8 (2018): Volume 6, Issue 8 August 2018

International Journal of Research -Granthaalayah. Vol.5 (Iss.5: SE): May, 2017.

IOSR Journal Of Humanities And Social Science (IOSR-JHSS) Volume 20, Issue 4, Ver. 1 (Apr. 2015).

E-LEARNING RESOURCES

http://www.academia.edu/Documents/in/Mahasweta_Devi

<https://journalijcar.org/issues/psycho-acoustical-trauma-select-novels-anita-desai>

[https://www.researchgate.net/publication/262802734_Anita_Desai's_Novels_as_Post Modernist](https://www.researchgate.net/publication/262802734_Anita_Desai's_Novels_as_Post_Modernist)

<http://joell.in/wp-content/uploads/2017/11/Female-Characters-In-Sudha-Murthy%E>

http://www.academia.edu/Documents/in/Aravind_Adiga

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Demonstrate a better understanding of the wide range of Indian literatures of different genres originally written in English.
CO 2	Display a better appreciation of the wide range of Indian literatures of different genres originally written in Indian languages and translated to English.
CO 3	Identify the socio- cultural and literary heritage of India as reflected in Indian literatures in English.
CO 4	Acquire knowledge about the various theories in Indian literatures in English.
CO 5	Understand, appreciate and evaluate Indian authors.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	2	3	3
CO2	2	2	2	3	3
CO3	3	3	3	2	2
CO4	2	2	3	2	2
CO5	3	3	2	2	3
AVERAGE	2.4	2.4	2.4	2.4	2.6

I M.A. SEMESTER – I

WOMEN'S WRITINGS (Major Elective I)

TOTAL HOURS: 5 [75 Hours]

COURSE CODE: 175504

CREDITS: 3

COURSE OBJECTIVES:

1. To introduce students to works written by women.
2. To sensitize the students to women's issues around the world.
3. To introduce them to the history of women's Liberation movement/the feminist movement, the pioneers of the movement, their landmark writings and the role of the movement in alleviating the conditions of women.
4. To introduce them to the various strands of feminism.
5. To make them sensitive to the heterogeneous voices of women.

UNIT I

Hours: 12

Introduction to feminism: Its beginnings, the three waves of feminism, the demands of the movement, radical feminism, liberal feminism, lesbian feminism, Marxist feminism, post feminism, ecofeminism, cyberfeminism from *Feminisms an Introduction*.

PROSE:

Betty Friedan	:	The Problem that Has No Name - from <i>Feminine Mystique</i>
Chimamanda Adichie	:	We should All be Feminists

UNIT II: POETRY

Hours: 14

Judith Wright	:	Eve to Her Daughters
Adrienne Rich	:	Aunt Jennifer's Tigers
Gwendolyn Brooks	:	Jessie Mitchell's Mother
Gladys Cardiff	:	Combing
Supata Bhattacharya	:	Draupadi

Bilqis Zafirul Hasan	:	Dignity
Julia Alvarez	:	Women's Work
Patricia Lockwood	:	Rape Joke

UNIT III: DRAMA

Hours: 18

Manjula Padmanabhan	:	Lights Out
Maishe Maponya	:	Umongikazi/The Nurse

UNIT IV: FICTION

Hours: 19

Sue Monk Kidd	:	The Secret Life of Bees
Nawal-Al-Saadawi	:	Woman at Point Zero

UNIT V: SHORT STORIES

Hours: 12

Farkhanda Lodhi	:	The Poor Thing
Lalithambika Antharjanam	-	Admission of guilt

Recommended Texts :

1. Sarah Gamble, ed.. *The Routledge Companion to Feminism and Postfeminism*. USA: Routledge, 2001.
2. Miriam Schnier. *The Vintage Book of Feminism: The Essential Writings of Contemporary Women's movement*. Vintage, 1995.

Books for Reference :

1. Annapoorani S. and V. Bharathi Harishankar, Eds. "Shifting Perceptions An Anthology of Women's Writing". Chennai: mainspring Publishers, 2016.
2. Lalithambika Antharjanam. *Cast Me Out If You Will Stories and Memoir*. Calcutta: Mandira Sen for Stree, 1998.
3. Betty Friedan. *The Feminine Mystique*. US: Norton and Co, 1963.
4. Claramma Jose. *Feminisms An Introduction*. Chennai: Self Published, 2005.
5. Yasmin Hameed and Asif Aslam Farrukhi, Eds.. *Pakistani Women Writers*. New Delhi: Ajantha Books, 2002.
6. Kathy A. Perkins, Ed. *Black and South African Women: An Anthology of Plays*. London: Routledge, 1998.

Journals

1. Indian Journal of Gender Studies. Sage Journals.
2. Feminist Theory. Sage journals
3. International Journal of Gender and Women's Studies.

Eresources

1. www.unwomen.org
2. www.genderwatch.org
3. www.gendercawater
4. ncw.nic.in
5. www.progressivewomensleadership.com

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Appreciate women writers from various cultures and countries across the world
CO 2	Recognize their own rights as women and their worth as human beings with equal status with men in society
CO 3	Acquire a thorough knowledge of the women's liberation/feminist movement with its landmark writings
CO 4	Sensitive to the issues of women from various backgrounds and to their heterogeneous voices.
CO 5	Familiar with contemporary feminist theories

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3

CO2	1	2	2	2	2
CO3	2	3	3	3	3
CO4	3	2	3	3	3
CO5	2	3	2	3	3
AVERAGE	2.2	2.4	2.6	2.8	2.8

I M.A. SEMESTER – I

POPULAR LITERATURE (Major Elective I)

TOTAL HOURS: 5 [75 Hours]

COURSE CODE:

CREDITS: 3

COURSE OBJECTIVES

1. To introduce the students to popular and mass culture
2. To explain the distinction between high and popular culture.
3. To introduce the students to popular literature
- 4.To familiarize the students to various forms of popular literature

5.To introduce the students to various theories of popular literature

COURSE OUTLINE

UNIT I : Hours: 15

Leslie Fiedler : Towards a Definition of Popular Literature - from
Super Culture: American Popular Culture and Europe
Raymond Chandler : The Simple Art of Murder.

UNIT II : Hours: 15

Anton Chekhov : The Boor
William Gibson : The Miracle Worker

UNIT III : Hours: 15

Edgar Allan Poe : The Cask of Amontillado
Sir Arthur Conan Doyle : The Red Headed League

UNIT IV : Hours: 15

Louis L' Amour : War Party
Arthur C. Clarke : 2001: A Space Odyssey

UNIT V : Hours: 15

Daphne Du Maurier : Rebecca

Recommended Texts

1. Leo Lowenthal. Literature, *Popular Culture and Society*. Prentice-Hall, 1961
2. Robert L. Root.. *The Rhetorics of Popular Culture*. Greenwood Press, 1987.

Books for Reference

1. Caweti, John G. *Adventure, Mystery and Romance: Formula stories as Art and Popular Culture*. Chicago: University of Chicago Press, 1976.
2. INGE, m. THOMAS. *Handbook of American Popular Literature*. New York: Greenwood Press, 1988.
3. Dominic Strinati. *An Introduction to Theories of Popular Culture*. Routledge, 2004.
4. Carla A. Freccero. *Popular Culture: an Introduction*. NYUP, 1997.
5. Dominic Strinati. *An Introduction to Studying Popular Culture*. Psychology Press, 2000.

Journals

1. Americana: The Journal of American Popular Culture.
2. East Asian journal of Popular Culture.

Eresource

1. www.jstor.org
2. www.journalofpopularculture.com
3. <http://literariness.org>
4. www.jltonline.de
5. www.tezu.ernet.in

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand the significance of popular culture and literature

CO 2	Understand the distinction between high and popular culture
CO 3	Appreciate literature in various popular forms
CO 4	Acquire knowledge about the various theories in popular literature
CO 5	Explore the unique features of popular literature through exemplary works in this area

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	2	3	3	3	2
CO3	3	2	3	3	2
CO4	2	3	2	2	2
CO5	2	3	3	3	3
AVERAGE	2.4	2.8	2.8	2.6	2.4

I M.A. SEMESTER - I

GREEN STUDIES (Major Elective II)

TOTAL HOURS: 5 [75 Hours]

COURSE CODE: 175505

CREDITS: 3

COURSE OBJECTIVES

1. To sensitize the students about ecological issues
2. To discuss the connection between literature and ecology.
3. To discuss how nature and ecological issues are being represented in literature.
4. To introduce the students to the concepts of environmental justice and sustainable development.
5. To introduce the students to contemporary theories in eco-criticism

COURSE OUTLINE

UNIT I

Hour: 15

Introduction to green studies, literary ecology, ecocriticism, ecopoetics, ecosophy-deep and shallow ecology, ecofeminism, bioregionalism, Tinai, Oikopoetics-Oikos-Intergrative, hierarchic and anarchic, environmental justice.

William Rueckert	:	Literature and Ecology
Maria Mies and Vandana Shiva	:	Ecofeminism
Nirmal Selvamony	:	Tinai Studies

UNIT II: POETRY

Hour: 10

A.K. Ramanujan- (1) What she Said to her Girlfriend-Akananuru 82 (Kurunci)., (2) What Her Girlfriend Said to Him (on Her Behalf) When he came by Daylight-Narirnai 172 (Neytal), (3) What her girlfriend Said-Akananuru 111 (Palai), (4) What He Said to His Charioteer, on His Way Back-Aingkurunuru 134 (Mullai) (5) What She Said-Aingkurunuru 11 (Marutam).

William Wordsworth	:	The World is Too Much with Us
P.B Shelley	:	Ode to the West Wind
William Blake	:	The Fly
D.H. Lawrence	:	The Snake
Dylan Thomas	:	The Force that Through the Green Fuse
Gordon J.L Ramel	:	Wetlands

UNIT III: PROSE/DRAMA:

Hour: 20

Prose:

Rachel Carson	:	A Fable for Tomorrow
Chief Seattle	:	1854 Oration
Arundhati Roy	:	The Greater Common Good

Drama:

Mahasweta Devi	:	Water

UNIT IV: FICTION:

Hour: 15

Edward Abbey	:	The Monkey Wrench Gang.

UNIT V: SHORT STORIES:

Hour: 15

A.K Ramanujam	:	A Flowering Tree
Ernest Hemmingway	:	The Snows of Kilimanjaro
Ambai	:	A Kitchen in the Corner of the House

Recommended texts

1. Laurence Coupe, Ed. *The Green Studies Reader: From Romanticism to Ecocriticism*. London: Routledge, 2000.
2. Cheryll Glotfelty and Harold Fromm, Eds. *The Ecocriticism Reader Landmarks in Literary Ecology*. Athens: University of Georgia Press, 1996.

Books for Reference

1. Ambai. *A Purple Sea*. Chennai: East West Books Private Ltd, 1998.
2. Rachel Carson. *Silent Spring*. US: Houghton Mifflin, 2002.
3. Timothy Clark. *The Cambridge Introduction to Literature and the Environment*. New York: Cambridge University Press, 2011.
4. Nirmal Dasan and Nirmal Selvamony, Eds. *Tinai*. Nov. 2003-Jul 2004.
5. Mahasweta Devi. *Five Plays*. Trans. Samik Bandyopadhyay. Calcutta: Seagull, 2008.
6. Sandra Kemp and Judith Squires, Eds. *Feminisms*. London: OUP, 1997.
7. A.K Ramanujam. *Interior Landscape*. London: Peter Owen, 1970.
8. A.K. Ramanujam. *A Flowering Tree and Other Oral Tales from India*. London: University of California Press, 1997.
9. Kirkpatrick sale. "Bioregionalism". *The Green Studies Reader Toward a Sustainable Society*. Ed. Andrew Dobson. San Francisco: Mercury House Incorp, 1991.

Journals:

- 1 . Indian Journal of Ecocriticism
- 2 . Canary-USA

Eresources

1. www.academicoup.com

2. flyway.org
3. www.environmentandsociety.org
4. www.ecozona.eu
5. www.un.org/sustainabledevelopment

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Comprehend the issues concerning the environment
CO 2	Understand the importance of preserving ecological balance
CO 3	. Explore the ways in which nature and environment are represented in literature
CO 4	Delve into the concepts of environmental justice and sustainable development
CO 5	. Familiar with contemporary theories in ecocritics

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	2	3
CO2	2	2	3	2	2
CO3	3	2	3	2	3
CO4	2	2	3	3	3
CO5	2	3	3	3	3
AVERAGE	2.4	2.2	3	2.4	2.8

I M.A. SEMESTER – I

MYTH AND LITERATURE (Major Elective II)

TOTAL HOURS: 5 [75 Hours]

COURSE CODE:

CREDITS: 3

COURSE OBJECTIVES

1. To introduce the students to the concepts of myth, legend and fable
2. To expound the relationship between myth and literature.
3. To introduce the students to the mythologies of various cultures.

4. To expose her to the representations of mythologies in various genres of literature.
5. To familiarize her to various theories of myths.

COURSE OUTLINE

UNIT I: Hours: 15

Northrop Frye	: The Archetypes of Literature
Introduction in Thomas Bullfinch	: The Age of Fable

UNIT II: Hours: 15

Stories from Greek Epics	: Homer's Illiad --The Trojan War, Ulysses
Virgil's Aeneid	: Adventures of Aeneas

UNIT III: Hours: 15

Prometheus and Pandora
 Python
 King Midas
 Narcissus
 Perseus & Medusa
 The Sphinx
 The Centaurs, The Pygmies, The Griffin
 Medea and Golden Fleece
 Hercules

UNIT IV: Hours: 15

King Arthur and The Knights of the Round Table

UNIT V: Hours: 15

Joseph Brucher (retold)	:	Racing the great Bear (Red Indian)
Robert D.Sam(retold)	:	Otoonah (Eskimo)
Mary Pope Osborne	:	Pecos Bill (Mexican)

Recommended texts

1. Mc. Howatson. *Oxford Companion to Classical Literature*. 3rd Ed.. OUP, 2011.

2. Northrop Frye. *Anatomy of Criticism*. Princeton UP, 1957.

Books for Reference

1. Thomas Bulfinch. *Age of Fable*. (1855). Lulu Press Inc, Reprint 2013.
2. Sir James George Frazer. *The Golden Bow*. (1890). Dover Publications Incorp, Reprint 2002.
3. Edith Hamilton. *Mythology*. (1942). Penguin Books, Reprint 1969.
4. Jenny March. *The Penguin Book of Classical Myths*. Penguin, 2008.
5. Jackson Crawford. *The Poetic Edda: Stories of the Norse Gods and Heroes*. Hackett Classics, 2015

Journals

1. Mythological Studies journal.
2. Amaltea

Eresource

1. www.immanencejournal.com

2. www.writework.com

3. <http://mcl.as.uky.edu>

4. www.academia.edu

5. www.literarydevices.com myth

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand the concept of myth and mythology
CO 2	Understand the relationship between myth and literature
CO 3	Familiar with theories of myth and archetypes

CO 4	Fathom the archetypal, myth and folk forms of literature
CO 5	.Appreciate the mythologies of various people

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	3	2	3
CO2	2	3	3	3	3
CO3	2	3	3	3	2
CO4	2	3	3	3	3
CO5	3	2	3	3	3
AVERAGE	2.2	2.8	3	2.8	2.8

ENGLISH AND ATTITUDINAL SKILLS FOR COMMUNICATION

PURPOSE

To enhance holistic development of students and improve their employability skills

INSTRUCTIONAL OBJECTIVES

1. To develop inter personal skills and be an effective goal oriented team player
2. To develop professionals with idealistic, practical and moral values
3. To develop communication and problem solving skills
4. To re-engineer attitude and understand its influence on behavior

UNIT I – SELF ANALYSIS

Definition – Self-analysis –methods- Importance of self-analysis –SWOT analysis – Johari window- who am I – Attributes – Importance of self confidence, Self esteem ,self awareness components- Improving self-awareness – Benefits of understanding self

UNIT II – CREATIVITY

What is Creativity – Creativity manifest in the work environment – Importance of creativity – Techniques for creativity- Brainstorming – Out of box thinking – Lateral thinking

UNIT III – MOTIVATION

Definition – Factors of motivation- Importance of motivation-Steps in the motivational process – classification of motivation – Elements of motivation techniques and strategies for self motivation – Seven rules of motivation –Maslow hierarchy of needs – Demotivating factors

UNIT IV – ATTITUDE

Definition- Factors influencing attitude – challenges – Bad Vs Good attitude – Benefits of positive attitudes- Factors influencing attitude – challenges and lessons from attitude – Etiquette.

UNIT V – GOAL SETTING Definition – Goal Setting – Short medium and long term goals –

Importance of goal setting – choices / selection of goal setting – Steps for goal setting-SMART goal – wish list – Blue print for success. Time management – Value of time-Diagnosing time management – Weekly planner to do list prioritizing work .

TEXT BOOKS:

Soft skills, 2016, Career Development Centre, Green pearl publication

REFERENCE

1. Covey Sean , Seven Habits of Highly Effective Teens, New York Fireside
Publishers,19
98
2. Carnegie Dale, How to win friends and Influence people ,New York : Simon &
Schuster,1
998
3. Thomas A Harris, I am ok you are ok , New York- Harper and Row,1972
4. Daniel Coleman, Emotional Intelligence, Bantam Book,2006

SEMESTER II

M.A. SEMESTER - II

Core	British Literature Paper III- The Victorian Age
Core	World Literatures in English Translation
Core	Literary Theory and Criticism- I
Core	English Language & Applied Linguistics
Major Elective III	Folklore and Oral Literature
	Cultural Studies
Extra Disciplinary I	The Art of Writing Short Story

M.A. SEMESTER – II

BRITISH LITERATURE PAPER III- THE VICTORIAN AGE

TOTAL HOURS:5 [75 Hours]

COURSE CODE: 175506

CREDITS: 4

COURSE OBJECTIVES

OBJECTIVES:

1. To acquaint students with major trends and writers in English literature through detailed study of specific literary works of different genres in the Victorian age.
2. To interpret the socio-historic and cultural background of the Victorian age.
3. To introduce students to various literary forms in poetry, prose and drama that are popular in the Victorian age through a study of representative writers.
4. To expose the students to the genre of short fiction written extensively during this period.
5. To enable students to read and appreciate critically the literary works by the major English authors of the Victorian Age.

COURSE OUTLINE

UNIT I: POETRY

Hours: 16

Tennyson	:	A Farewell
Robert Browning	:	Love among the Ruins
Arnold	:	Growing Old
Hopkins	:	The Handsome Heart
Christina Rossetti	:	The Poor Ghost
Barrett Browning	:	A Dead Rose
Swinburne	:	A Child's Laughter
Morris	:	Haystack in the Floods

UNIT II: PROSE

Hours: 15

John Ruskin	:	Sesame: Of King's Treasuries para 1 to 20

T. B. Macaulay : We must look forward to a time when Indians will hold high
Offices - from *Government of India*

UNIT III: DRAMA

Hours: 17

Thomas Brandon : Charley's Aunt

Oscar Wilde : Lady Windermere's Fan

UNIT IV: FICTION

Hours: 15

Thomas Hardy : Mayor of Caster Bridge

Emily Bronte : Wuthering Heights

UNIT V: SHORT STORIES

Hours: 12

Dickens : The Haunted House

Wilkie Collins : Who Killed Zebedee

RECOMMENDED TEXTBOOKS:

Bronte, Emily. *Wuthering Heights*. New Delhi: Finger Print, 2017.

Hardy, Thomas. *Mayor of Caster Bridge*. New York: Penguin Random House, 2016.

Negri, Paul. *English Victorian Poetry: An Anthology*. New York: Dover Publication, Inc., 1999.

Wilde, Oscar. *Lady Windermere's Fan*. Noida: Maple Press, 2016.

BOOKS FOR REFERENCE:

Kettle, Arnold. *An Introduction to the English Novel - Volume I: Defoe To George Eliot*. London: Harper & Brothers, 1980.

Nicoll, Allardyce. *A History of English Drama, 1660-1900 - Vol. IV Late Nineteenth Century Drama*. London: CUP, 1975.

Rose Murfin & Supriya M. Ray. *A Bedford Glossary of Critical and Literary Terms*. New York: Macmillan, 1998.

Sanders, Andrew. *The Short Oxford History of English Literature*. Oxford: Clarendon Press, 1994.

Willy, Margaret. *A Critical Commentary on Emily Bronte's "Wuthering Heights"*. New York: Macmillan, 1966.

JOURNALS:

Project Muse Volume 57 number 1 Spring 2019.

WR: *Journal of the Arts & Sciences Writing Program* Issue 2, 2009–2010.

E-LEARNING RESOURCES

<https://www.bl.uk/romantics-and-victorians/articles/an-introduction-to-lady-windermere-fan>

<http://oscarwilde-society.co.uk/publications/the-wildean/>

<https://www.jstor.org/journal/victpoet>

<https://www.questia.com/library/p75260/victorian-poetry>

<https://www.jstor.org/journal/victlitcult>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Display a working knowledge of the social, historical and cultural contexts of British literature in the Victorian Age
CO 2	Identify and describe distinct literary characteristics of British literature of different genres in the Victorian Age
CO 3	Exhibit an in depth knowledge of the development of various genres during the Victorian age.
CO 4	Appreciate the aesthetics of literature through a study of representative writers.
CO 5	Develop a sense of understanding of human relations and values by the exposure to literature in the Victorian Age

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	2	2	2
CO2	2	2	3	2	3
CO3	2	2	3	3	2
CO4	2	2	2	2	3
2CO5	3	3	2	2	3

AVERAGE	2.2	2.4	2.4	2.2	2.6

I M.A. SEMESTER - II

WORLD LITERATURES IN ENGLISH TRANSLATION

TOTAL HOURS: 5 [75 Hours]

COURSE CODE: 175507

CREDITS: 4

COURSE OBJECTIVES

1. To introduce the students to non-English speaking literatures written around the world.
2. To introduce them to the works of some of the Nobel Prize winners for literature.
3. To emphasise the fact that literatures other than English exist.
4. To sensitize them to the various cultures, issues and voices of the world.
5. To introduce the students to contemporary critical theories from around the world.

COURSE OUTLINE

UNIT I: PROSE

Hours: 15

Svetlana Alexievich (Russia)	:	On the Battle Lost – The Nobel Prize Lecture
Yu Hua	:	Copycat - from <i>China in Ten Words</i> (China)
S. Muthiah	:	In the Curves of The Coom (India)

UNIT II: POETRY

Hours: 16

Tomas Transtromer	:	The Indoors is Endless (Sweden)
Wisława Szymborska	:	Dreams (Poland)
Gagan Gill	:	Here (India)
Kapardeli Eftichia	:	A City one Wish (Greek)
Jaroslav Seifert	:	A Chaplet of Sage (Austria)
Mahmoud Darwish	:	As He Walked Away (Palestine)
Pablo Neruda	:	Death Alone (Chile)
Yahia Al-Samawy	:	Don't Light the Candles (Iraq)

UNIT III: DRAMA**Hours: 17**

Bertolt Brecht	:	Mother Courage and Her Children (German)
Eugene Ionesco	:	Rhinoceros (France)

UNIT IV: FICTION**Hours: 15**

Yasunari Kawabata	:	Thousand Cranes (Japan).
Gabriel Garcia Marquez	:	One Hundred Years of Solitude (Columbia)

UNIT V: SHORT STORIES**Hours: 12**

So Kiwon	:	The Heir (Korea)
Rosario Ferre	:	The Youngest Doll (Puerto Rico)
Yasmin Marri	:	The Poison of the Blue Rose (Baluch)

Recommended Texts

1. Frank N. Magill. *Masterpieces of world Literature*. Collins, 1991.

2 Lillian Herlands and et al, eds. *Reader's companion to World Literature*. Signet books,
2002.

Books for reference

1. Arthur N. Aplebee. *Contemporary Short Stories*. Illinoise: McDoughal Littell and Co,
1993.

2. Yasmin Hameed and Asif Aslam Farrukhi, Eds..*Pakistani Women Writers*. New Delhi:
Ajantha Books, 2002.

3. Yu Hua. *China in Ten Words*. Trans. Allan H. Barr. Beijing: Knopf Doubleday,
2011.

4. J.D. McClatchy. *The Vintage Book of World poetry*. Vintage.

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Explore the contemporary non-English literatures from around the world including popular Nobel Prize books
CO 2	Understand the role of translation in rendering the non-English speaking world literatures accessible to them
CO 3	Realize how translations have enhanced and enriched the English language and literature
CO 4	Explore various cultural practices and social conditions and issues through literature which broaden their perspectives and worldviews, creating respect for other cultures and worldviews without passing value judgments
CO 5	Familiar with the current trends in world literatures.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	2	3
CO2	2	2	2	3	2
CO3	2	2	2	3	2
CO4	3	2	3	3	3
CO5	2	3	3	3	3
AVERAGE	2.4	2.2	2.6	2.8	2.6

I M.A. SEMESTER – II

LITERARY THEORY AND CRITICISM – I

TOTAL HOURS:5 [75 Hours]

COURSE CODE: 175508

CREDITS: 4

COURSE OBJECTIVES:

1. To create an overview of criticism of all ages, Eastern and Western.
2. To understand the various perspectives in criticism.
3. To relate theory with its application on different texts.
4. To analyse the concepts discussed in the texts
5. To develop critical thinking and understanding of the texts

UNIT I: CLASSICAL CRITICISM

Hours: 15

Aristotle : Concept of Tragedy and Comedy Part V and VI

-

from
Poetics

Horace : *Ars Poetica* Part II

UNIT II: SEVENTEENTH AND EIGHTEENTH CENTURY CRITICISM Hours: 15

Sidney: Part II	:	The Argument - from <i>An Apologie for Poetry</i>
Samuel Johnson	:	Shakespeare's excellence as a poet - from
<i>Preface to</i>		<i>Shakespeare</i>
		<i>re</i>
William Wordsworth	:	<i>Preface to Lyrical Ballads</i> p 81 – 88

UNIT III: NINETEENTH CENTURY AND TWENTIETH CENTURY CRITICISM

Hours: 15

Matthew Arnold	:	Function of Criticism at the Present Time
Edgar Allan Poe	:	The Philosophy of Composition
John Crowe Ransom	:	The New Criticism

UNIT IV: INDIAN POETICS – EARLY PERIOD

Hours: 15

Dhananjaya	:	Definitions and Descriptions in Drama
Sri Aurobindo	:	The Sources of Poetry and The Essence of Poetry

UNIT V: INDIAN POETICS – RECENT PERIOD

Hours: 15

K. Satchidanandam	:	Dilemmas of Indian Literary Criticism - from <i>FRONTLINE</i> , March 2014
Makarand R. Paranjape	:	The Reluctant Guru: R.K. Narayan and The Guide

RECOMMENDED TEXTBOOKS:

1. Leitch, Vincent B. Ed. *The Norton anthology of Theory and Criticism*. 3rd ed. W.W.Norton and Company Inc. : New York 2018
2. Ramaswami , S. And V.S.Sethuraman. *The English Critical Tradition: An Anthology of English Literary Criticism* Vol 1 Macmillan India Ltd.: Madras 1986

REFERENCE BOOKS:

1. Lodge, David. *20thC Literary Criticism*. Longman Publishers: London 1972
2. Devy, G.N. *Indian Literary Criticism*. 2nd ed. Orient Blackswan: Chennai 2010

3. Agnihotri, Ramakant ed. *Indian English: Towards a New Paradigm*. Orient Blackswan Pvt. Ltd.: India 2017
4. Wimsatt, William K .and Cleanth Brooks. *Literary Criticism: A Short History*. OUP: New Delhi 1957
5. Waugh, Patricia. *Literary Theory and Criticism*. South Asia Edition. OUP: New Delhi 2014

JOURNALS:

1. Journal – South Asian Review VOL 24 Issue 2 2003
2. Academic.edu 2017 web

E-LEARNING RESOURCES:

1. <https://pdfs.semanticscholar.org/1f8f/18187a8f993451b38165aab239acd498c1f8.pdf>
2. <https://www.bartleby.com/39/30.html>
3. <https://www.poetryfoundation.org/articles/69390/the-philosophy-of-composition>
4. https://frontline.thehindu.com/columns/K_Satchidanandan/dilemmas-of-indian-literary-criticism/article5739887.ece
5. <http://savitri.in/blogs/light-of-supreme/the-sources-of-poetry-by-sri-aurobindo-1>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	The student shall have a framework of understanding the criticisms of the west and the east
CO 2	The student shall gain insight into the diverse perspectives of all texts
CO 3	Shall attempt to apply the concepts on texts under study
CO 4	Shall relate theory and its application
CO 5	Shall gain analytical skills

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	3
CO2	2	2	3	3	3

CO3	3	3	2	2	2
CO4	2	2	3	2	2
CO5	3	2	3	3	3
AVERAGE	2.6	2.2	2.6	2.4	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1 NO CORELATION-0

I M.A. SEMESTER – II
ENGLISH LANGUAGE AND APPLIED LINGUISTICS

TOTAL HOURS: 5 (75 Hours)

COURSE CODE:175509

CREDITS:4

COURSE OBJECTIVES:

1. To offer a scientific study of English language and its phonetic aspects.
2. To expose the students to a better understanding of the language through a diachronic study.
3. The students must know the linguistic features that can be applied or corroborated with their native language.
4. To obtain an indepth analysis of all technical aspects in language and literature
5. To understand various aspects of language and linguistics.

COURSE OUTLINE:

UNIT I: INTRODUCTIUON

Hours: 15

Origin of Language

Change of Meaning

Evolution of Standard English

UNIT II: PHONETICS AND PHONOLOGY

Hours: 15

Consonants, Vowels and Diphthongs and their classification

Rhythm, Word Accent, Stress, Intonation

Transcription of Sentences

UNIT III: MORPHOLOGY

Hours:16

Morph, Morpheme, Allomorph, Morphological processes, Compounds, Analyzing Morphological Structure, Word classes, Morphological Properties of English verbs, Word Formation.

UNIT IV: SYNTAX & SEMANTICS**Hours:16**

Traditional, Structural, Phrase Structure Grammar, Transformational Grammar

UNIT V: APPLIED LINGUISTICS**Hours:13**

Contrastive Analysis, Error Analysis

Stylistics Contrastive Error

GRAMMAR USAGE

Sentence Structure

Discourse Markers – Ambiguity

RECOMMENDED TEXTBOOKS:

1. Palmer, Frank. *Grammar* Penguin: New Delhi 1971
2. T. Balasubramaniam *A Textbook of English Phonetics for Indian Students* Macmillan: New Delhi 1981

REFERENCE BOOKS:

1. Carroll, J. *Systems and Structures*. OUP: Madras 1971
2. Crystal, David. *Linguistics* Penguin Pub.: London 1990
3. M English Usage Macmillan: Madras 1975
4. Wood, F.T. *An Outline History of English Language* Macmillan : New Delhi 2000
5. Yule, George. *The Study of Language* 3 rd ed. CUP : Cambridge 2006

JOURNALS:

1. Journal of English Language Teaching
2. Springer

E-LEARNING RESOURCES:

1. <https://www.journals.elsevier.com/journal-of-phonetics>
2. <https://www.journals.elsevier.com/journal-of-phonetics>
3. <https://link.springer.com/journal/11525>
4. <https://semprag.org/index.php/sp>
5. <https://journals.equinoxpub.com/index.php/JAL>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	The learners will get a better knowledge of English through phonetics.
CO 2	The learners will be able to get a comprehensive perspective on the linguistic features that have contributed towards the growth of the language.

CO 3	Will understand and describe the historical development of the language
CO 4	Comprehend the Core areas of language analysis
CO 5	Gain an understanding of all technical aspects in language.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	2	3	2
CO2	3	2	3	2	3
CO3	2	3	2	3	2
CO4	3	2	3	2	3
CO5	3	2	2	3	3
AVERAGE	2.6	2.4	2.4	2.6	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1 NO CORELATION-0

I M.A. SEMESTER – II

FOLKLORE AND ORAL LITERATURE

TOTAL HOURS: 4(60 Hours)

COURSE CODE:175510

CREDITS: 3

COURSE OBJECTIVES:

1. This paper has been an innovative one for students to understand different cultures of the world.
2. The students will observe a multidimensional aspect of culture and life through the art of storytelling.
3. To create an awareness of world literature
4. To understand the values insisted by the tales prescribed here.
5. To heighten the creative skills of the students and to analyse the creativity of the authors.

COURSE OUTLINE:**UNIT I: BACKGROUND STUDY:****Hours:12**

1. Oral Tradition and History 2. Folklore and Globalisation 3. The future of Folklore in the new Millenium 4. Folklore, Oral tradition and Local History – from *Folklore in the New Millenium*

UNIT II: INDIGENOUS FOLKLORE**Hours:13**

The Chief who was no fool (African tale)

White Crow hides the Animals (kiowa- Native American)

Maui and the Giant Fish (Maori- New Zealand)

The boy in the land of Shadows (Canadian)

The Bunbundoolooeys (Australia)

UNIT III: EUROPEAN FOLKLORE**Hours:13**

The Battle of the Birds : Celtic

The Fisherman and his Wife : Germania

The Voice of Death : Romanian

Father Frost : Slavic (Russian)

UNIT IV: ASIAN FOLKLORE AND INDIAN FOLKLORE**Hours:12**

The Cobbler Astrologer : Arabic

The Two Jugglers : Chinese

Reflections : Japanese

Wealth or Wisdom : India

The Bird with Two Heads : India

UNIT V: OTHER ASPECTS IN FOLKLORE AND ORAL LITERATURE Hours:10

Songs and Narration expressed through Performance during festivals like New Year and harvest festivals

Proverbs or Maxims used

RECOMMENDED TEXTBOOKS:

1. Reddy, Chenna ed. *Folklore in the New Millenium* Delhi: Research India Press 2012
2. Baycroft, Timothy. *Folklore and Naturalism in Europe during the long 19thC* Brill Pub 2012

REFERENCE BOOKS:

1. Dundes, Alan. *Essays in Folklore : Theory and Method* Crea Pub: Chennai 1990
2. Vansina, Jan. *Oral Tradition as History* University of Wisconsin Press 2012
3. Kirmani, Mubina Hassanali *Oral Literature of the Asians in East Africa* East African Publishers 2002
4. Finnegan, Ruth H. *Oral Tradition and the Verbal Arts: A Guide to Research Practices* ASA Research Method Series Routledge 1992
5. Turin, Mark. Ed. *Oral Literature in the Digital Age: Archiving Orality and Connecting with Communities* World Oral Literature Series 2013

JOURNALS:

1. Indian Folklore Research Journal
2. jstor

E-LEARNING RESOURCES:

1. <https://www.scribd.com/document/356362707/Characteristics-of-Folklore>
2. <https://sacguide.libguides.com/c.php?g=272342&p=1817550>
3. https://www.worldoftales.com/European_folktales.html
4. <https://fairytalez.com/region/japanese/>
5. <https://eaff.eu/en/festivals/529-international-festival-of-folklore-songs-and-music>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	The student will be able to comprehend the different cultures of the world through the narrative mode.

CO 2	Will realise the significance of culture in every society
CO 3	Will understand that culture is part of the world literatures.
CO 4	Will recognise the values existing in different cultures of the world
CO 5	Will give a chance to analyse the creative aspect in story telling

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	2	3
CO2	2	3	2	3	2
CO3	3	2	3	2	3
CO4	2	3	2	3	2
CO5	3	2	3	2	3
AVERAGE	2.6	2.4	2.6	2.4	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1 NO CORELATION-0

I.M.A. SEMESTER – II

CULTURAL STUDIES (Major Elective III)

TOTAL HOURS: 4 (60 Hours)

COURSE CODE:

CREDITS: 3

COURSE OBJECTIVES:

1. To impart the socio-historic aspect of literature
2. To enable students to understand various cultures across the globe

3. To trace the culture from the medieval to the modern era
4. To recognise the existence of different cultures of the world
5. To understand the influence of Culture on the text created by the writer

COURSE OUTLINE

UNIT I : PROSE

Hours:15

Austin Warren	:	Literature and Society
Issac Sequiera	:	Popular Culture

UNIT II : POETRY

Hours:15

Rajakopalachary	:	From Ramayana (Indian)
Richard Wright	:	Hokku Poems
Japanese	:	Three Haiku
Omar Khayyam	:	Rubaiyat (Persian)

UNIT III : DRAMA

Hours:15

Moliere	:	The Hypochondria (French)
Mahashweta Devi	:	Rudali (Indian)

UNIT IV : FOLK

Hours:15

Elizabeth Gille	:	Alibaba & 40 Thieves (Middle East)
Chinnue Achebe	:	Why the Tortoise shell is not smooth (African)
John Mc Phee	:	The Lochness Monster (Scottish)
Mary White Bird	:	Ta-na-a-ke (Native American)

UNIT V: SHORT STORIES

Hours:15

Alfred Kazin	:	From A Walker in the City (The kitchen) (Jewish)
Eloise Engle	:	Terror in the North (Alaskan)

RECOMMENDED TEXTBOOKS:

Nayar, Pramod. K : *An Introduction in Cultural Studies*. Viva Books: New Delhi, 2016.

Rutherford Anna and Donald Hannab : *Commonwealth Short Stories*. Edward Arnold: UK, 1971.

BOOKS FOR REFERENCE:

- Milner, Andrew and Jelf Browitt : *Contemporary Cultural Theory: An Introduction*.
Routledge: UK, 2002.
- Gary Hall, Claire Birchell : *New Cultural Studies*. Orient Blackswan
India, 2009.
- Nayar, Pramod. K : *Contemporary Literary and Cultural Theory :
From Structuralism to Ecocriticism*. Person:
UK, 2009.

During, Simon. Ed. *The Cultural Studies Reader*. Taylor and Francis: USA, 2007.

Gupta, Nilanjana. Ed. *Cultural Studies*. Worldview Pub. UK, 2007.

Journals

1. International Journal of Cultural Studies. SAGE Journals Ed.
Jonathan Gray USA.
2. Journal of Commonwealth Literature. Vol 39. No.2, 2004.

E-learning Resources

1. <https://www.plu.edu/jensenmk>
2. <http://literarydevices.net/haiku>
3. <http://www.languageinindia.com>
4. www.readwritethink.org/resources
5. <http://pdfs.semantic scholr.org>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	To realise the significance of different cultures in the world
CO 2	To understand the linguistic codes based on culture
CO 3	To apply new interpretation of cultural folklore
CO 4	To appreciate world cultures in the context of universality

CO 5	To analyse cultural factors that produce such texts of creativity

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	2	3	3	3	2
CO3	3	2	2	2	3
CO4	3	2	3	3	3
CO5	2	3	2	3	2
AVERAGE	2.6	2.6	2.6	2.8	2.6

I.M.A. SEMESTER - II

THE ART OF WRITING SHORT STORY (Extra Disciplinary I)

TOTAL HOURS: 4 (60 Hours)

COURSE CODE: 175511

CREDITS: 3

COURSE OBJECTIVES:

1. To teach the fundamentals of good writing.
2. To expose the students to a variety of techniques to improve their writing process and gain new insights as a writer.
3. To make the students aware of the basic conventions of short fiction writing.
4. To guide the students to write better and more creatively.
5. To enhance students' employability by the application of their creative talents.

COURSE OUTCOME:

UNIT I:

Hours: 11

The Creative Writer

Characteristics of writers

Problems of writers

UNIT II:

Hours: 13

The Fiction Writer: The Novelist, The Short Story Writer, The Playwright & The Television and Film Writer

Material for Fiction: Perception and Remembrance & Choice of Subject

UNIT III:

Hours: 13

The Anatomy of a short story: Setting, Characters, Structure

Attributes: External Attributes, Internal Attributes, Environment

Methods of Characterization: Exposition, Dialogue, Inner Monologue, Narration

UNIT IV:

Hours: 13

Structure and Pattern: Point of View, Focus, Conflict, Theme, Time Span

Tone: Sound & Atmosphere

Style: Individuality & Respect for Language

UNIT V:

Hours: 10

Writing a Short Story for In-House Magazine

RECOMMENDED TEXTBOOKS:

Birkett, Julian. *Word Power: A Guide to Creative Writing*. London: A & C Black, 1995.

BOOKS FOR REFERENCE:

Arana, Marie. *The Writing Life: Writers On How They Think And Work Paperback*. Washington, D.C.: Washington Post, 2003.

Jones, Victor. *Creative Writing*. London: Hodder & Stoughton, 1976.

Knight, Damon. *Creating Short Fiction: The Classic Guide to Writing Short Fiction*. New York: St. Martin's Press, 1997.

Scott Bell, James. *Plot & Structure: Techniques and Exercises*. New York: YW Publications, 2004.

Siegler, Isabelle. *Creative Writing*. New York: Barnes and Noble Books, 1968.

JOURNALS:

Contemporary Literary Review India. Vol 4 No 2 May 2017.

The Little Magazine . Vol. VII, issue 3.

E-LEARNING RESOURCES:

<http://outofprintmagazine.co.in/submission-guidelines.html>

<https://www.christopherfielden.com/short-story-tips-and-writing-advice/short-story-magazines>

<https://creativewritingstudies.com/journal/>

<https://www.huffingtonpost.in/anubha-yadav/14-contemporary-short-stories-that-will-spark-yo>

<http://www.writerstreasure.com/creative-writing-101/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Appreciate literature as a creative art and the aesthetics of language.
CO 2	Display a working knowledge of the short story as a literary genre
CO 3	Identify and describe distinct literary characteristics of the short story form
CO 4	Analyse short stories for their structure and meaning, using correct terminology
CO 5	Write their own short stories with a broad perspective of universal human experiences

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	2	2	3

CO2	2	2	3	3	2
CO3	2	3	3	2	3
CO4	2	3	2	3	3
CO5	3	2	2	2	2
AVERAGE	2.2	2.4	2.4	2.4	2.6

SOFT SKILLS-II

LSRW SKILLS FOR EFFECTIVE COMMUNICATION

PURPOSE

To enhance holistic development of students and improve their employability skills

INSTRUCTIONAL OBJECTIVES

1. To develop inter personal skills and be an effective goal oriented team player
2. To develop professionals with idealistic, practical and moral values
3. To develop communication and problem solving skills

4. To re-engineer attitude and understand its influence on behavior

Unit I – INTERPERSONAL SKILLS

Meaning of interpersonal skills- List of interpersonal skills-Components of interpersonal skills-
Technique required improving interpersonal skills – Benefits of effective interpersonal skills.

Team work – Necessity of team work personally, socially and
educationally

Unit II – LEADERSHIP

Definition – list of leadership skills- Importance of leadership skills- Developing leadership skills- skills
for a good leader-Assessment of leadership skills – case study on leadership skills

Unit III – STRESS MANAGEMENT

Cause of stress and its impact- manage and distress, Circle of control,
Stress buster.

Emotional Intelligence: definition-Emotional quotient-why EI matters-Emotional scales-
Managing emotion.

Unit IV – CONFLICT MANAGEMENT

Introduction – Causes of conflict – Types of conflict – Conflicts in Human Relations – Reasons case
studies- Conflict management strategies- Approaches to conflict resolution

Unit V – DECISION MAKING AND PROBLEM SOLVING

Definition – Types of decision making –Steps of decision making-Factors affecting decision making-
Decision making process -six C's of decision making – Problem solving- Types of problem encountered
at work place – Approaches to problem solving- Characteristics of effective problem solving – problem
solving model and tool – Fishbone analysis-

TEXT BOOKS:

Soft skills, 2016, Career Development Centre, Green pearl
publication

REFERE NCE

1. Covey sean , Seven Habits of Highly Effective Teens, New York Fireside Publishers,1998
2. Carnegie Dale, How to win friends and Influence people ,New York : Simon & Schuster,1998
3. Thomas A Harris, I am ok you are ok , New York- Harper and Row,1972
4. Daniel Coleman, Emotional Intelligence, Bantam Book,2006
5. David J.Schwartz, The magic of thinking big, Simon & Schuster ,2014

SEMESTER III

II M.A. SEMESTER - III

Core Shakespeare

Core American Literature

Core Modernism – Post-Modernism

Core Literary Theory and Criticism - II

Major Elective IV Literature for Young Adults

Biography/Autobiography

Extra Disciplinary II Film and Literature

SEMESTER III

SHAKESPEARE

TOTAL HOURS: 5 [75 Hours]

COURSE CODE: 175512

CREDITS: 4

COURSE OBJECTIVES:

Explore and appreciate the Age of Shakespeare

2. Identify the different approaches to the study of Shakespeare

3. Be familiar with Shakespeare's language and its relevance to the contemporary world.

4. Understand the significance of Shakespeare

5. Comprehend the themes of Shakespeare's plays

1.

COURSE OUTLINE:

UNIT I: TRAGEDY

17 Hours

Timon of Athens

UNIT II: COMEDY

15 Hours

Merry Wives of Windsor

UNIT III: HISTORICAL

15 Hours

King John

UNIT IV: SONNETS

12 Hours

Sonnets – 22, 43, 123, 137, 144, 153

UNIT V:

16 Hours

Shakespearean Audience

Importance of Opening Scene

Shakespearean Clowns

Supernatural Element

Asides & Soliloquies

Mythical & Archetypal Study of Shakespeare's Plays

RECOMMENDED TEXTBOOKS

1.Evans Blakemore , *The Sonnets*, Oup New Delhi 2007.

2.Iyengar Srinivasa K.R, *Shakespeare His World & His Art*, Jupiter Press, Bombay 1964.

REFERENCE BOOKS:

1. Bradby Anne, *Shakespeare Criticism*, Rashtriya Printers , Delhi 2004
2. Shaw Jonathan .S, *History Place Of Shakespeare . A Revaluation* , Atlanta Pub. Ltd.,New Delhi ,2010 .
3. Bradley A.C, *Shakespearean Tragedy*, Aijbus , Delhi 2006
4. Muir Kenneth , *Shakespeare-Contrasts And Controversies*, Harvester Press, Great Britain, 1985.
5. Kott Jan , *Shakespeare,Our Contemporary* Methuen& Co. Ltd.,Great Britain, Rept. 1983.

JOURNALS:

1.Shakespeare Quarterly. (1950-2013)(Voli-Noi , Vol64- No4)Issn: 00373222, Eissn: 15383555.

2. Making Sense Of Shakespeare: A Cultural Icon For Contemporary Audience –Core , Cosmopolitan Civil Societies Journal (Vol5-No3,2013)

Issn: 1837-5391.

E-LEARNING RESOURCES:

1.<https://shakespearedocumented.folger.edu/>

2.<https://morningside.libguides.com/shakespeare>

3.<https://libguides.reading.ac.uk/english-literature/shakespeare-on-film>

4.<https://rehnatheatre.com>production>.

5.<https://www.design mynights.com>s>.

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Comprehend the concepts of Drama and Theatre and their relevance to life
CO 2	Brief the biography of Shakespeare
CO 3	Understand the impact of Shakespeare on Literature
CO 4	Understand the impact of Shakespeare on Literature
CO 5	Analyse the timeless themes of Shakespeare's plays

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	3	3
CO2	2	3	3	2	3
CO3	3	2	2	2	2

CO4	3	3	3	3	2
CO5	1	1	1	2	2
AVERAGE	2.4	2.2	2.2	2.4	2.4

SEMESTER III

AMERICAN LITERATURE

TOTAL HOURS: 5 [75 Hours]

COURSE CODE:175513

CREDITS: 4

COURSE OBJECTIVES:

1. Help students to participate and critically analyse the melting pot of cultures and to expose them to American English.
2. Demonstrate familiarity with the social and political forces shaping American culture.
- 3 .Expose students to the literature of the Colonial Times, the Civil War, the 1920,
the Great Depression and representative authors and works.
4. Comprehend the impact of American culture in global literature.
5. Learn the socio and historical significance of American literature.

COURSE OUTLINE:

UNIT I: INTRODUCTION

15 Hours

Walter Blair et al	:	Historical inter chapter - from <i>Literature of the United States</i>
Malcolm Bradbury & Howard Temperley	:	War and cold war – from <i>Introduction to American Studies</i>

UNIT II: PROSE / AUTOBIOGRAPHY

15 Hours

Mark Twain	:	How to Tell a Story
Prof Irving Babbitt	:	The Critic and the American Life
Langston Hughes	:	Theme for English B

UNIT III: POETRY**15 Hours**

Robert Lowell	:	Skunk Hour	
Casey Jones	:	Railroad Oral Song	
R. Frost	:	Once by the Pacific	
Richard Eberhart	:	On a Squirrel, Crossing the Road in Autumn, In New England	
Edna St. Vincent Millay	:	An Ancient Gesture	
Countee Cullen	:	Yet Do I Marvel	
Walt Whitman	:	There was a Child	
E.E.Cummings	:	Old Age Sticks	

UNIT IV: DRAMA**14 Hours**

Edward Albee	:	The American Dream
Tennessee Williams	:	A Streetcar Named Desire

UNIT V: FICTION**16 Hours**

J.D. Salinger	:	Catcher in the Rye

SHORT STORIES

Edgar Allan Poe	:	Murders in the Rue Morgue
John Updike	:	Brother Grasshopper
Thornton Wilder	:	The Bridge on San Luis Rey
Reynolds Price	:	The Knowledge of My Mother's Coming Death

RECOMMENDED TEXTBOOKS:

1. Bradbury Malcolm & Howard Temperley, *Introduction To American Studies*, Longman Inc, Newyork, 1981.

2. Blair Walter , Theodore Hornberger, Randall Stewart, James Miller Jr., *An Anthology & History From Civil War To The Present*, Atlanta: Heritage Printing Scott Foreman & Co, 1970.

REFERENCE

1. Littel Dougal M.C . , *The Language Of Literature*, Dallas; Houghton Mifflin Co.1977
2. Winston, Rinehart & Holt, *Elements Of Literature*, New York; Austin, 2000.
3. Safer Fannie ,Daniel Kathleen T. *Adventures In Appreciation*. Orlando Florido: Harcourt Brace Favonovich, 1980.
4. Schorer Mark, Arno Javett, Walter Havinghurst, Allen Kirschner, *American Literature*, Boston: Houghton Mifflin Co., 1965
5. Blair Walter Et Al , *Literature Of The United States*, Vol. li 3rd Ed.(Do.346), Foresman And Company Atlanta, 1970. (Pg.2-9, Pg.12-14, Pg.16-21)

JOURNALS:

1. Bergner Gwen, “The Plantation, the Post Plantation and After Lives of Slavery”, 1 September 2019, Issue:3.
2. *The Cambridge Quarterly the American Historical Review* , The United Kingdom , Oxford University Press.

E-LEARNING RESOURCES:

1. www.en.utexas.edu/amlit/links
2. <https://libguides.southernct.edu/c.p..>
3. <https://www.nypl.org/node>
4. <http://haywood.libguides.com/c.p..>
5. <https://libguides.bc.edu/earluy-a...>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Learn the socio, historical background of America as Global Power
CO 2	Introduce the glossary of literary terms
CO 3	Inquire into Transcendentalism and its impact
CO 4	Develop cultural awareness
CO 5	Improve critical thinking through interpretation and comparative analysis

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	2	2	3
CO2	3	3	2	2	3
CO3	2	2	3	2	2
CO4	2	2	2	3	2
CO5	3	3	2	2	3

AVERAGE	2.4	2.4	2..2	2.2	2.6

MODERNISM AND POST MODERNISM

TOTAL HOURS: 5 [75 Hours]

COURSE CODE: 175514

CREDITS: 4

COURSE OBJECTIVES:

- 1.Expose students to the current theories and terms of literature.
- 2.Develop a modern belief in an orderly Newtonian Universe of the certitude of Cartesian philosophy.
3. Learn the concepts and terms related to the age
- 4.Understand the relationship between the two movements
5. Introduce various critics and their critique

COURSE OUTLINE:

UNIT I: INTRODUCTION

15 Hours

- Terry Eagleton : Capitalism, Modernism &
Post Modernism
- E.D. Hirsch : Faulty Perspectives

UNIT II: PROSE

13 Hours

- Aldous Huxley : Wordsworth in the Tropics
- Martin Esslin : Significance of the Absurd
- Northrop Frye : The Drunken Boat: The
Revolutionary Element in
Romanticism

UNIT III: POETRY

15 Hours

- Wilfred Owen : A Strange Meeting

W.B. Yeats	:	The Second Coming
T.S. Eliot	:	The Wasteland (Part 1)
Thomas Gunn	:	On the Move
Beatles	:	Lucy in the Sky with Diamonds
Dylan Thomas	:	And Death Shall Have No Dominion
R.S. Thomas	:	In Church

UNIT IV:

15 Hours

DRAMA

Peter Schaffer	:	Amadeus (Mozart)

SHORT FICTION

Franz Kafka	:	Prometheus

UNIT V: KEY TERMS AND CONCEPTS

15 Hours

Hegemony

Hybridity

Rastafarianism

Psycho – Analysis

Fanonism

Absurd

Baroque

Existentialism

Modernism

Myth

Grotesque

RECOMMENDED TEXTBOOKS:

1. Lodge David , 2nd Edition *Modern Criticism Theory*
2. Nayar Pramod K. , *Literary Theory* , New Delhi ; Asia Club 2002.

REFERENCE:

1. Oxford Anthology Of English Literature Vol. II (Ref. 4b).
2. Esslin Martin , *The Theatre Of The Absurd*, 3rd Edt. London: Methuen , 2001.
3. Fowler Roger, *A Dictionary Of Modern Critical Terms* , London: Routledge & Kegan Paul , 1973.
4. Sethuraman V.S., *Contemporary Criticism :An Anthology* , London : Macmillan ,1978.
5. Ward Glenn ,*Post Modernism* , Hodder Headline Ltd., London, 1997.

JOURNALS:

1. Common Themes & Techniques Of Postmodern Literature Of Shakespeare- Ramen Sharma & Dr. Preeti Chawdhary International Journal Of Educational Planning & Administration. ISSN 2249-3093 Vol. 1, No. 2 (2011), Pp. 189-198, C Research Indian Publications.
2. The Meaning And Meaninglessness Of Postmodernism: Some Ironic Remarks By Mats Alversson First Published Nov 1, 1995/Research Article.

E-LEARNING RESOURCES:

1. <http://www.ripublication.com/ijepa.htm>.
2. www.sciencedirect.com.
3. <https://doi.org/10.1177/0170840690501600606>.
4. <https://www.webpages.uiuaho.edu/eng/258/lecture>.
5. <https://www.online.info/kaf>.

COURSE OUTCOMES:

CO Number	CO STATEMENT

CO 1	Examine the issues related to international dimensions of Modernism – Post Modernism
CO 2	Comprehend the concepts, terms and critiques related to their Ages
CO 3	Expose to various critics
CO 4	Trace the development of individual and social identities
CO 5	Analyse the relationship between the two movements from a critical perspective

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	3	2
CO2	3	2	2	3	2
CO3	2	2	3	2	2
CO4	2	3	2	2	3
CO5	2	2	2	2	2
AVERAGE	2.4	2.2	2.2	2.4	2.2

SEMESTER III

LITERARY THEORY AND CRITICISM -II

TOTAL HOURS: 5 [75 Hours]

COURSE CODE: 175515

CREDITS: 4

COURSE OBJECTIVES:

1. Help students know the various literary movements and their association with art and to expose them to literary theories of 20th century stalwarts such as Eliot, I.A.Richards & Brooks etc.
- 2.Explore masterpieces of criticism
- 3.Appreciate Indian poetics and dramatics
- 4.Expose to the various literary movements in Europe.
5. Introduce the relationship between fine arts and literature from the beginning of 20th century.

COURSE OUTLINE:

UNIT I: INTRODUCTION

15 Hours

Schools of Literary Theory - from Ram Yattan Yadav's *New Literature in English*

ART & LITERATURE MOVEMENTS

1880's	-	Symbolist Movement
1910	-	Expressionism
1912	-	Vorticism – Ezra Pound & Eliot
1913	-	Imagism / Impressionism
1917	-	Surrealism (Abstract Art)
1920's & 30's	-	Futurism

- from P.K. Ravi's *Modernism & Post Modernism in English Literature*

UNIT II: APPROACHES TO CRITICISM

15 Hours

1920's	-	Marxist
1941	-	New Criticism
1950's	-	Modernism
1960's	-	Post-Modernism
1960's – 70's	-	Structuralism
1970's – 80's	-	New Historicism

a. from V.S. Sethuraman's Introduction to *Contemporary Criticism and an Anthology*.

UNIT III: ESSAYS PART I

15 Hours

T.S. Eliot	:	Religion & Literature
I.A. Richards	:	Practical Criticism – Poem VII
Cleanth Brooks	:	The Language of Paradox
M.H. Abrams	:	The Deconstructive Angel

UNIT IV: ESSAYS PART II

15 Hours

Stephen Greenblatt	:	The Circulation of Social Energy
Wolfgang Iser Approach	:	The Reading Process: A Phenomenological

UNIT V: ASSOCIATIVE CONCEPTS & TERMS IN

LITERARY CRITICISM

15 Hours

Abrogation
Contrapuntal Reading
Filiation / Affiliation
Objective Co-relative
Deconstruction
Formalism
Dissociation of Sensibility
Hermeneutics
Stream of Consciousness
Poetics
Pastiche

RECOMMENDED TEXTBOOKS:

1. Sethuraman V.S *Contemporary Criticism : An Anthology*, London:Macmillan ,1978.
2. Ravi.P.K ,*Modernism And Post Modernism* , Navyug Bks, International , Delhi,2013 .

REFERENCE:

1. Lodge David, 2nd Edition, 20th Century *Literary Criticism* London: Longman ,1972.
- 2.Oxford *Anthology Of English Literature* Vol li(Ref. 4b).
3. Fowler Roger, *A Dictionary Of Modern Critical Terms* London: Routledge ,& Kegan Paul,1973.
4. Richards I.A , *Pratical Criticism* , London : Routledge & Kegan Paul, 1929.
5. Ashcroft Bill, Gareth Griffiths , Helen Tiffin , *The Empire Writes Back , Theory & Practice In Post Colonial Literatures*, Routledge, New Yourk,2002.

JOURNALS:

1. Tess Mc Nulty."Joyce Adapting Shelly: The Social Function Of Lyric From."Journal Of Modern Literature, Vol.41,No.2,2018, Pp. 23-41.
2. Eggan, Taylor A. "Revolutionary Temporality And Modernist Politics Of Form: Reading Ngugi Wa Thiong'o Reading Joseph Conrad."Journal Of Modern Literature, Vol38,No.3,2015, Pp.38-55.

E-LEARNING RESOURCES:

1. <https://www.newyorker.com>>p.
2. <https://www.English.cam.ac.uk>>pr..
3. <https://link.springer.com/chapter>.
4. <https://www.britannica.com>>m-h-..
5. <https://www.amazon.in>>practical-c...

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Expose to the various literary movements in Expose to the various literary movements in Europe
CO 2	Introduce the relationship between fine arts and literature
CO 3	Comprehend Literature as a body of knowledge open to multiple interpretations
CO 4	Become familiar with major schools of thought and their relevance in everyday life
CO 5	Experience Literature as a potential tool for social and political changes

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	2	2	2	2	2
CO3	2	3	3	2	2
CO4	3	3	2	3	3
CO5	2	2	2	3	3
AVERAGE	2.4	2.4	2.4	2.6	2.6

SEMESTER III

LITERATURE FOR YOUNG ADULTS

[Major Elective IV]

TOTAL HOURS: 4 [60 Hours]
CREDITS: 3

COURSE CODE: 175516

COURSE OBJECTIVES:

1. Help students of literature to partake in a Child's world of Story and Fairytale.
2. Identify the major writers, works and periods of children's literature. Historic development of literature for children.
3. Demonstrate the historical background. To identify the value of literature for young people through the eyes of the child.
4. Make an analytic and interpretative research.
5. Train in creative writing

COURSE OUTLINE:

UNIT I: INTRODUCTION

12 Hours

Peter Hunt	:	Introduction to Children's Literature
Philip Pullman	:	Introduction – from <i>Grimm's Tales for Young and Old</i>

UNIT II: POETRY

12 Hours

African Oral poetry	:	The Baboon
Thomas Sterns Eliot	:	A Dog is a Dog
Sarojini Naidu	:	Coromandal Fishes

Mary Howitt	:	The Spider & The Fly
H.W. Long Fellow	:	Children
Victor Hugo	:	A Sunset
Alfred Joyce Kilmer	:	Trees
Roald Dahl	:	The Dentist & The Crocodile

UNIT II: GRAPHICS/COMICS

12 Hours

Edgar Rice Burrough's	:	Tarzan of the Apes
Adventures of Tintin	:	Red Rackham's Treasure

UNIT III: FABLES & FAIRY TALES

12 Hours

Nathaniel Hawthorne	:	The Gorgon's Head
Enid Blyton	:	The Wonderful Tar-Baby
Panchatantra	:	The Jackal who killed No Elephants
Grimm	:	Hansel & Gretel
La Fontaine	:	The Ant and the Grasshopper
Jean de Aesop Fables	:	The Bird in Borrowed Feathers

UNIT V:

12 Hours

FICTION

Rudyard Kipling	:	The Jungle Book

SHORT STORIES

Seema Chatterjee	:	Queen of Hearts
Frank Baum	:	Wizard of Oz -1 st & 2 nd Chapter

RECOMMENDED TEXTBOOKS:

1. Hahn Daniel , *Oxford Companion To Children's Literature* , Oup:London ,2017.
2. Hunt Peter .R ,*Understanding Children's Literature*,2nd Edition Routledge, New York,2005

REFERENCE :

1. Parasuraman Sunita , *Panchatantra*, Delhi : Jaico Publishing House,2013.
2. Blyton Enid, *The Brer Rabbit Collection* , Uk; Egmount, 1965.

3. Philip Pulman, *Grimm's Tales For Young And Old*, New York: Penguin, 2012.
4. Burroughs Edgar Rice, Tarzan, *Lord Of The Jungle*, Marvel Comics, Usa, June, 1977.
5. Hergé, *Adventures Of Tintin, "Le Petit Vingtime" Casterman*, Dupuis, Le Lombard: Belgium, 1929

JOURNALS:

1. The Research Connection-Jeffrey S-Kaplan Young Adult Literature In The 21st Century .Moving Beyond Traditional Constraints. The Allan Review –Winter 2005.
2. Children's Literature Association Quarterly, John Hopkins Univ. Press. 1997.

E-LEARNING RESOURCES:

1. fairytalesoftheworld.com>all-stories.
2. <https://germanstories.vcc.edu>>grimm
3. www.rudyardlake.com>rudyardkipling.
4. <https://in.linkedin.com>>peter>hunt
5. pullmankualalumpur.com>link-d.

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Give a taste of the child's world and fairy tales
CO 2	Identify the salient features of Literary Texts
CO 3	Employ knowledge of literary traditions to produce imaginative writing
CO 4	Hone their skills in analysis, interpretations and research
CO 5	Train towards creative writing

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	2	3	2	3
CO3	2	2	2	2	2
CO4	3	3	2	3	3
CO5	1	1	1	1	1
AVERAGE	2.4	2.2	2.2	2.2	2.4

SEMESTER III

BIOGRAPHY AND AUTOBIOGRAPHY

TOTAL HOURS: 4

COURSE CODE:

CREDITS: 3

COURSE OBJECTIVES:

1. Identify the genres of biography, autobiography and sub-genres.
2. Read in-depth and critically evaluate the genre.
3. Appreciate the contemporary relevance.
4. Identify the literary elements
5. Understand the life of distinct personalities

COURSE OUTLINE:**UNIT I : THEORY****12****Hours**

Linda Anderson	:	Autobiography – Law of Genre & Freud's
		Unconscious
Shelston	:	Biography – Truth of fact & Truth of Fiction

UNIT II: AUTOBIOGRAPHY**12 Hours****POETRY**

Sylvia Plath	:	Mirror
Paul Laurence Dunbar	:	Sympathy
Frank O'Hara	:	Autobiographia Literaria
Nissim Ezekiel	:	Background, Casually

PROSE

Maya Angelou	:	When I Lay My Burden Down
C.Rajagopalachari	:	Some Personal Reminiscences

UNIT III: BIOGRAPHY**12 Hours**

Lytton Strachey's : Excerpts from Queen

E.A. Poe : Final Days

Frances Wilkins : The Prince of Biographers: How Boswell met Johnson

UNIT IV: MEMOIR/ DIARY WRITING

12

Hours

Mukhtar Mai : In the Name of Honour

Zlata Filipovic : Zlata's Diary

UNIT V: TRAVELOGUE

12 Hours

Alexander Frater : Chasing the Monsoon

RECOMMENDED TEXTBOOKS:

1. Anderson Linda , *Autobiography*(The New Critical Idiom),Routledge ,London , 2001
2. Shelston Alan , *Biography*(The New Critical Idiom), Routledge, London ,2001

REFERENCE

1. Poe Edgar Allan , *Mournful And Never Endinmg Rememberance*,
2. Angelou Maya, *Fro M I Know Why The Caged Bird Sings*", Random House ,New Yourk 1988
- 3.Gandhi M.K ,*The Story Of My Experiments With Truth*, Dover Publication, U.S, 1993
4. Filipovic Zalata, *Zalata 'S Diary : A Child's Life In Wartime Sarajevo*, Penguin , London, 2006
- 5.Silverman Kenneth , *Edgar Allan Poe, Mournful& Never Ending Rememberance* , Harper Collins, New York , 2008.

JOURNALS:

1. Contemporary Literary Criticism By Carolyn Riley, Publisher: Detroit, Gale, Cengage Learning.
2. Journal Of Modern Literature, Publisher Bloomington, In: Indiana University Press, 2001.

E-LEARNING RESOURCES:

1. <https://www.authorlearningcenter.com>>
2. <https://www.biography.com>>h
3. <https://www.theparisreview.org>>he
4. <https://m.thechronicle.com.au>>topic
5. <https://www.history.com>>topics.

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Recognise the structure of biography and autobiography as distinct forms of literature
CO 2	To connect biographical and autobiographical text to their historical and cultural contexts
CO 3	Identify the literary elements related to biographical and autobiographical writings
CO 4	Compare and contrast autobiographical with biographical writings
CO 5	To analyse and comprehend the treatment of a perceiving and living individual

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5

CO1	2	3	2	3	3
CO2	3	2	3	2	2
CO3	2	2	2	2	3
CO4	2	2	2	2	2
CO5	3	3	3	3	3
AVERAGE	2.4	2.4	2.4	2.4	2.6

SEMESTER III

FILM AND LITERATURE

[Extra Disciplinary II]

TOTAL HOURS: 4 [60 Hours]

COURSE CODE: 157717

CREDITS: 3

COURSE OBJECTIVES:

- 1.Expose the students to the various genres in English films and to kindle their interest to
- 2.Cultivate the habit of watching English movies to improve their spoken and listening skills.
3. Understand the functions of films as an institution for production and distribution of social knowledge and entertainment and to expose the students to a variety of film styles.
- 4.Expose the students to English language .
- 5.Develop the listening, speaking, and writing skills.

COURSE OUTLINE:**UNIT I: INTRODUCTIUON****12 Hours**

Introducing Film Studies

What is Cinema?

History of Cinema

Film Genres (Film Novice, Horror, Avant-garde/Experimental, Documentary)

Cinema & Society

Hollywood Cinema and Early Cinema

Rise & Decline of the Studio, British Cinema, Films, Culture Ideology, The studio system

UNIT II: RUDIMENTS OF FILM-MAKING (with specific reference to Regional Cinema)**12 Hours**

Screenplay

Techniques

Costumes

Adaptations – from Novel, Stage, Theatre

UNIT III: HOLLYWOOD – GENRES**12 Hours**

Thriller	:	Hitchcock's 'Rear Window'
Western	:	The Good, the Bad and The ugly
Gangster	:	The God Father

War	:	The Bridge on the River Kwai (W.W. II), The Odessa File (Holocaust)
Historical	:	Ben Hur (Rome)
Science-Fiction	:	Star Wars
Horror	:	Jaws

UNIT IV: HOLLYWOOD- GENRES

12 Hours

Animation	:	Lion King
Fantasy	:	Chronicles of Narnia
Musical	:	The Sound of Music
Comedy	:	Charlie Chaplin's 'The Kid', Jackie Chan's Rush Hour1
Biopic	:	Richard Attenborough's 'Gandhi'

UNIT V:

12 Hours

Case Study : The Western
Writing a Film Review on one of the above films

RECOMMENDED TEXTBOOKS:

- 1.Chanan Michael. *The Technique Of Flim Editing*,Karel Reisz And Gavin Millar, Focal Press, 1953
- 2.Thomson David , *A Biographical Dictionary Of Film* , 1975.

REFERENCE

- 1.Bandi Raghu Ram, *Novels Into Films*,New Delhi:Prestige International Book House,2009
- 2.Babu N.M ,*Introducing Films Studies* ,Reejathankachan Et Al ,Main Spring,2016
- 3.Dick Bernard .F,*Anatomy Of Film* 6th Ed,St.Martin's, New York.(Pg 270-319.,37-51)
- 4.Neumeyer David, *The Oxford Handbook Of Film Music Studies*, Publication Date,10.12.2013,.
- 5.Silver Alain, *A Film Noir Encyclopedia* ,Publication Date,13.5.2010.

JOURNALS:

- 1.Literature /Flim Quarterly Vol,6 ,No.2(Spring 19780,PP.135-143
- 2.Literature And Film “ Eltjournal, Vol,45,Issue To ,April1991,Pg147-155.

E-LEARNING RESOURCES:

1. www.bpnice.com
2. <https://www.filmiscte.org>>genres
3. <https://www.amazon.com>>Hollywood
4. <https://www.investopedia.com>>movie.
5. <https://www.theatlantic.com>>Hollywood.

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Identify the structures and techniques used in various forms of film and literature
CO 2	Understand the dependence of film on literature
CO 3	Expose to various genres in English films
CO 4	Feel the influence of film in real life
CO 5	Develop the skills of listening and speaking

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	2	2	2
CO2	2	2	2	2	2

CO3	3	3	3	3	2
CO4	3	3	3	3	2
CO5	3	3	3	3	3
AVERAGE	2.6	2.6	2.6	2.6	2.2

SOFT SKILLS – III

LIFE SCOPING SKILLS FOR SUCCESS

PURPOSE To enhance holistic development of students and improve their employability skills

INSTRUCTIONAL OBJECTIVES

1. To develop inter personal skills and be an effective goal oriented team player
2. To develop professionals with idealistic, practical and moral values
3. To develop communication and problem solving skills
4. To re-engineer attitude and understand its influence on behavior

UNIT I – COMMUNICAITON SKILLS

Purpose of communication – process of communication-importance of communication in business-Difference between technical and general communication-Barriers to communication – Types of communication- advantages of communication –Reading, Listening skills – Language for communication-Communication in organization-communication network – writing business letter – Report writing – Writing Email – Oral, aural communication – Employment communication (Resume, Job interview)

UNIT II – NEGOTIATION SKILLS

Introduction – Features of negotiation – Types of negotiation – Negotiation Process- Six stages of negotiation – Factors affecting negotiation –Benefit of effective negotiation – Negotiation strategy - Bargaining Zone Model of Negotiation – BATNA and its importance – Negotiating behavior – Third party negotiations – Effective negotiation – Steps involved in formal negotiation

UNIT III – PRESENTAION SKILLS

Preparation of presentation– Slide presentation –Principles and techniques of presentation – Business presentation specification – Report writing – Developing effective presentation skills– Oral presentation – Slide presentation – Verbal and Non-verbal communication during presentation- Attracting audience, ice breaking, get them into mood, visualization tools – appreciation and critique – Defense against manipulation.

UNIT IV – PUBLIC SPEAKING

Introduction -Rhetorical Situation –Practicing delivery- Characteristics of effective communication – Knowing your audience – Choosing the topic and structure of speech – Persuasive and motivational

speech principles – Developing style – Outlining and organizing speech – Supporting ideas – Organizing arguments – dealing with audience questions.

UNIT V – PERSONALITY ENRICHMENT

Introduction – Personality development – Importance of personality development – Personality development Tips – Different types of personality -Freud's Psychoanalytic Theory – Personality Traits – Personality Disorder – Dressing and personality development

BOOKS TO REFER

A Workbook to Develop Skills for Employment by Frederick H. Wentz

A Soft Skills Training Workbook by Frederick H Wentz

Interpersonal skills for entrepreneur by mellisa conteras

SEMESTER IV

II M.A. SEMESTER – IV

Core	New Literature
Core	English Language Teaching
Core	Project

Core

Marginal Literature

Major Elective V

World Classics in Translation

An Approach to SET/NET

II.M.A. SEMESTER – IV

NEW LITERATURE

TOTAL HOURS: 6 [90 Hours]

COURSE CODE: 175518

CREDITS: 4

COURSE OBJECTIVES:

1. Review various theoretical approaches to New Literature
2. Learn various terminologies related to New Literature
3. Read critically the wide range of literary works from recent independent countries.
4. Think and discuss critically on a wide range of authors.
5. Encourage comparative analysis of text.

COURSE OUTLINE:

UNIT I: INTRODUCTION

Hours: 18

Colonialism, Post Colonialism - from Pramod K Nayar's *Postcolonial Literature: An Introduction*

ASSOCIATED CONCEPTS AND TERMS:

Globalization

Imperialism

Binarism

Place

Hegemony

UNIT II: POETRY

Hours: 18

Aurobindo : The Pilgrim of the Night

Judith Wright : Clock and Heart

Caughnawaga	:	Indian Reservation
Chand A Sirimane	:	The Uncrossed Bridge
F.R. Scott	:	Laurentian Shield
Anon	:	The Wild Colonial Boy
Margaret Atwood	:	Journey to the Interior
James Mc Auley	:	The True Discovery of Australia

UNIT III: PROSE

Hours: 18

M.N. Wankhade	:	Friends the Day of Irresponsible Writers is Over

UNIT IV: DRAMA

Hours: 18

Nyugi Wa Thang'O and		
Ngugi LWa Mirri	:	I will Marry When I want
Ray Lawler	:	Summer of the Seventeenth Doll

UNIT V:

Hours: 18

FICTION

Patrick White	:	Tree of Man

SHORT STORIES

Katharine Mansfield	:	A Cup of Tea
Paule Marshall	:	To-Da-Duh- in memorium

RECOMMENDED TEXTBOOKS:

1. Okpewho Isidore , *The Heritage Of African Poetry :An Anthology Of Oral &Written Poetry* ,Hong Kong;Longmans
2. Kermode Frank ,John Hollander,Et .Al. *Oxford Anthology Of English Literture*,Vol.II Oup,1973

REFERENCE:

1. Yadav Ram Yattan,*New Literature In English* ,New Delhi,Magnate Books,2015

2. Ashcroft Bill ,Gareth Griffiths, Helen Tiffin ,*Key Concepts On Post Colonial Studies*,London,Routledge ,New York, 1998
3. Harrex Syd , Maya Adelaide – *Diaspora –The Australian Experience* Ch 41 ,2004
4. Hall Gary &Clare Birchall ,*New Cultural Studies ,Adventures In Theory*, Orient Blackswan Hydrabad,2009
5. Nanden Cynthia & Driesen Ralph Crane ,*Diaspora :The Australian Experience*: Prestige International Pub. House ,New Delhi ,

JOURNAL:

1. Sage Journal –Literature&History,3rd Series,Vol-28, No-2,Nov-2019.
- 2.Sahithya Akademik,National Academy Of Letters,Bhawan Rabindra,New Delhi.

E-LEARNING RESOURCES:

- 1.<https://www.linkedin.com>patwhite>
- 2.www.academypublication.com>..
- 3.<https://www.bbc.com>news>marg..>
- 4.<https://literariness.org>hegemo,>
- 5.<https://ngugiwathiongo.com>books>

COURSE OUTCOMES:

CO Number	CO STATEMENT

CO 1	Expose to writings pertaining to modern literature of various countries
CO 2	Get a glimpse of the intrinsic and artistic values of modern literature
CO 3	Foreground transnational and transcultural exchange processes and developments
CO 4	Encourage comparative analyses of texts from a broad variety of national and cultural contexts
CO 5	Instil the requisite critical insight and facilitate to decide the area of research

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	3	2
CO2	2	3	2	3	3
CO3	3	3	2	3	3
CO4	3	2	3	2	2
CO5	3	2	3	3	2
AVERAGE	2.8	2.4	3	2.8	2.4

II.M.A. SEMESTER - IV

ENGLISH LANGUAGE TEACHING

TOTAL HOURS:6 HRS

COURSE CODE:175519

CREDITS:4

OBJECTIVES

- 1.To overview of theories of English Language teaching & curriculum design
- 2.To explore various approaches & methods to language acquisition
- 3.To acquire various skills
- 4.To introduce students to ESP
- 5.To help learn the importance of evaluation & lesson plan

COURSE OUTLINE:

Unit I: THEORY OF LANGUAGE LEARNING

Hours :18

Concept, Nature & Purpose of Curriculum Design

Unit II: METHODS

Hours :18

Krashen's Monitor Model
Terrell's Natural
Counselling Learning
Silent Way
Notional & Functional Approach
Community Language Learning
Suggestopedia

Unit III: THEORIES

Hours :18

Gestalt theory
Gagne's Learning hierarchies

Unit IV: APPROACHES TO ESP

Hours :18

EOP, EAP, EST
Development
Factors influencing ESP Teaching and Learning
Problems & Demands on the Teacher

Unit V: EVALUATION & DRAFTING A LESSON PLAN

Hours :18

Types Aims & Purposes of Tests
Lesson Plan How to Teach Grammar
Language Games.
Learning English through songs

RECOMMENDED TEXTBOOKS:

1. Yule George , *The Study Of Language*, Cambridge, U K : Cambridge University Press , Chicago Apa
6th Edition 2006,

2. Prabhu N.S , *Second Language Pedagogy* , Oxford University Press 1987

REFERENCE :

1. Evans David, *Language Identity And Symbolic Culture.*, Liverpool Hope University; U.K,2018.
2. Krishnaswamy .N, Lalitha Krishnaswamy ,*Teaching English Approaches, Methods & Techniques* , Macmillan, 2009.
3. Kennedy Chris & Rod Bolitho , *English For Specific Purpose* , London :Macmillan ,1984
4. Pfrehm James , *Technolinguism , One Mind And The Machine* ,Ithaca College , U.S.A 2018
5. Jack C. Richards & Theodore Rodgers , *Approaches & Methods And Language Teaching:A Description & Analysis*, Cambridge : C U P, 1986.

JOURNALS:

1. International Journal Of English Language And Linguistics Research(Ijellr) Ed.,Dr. Zhang Qian,U.K.
2. Eltjournal,Ed. Cogo Alessia,Vol,73.Issue-3,July 2019..

E-LEARNING RESOURCES:

1. <https://www.persee.fr/doc/apliu..>
2. <https://www.teachingenglish.org.uk>..>
3. <https://www.teachthought.com>50-..>
4. <https://www.fluenta.com>blog>th...>
5. www.ncert.nic.in>links>pdf

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Analyse the concepts, features, structure and the mechanism of English Language Learning and Teaching

CO 2	Develop personal and professional abilities
CO 3	Develop new materials to be used in Teaching English
CO 4	Acquire linguistic competence
CO 5	Communicate in English in a way close to the level of native language

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	3	2	2
CO2	3	2	2	3	2
CO3	3	3	2	2	2
CO4	2	3	2	3	2
CO5	3	2	2	2	3
AVERAGE	2.6	2.4	2.2	2.4	2.2

II.M.A. SEMESTER - IV

PROJECT

TOTAL HOURS: 6 (90 Hours)

COURSE CODE:175520

CREDITS: 4

COURSE OBJECTIVES:

1. Decide the area of research.
2. Learn to obtain the necessary resources.
3. Review the techniques of research writing
4. Identify methods of documentation & citation
5. Acquire skills to write a critical review

COURSE OUTLINE:

UNIT I:	Identifying a research subject	Hours: 12
UNIT II:	The Mechanics of writing	Hours: 12
UNIT III:	Format of the Research Paper	Hours: 12
UNIT IV:	Documentation	Hours: 12
UNIT V:	Project	Hours: 12

RECOMMENDED TEXTBOOKS:

1. Mishra Bhushan Shanti , Shashi Alok, Handbook Of Research Methodology : A Compendium For Scholars & Researchers, Edu Creation Publishing , New Delhi, 2017.
2. Varghese John, N Krishnaswamy, And Sunita Mishra, Contemporary Literary Theory: A Students Companion., 2000.

REFERENCE:

1. Gibaldi Joseph, Mla Handbook For Writers Of Research Paper, U.S 2018.
2. Achtert S. Walter&Thorpe , Aims & Methods Of Scholarship Modern Language Association Of America, Us, 1963.
3. Raju A.K. , Abc Of Literature
4. Strunk William , Elements Of Style Allyn & Bacon (1999) New York.
- 5.Strathausen Carsten,Contemporary Critical Approaches: Contemporary Literary Theory,2018.

JOURNALS:

- 1.Contemporary Literature ,University Of Wisconsin Press, Vol-25,2004.
- 2.Contemporary Literary Criticism , Detroit ,Gale,Cengage Learning.

E-LEARNING RESOURCES:

- 1.<http://dissertationauthors.com>>blog
- 2.<https://www.prospects.ac.uk>>how-t...
- 3.<https://onlinephdprogram.org>>thesi..
- 4.<https://academiccoachingandwriting.org>>..
- 5.<https://writingcenter.unc.edu>>disser..

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Facilitate to decide the area of research

CO 2	Analyse various aspects of the chosen area
CO 3	Identify links and dependencies
CO 4	Plan to obtain the necessary resources
CO 5	Acquire the skills of documentation, citation and techniques of research writing and presentation

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	2
CO2	3	2	3	3	3
CO3	3	3	3	2	3
CO4	3	3	2	3	3
CO5	3	2	3	3	2
AVERAGE	3	2.4	2.6	2.6	2.6

II.M.A. SEMESTER - IV

MARGINAL LITERATURE

TOTAL HOURS: 5 (75 Hours)

COURSE CODE:175521

CREDITS: 4

COURSE OBJECTIVES:

1. Introduce students to Marginal Writing.
2. Identify marginal texts and peripheries.
3. Recognise the different forms of culture.
4. Respond critically to marginal writing.
5. Develop an understanding of the consequences of social exclusion and discrimination on economic growth - a poverty education, health, political participation and on the wellbeing of the marginalised social groups.

COURSE OUTLINE:

UNIT I: KEY CONCEPTS & MOVEMENTS

Marginal/Subaltern
Testimonio
Alterity (Others)
Third World
Little Magazines
Varna & Caste hierarchy
B.R. Ambedkar's Contributions to Dalit Movement
Dravidian Movement & EVR

UNIT II: PROSE

B. R. Ambedkar	:	Annihilation of Caste
Sharan Kumar Limbale	:	The Outcaste

UNIT III: POETRY

Bernard Dadie	:	I Thank You God
Naomia De Sensa	:	Let My People Go
Virginia Slim	:	Indian Girl (Adivasi)
Kabir	:	Are You Looking for Me
M.R. Renukumar	:	The Poison Fruit
Prathiba Jeyachandran	:	Dream Teller
N.K. Hanumanthiah	:	Untouchable, Yes I am!
Nam Deo Dasal	:	Man You Should Explode
Suhirtha Rani	:	I speak up bluntly

UNIT IV: DRAMA

George Ryga	:	Ecstasy of Rita Joe

UNIT V: FICTION

Kathryn Stockett	:	The Help
Corrie Ten Boom	:	The Hiding Place

RECOMMENDED TEXTBOOKS:

1. Rodrigues Valerian, Ed *The Essential Writings Of B.R Ambedkar* , New Delhi, Oxford U.P, 2002, Pg.263-305.
2. Dangle Arjun, *Poisoned Bread*, Orient Longman, Bombay ,1992.
3. Singh Chandra Nisha, *Radical Feminism And Women's Writing* , Atlantic Pub, New Delhi, 2007.

REFERENCE:

1. Dasan .M Et, Al, Eds. *The Oxford Indian Anthology Of Dalit Literature* Pg No.32-33., 168-179.

2. Azhagarasan Ravikumar, Eds, *The Oxford Anthology Of Tamil Dalit Writing*, New Delhi:Oxford U.P, 2012. Pg 5-6,163-168.
3. Miura Noriko , *Marginal Voice , Marginal Body*, Bron Walker Press, New York,2014.
4. Sarangi Joydeep, Chavapa Ghosal "*Marginal Writings In English*" Authorspress , New Delhi 2013.
5. Ribeiro Alvaro S.J &James G. Basker" *Tradition In Transition*"Clarandon Press Oxford, New York 1996.

JOURNALS:

1. Comprehensive Review Of The Literature By Deroy Sara& Hake Schutze From International Journal For Equity In Health, 18,Article No.70(2019)
2. Literature Across Boundaries –The Perception An Impact Of Francophone African Literatures, In South Africa.By –Adesenmi,Picis,158/2000: Varia .

E-LEARNING RESOURCES:

- 1.www.ambedkarpedia.com>earl..
- 2.<https://www.culturalinda.net>>..
- 3.<https://www.quora.com>>how-man..
- 4.<https://www.newyork.com>.t
- 5.<https://www.theguardian.com>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Identify marginal texts and peripheries
CO 2	Recognise the different forms of culture
CO 3	Respond critically to Marginal Writing
CO 4	Expose to various concepts of the Literature of the Oppressed

CO 5	Understand how writers' representations and literary expressions are influenced by their socio-cultural forces

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	2	3	3
CO2	3	2	3	2	3
CO3	3	3	3	2	2
CO4	2	2	3	3	3
CO5	3	2	3	2	3
AVERAGE	2.6	2.4	2.8	2.6	2.8

II M.A. SEMESTER - III
WORLD CLASSICS IN TRANSLATION

TOTAL HOURS: 5(75 Hours)

COURSE CODE:

CREDITS: 3

COURSE OBJECTIVES:

- 1.Expose the student of literature to works from European, Russian and Asian countries languages and cultures.
2. It gives the integrated knowledge of primary political, social, military events & developments in the ancient Greek and Roman world.
- 3.Traverse across global literary landscape.
4. Instill critical insight into world literature.
- 5.To study cross cultural growth and its effects.

COURSE OUTLINE:

UNIT I: INTRODUCTION**Hours: 15**

A.S. Kilner : On Poetic Translation – from The Compound Host

UNIT II: PROSE**Hours: 15**

Socrates : World's Greatest Speeches (Greek)

Adolf Hitler : World's Greatest Speech (German)

UNIT III: DRAMA**Hours: 15**

Sophocles : Antigone (Greek)

Euripides : Medea (Greek)

UNIT IV: POETRY**Hours: 15**

The Train : African

Johann Wolfgang Goethe : Roman Elegy I (Latin)

Arthur Rimbaud : Vowels (French)

Chant of Monks : Day of Reckoning (Latin)

Sappho : A Company of Soldiers (Greek)

Boris Pasternak : February Take Ink and Weep

Alexander Pushkin : Time (Russian)

Kahlil Gibran : Love one another (Lebanese)

Nalatiyar : Poem 140, 321,341,337,285

UNIT V:**Hours: 15****FICTION**

Bram Stoker's : Dracula (Hungary)

SHORT STORIES

Anton Chekhov : The Beggar (Russian)

Stapleton : The 12 Labors of Heracles (Greek)

Virgil : The Aeneid Book I – Book VI (Latin)

Book of Jonah : Old Testament (Jewish)

RECOMMENDED TEXTBOOKS:

1.Euripides, *Medea & Others Plays*, London: Penguin Classics, 1996. New York 2012.

2. Sophocles, *The 3 Theban Plays*, London,: Penguin, 1982.

REFERENCE :

1. Stapleton Michael, *A Dictionary Of Greek & Roman Mythology* , London: Cox& Wyman Limited, 1978
2. *Selected Short Stories Of Great Authors*. Up, Noida: Maple Press Classics,
3. Nathaniel Hawthorne , *Greek Myths, A Wonder Books For Girls & Boys*, New Yourk: Barnes & Noble, 2012.
4. Books Of Jonah, King James Authorised Version
5. Kalu C.Antonia, Ed. *Anthology Of Africans Literature*, Chennai: Viva Books, 2008

JOURNALS:

1. Classical World: A Quarterly Journal On Antiquity Ed.Robin Mitchell-Boyask, Temple University.,Vol-112,2019.
2. Society For Classical Studies Founded In 1869, As The American Philological Association.

E-LEARNING RESOURCES:

- 1.classics.mit.edu>browse-sophocles
- 2.www.gutenberg.org>ebooks.
3. [https://liberalarts.utexas.edu>about](https://liberalarts.utexas.edu/about)
- 4.https://www.theguardian.com>..
- 5.https://www.kilnerjar.co.uk

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Able to traverse across global literary landscape
CO 2	Get a panoramic view of various cultures of the world through the literary compositions
CO 3	Develop an integrated knowledge of political, social and cultural movements
CO 4	Enable to study the cross-cultural growth and its effect on the literary world
CO 5	Develop interest in research using secondary literature related to the prescribed texts

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	2	3
CO2	3	2	3	2	2
CO3	2	3	2	3	3
CO4	3	2	3	2	2
CO5	2	3	3	2	3
AVERAGE	2.6	2.4	2.8	2.2	2.6

II M.A. SEMESTER - IV

AN APPROACH TO SET /NET

TOTAL HOURS: 5 (75 Hours)

COURSE CODE: 175522

CREDITS: 3

COURSE OBJECTIVES:

1. Read literature in-depth
2. Critically analyse the wide range of literary works
3. Acquire competence to review & master literature
4. Excel in teaching methods and techniques.
5. Expose to multiple choice questions.

COURSE OUTLINE:

Unit I : An Introduction to the Periods of British Literature Hours: 15

Unit II : An Introduction to American Literature Hours: 15

Unit III : An Introduction to New Literature Hours: 15

Unit IV : An Introduction to Criticism Hours: 15

Unit V : An Introduction to English Language & Linguistics Hours: 15
Literary Terms

RECOMMENDED TEXTBOOKS:

1. Lodge David , *Modern Criticism & Theory* ., 2nd Ed Person Education Ltd., Parparganj ,Delhi., 2004.
- 2.Wimsatt2.William K. & Cleanth Brooks , *Literary Criticism – A Short History* , Yale University, Connecticut, 1957.

REFERENCE :

1. Abrams. M.H., *A Glossary Of Literary Terms*, 3rd Edition, Cornelf Univ ; Hole Rinehart & Winston In Inc., 1971
- 2.Arthur Compton & Rickett., *A Short History Of English Literature*, Dodge Pub Co New York ,2007
- 3.Daniel Hoffman., *Harvard Guide To Contemporary American Writing*, Belknap Press ,Harvard University 1982.
- 4.Nayar Pramod K., *Literary Theory Today* Orient Blackswan Pvt Ltd Hyderabad, 2016.
5. Selden Raman ., *A Reader's Guide To Contemporary Literary Theory*, Asia Book Club

JOURNALS:

1. An Objective & Analytical Approach To English Literature For Ugc Net-Jrf/Slet/Set/Prtand Other By, Jha Vivekanand, New Delhi Publisher , Cp,2011-2013.

2. Contemporary Literary Criticism , Detroit ,Gale,Cengage Learning.

E-LEARNING RESOURCES:

1.<https://www.jagranjosh.com>>u

2.www.netugc.com>2010-june-ugc..

3.<https://grade.up>>types-of-res

4. <https://www.researchgate.net>>3247

5.<https://www.c.sharpcorner.com>>co.

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Excel in teaching methods and techniques
CO 2	Get updated, by critically analysing the wide range of literary works
CO 3	Optimise the learning outcome
CO 4	Expose to multiple choice questions
CO 5	Overcome the challenges in clearing SET / NET

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5

CO1	3	2	2	3	2
CO2	2	3	2	3	2
CO3	3	3	3	2	3
CO4	3	3	2	2	3
CO5	3	3	2	3	2
AVERAGE	2.8	2.8	2.2	2.6	2.4

SOFT SKILLS – IV

CAREER ORIENTED SKILLS

PURPOSE To enhance holistic development of students and improve their employability skills

INSTRUCTIONAL OBJECTIVES

1. To develop inter personal skills and be an effective goal oriented team

player 2. To develop professionals with idealistic, practical and moral values
3. To develop communication and problem solving skills 4. To re-engineer attitude and understand its influence on behavior

UNIT I – RESUME PREPARATION

Definition and difference of Resume, Curriculum vitae, bio data – Importance of resume – preparing resume – Importance points / field – Structure of resume –Types of resume – Appearance - Avoidance of misspelling – Chronological resume – Functional resume – Online resume – cover letter

UNIT II – INTERVIEW SKILLS

Definition – Preparing for interview – Purpose of interview – Parts of interview - Researching the company – Dressing for the interview – punctuality – Check out the competition – Types of Interview – Body language – Strategy for interview skills – Interview communication – Common Interview questions.

UNIT III – GROUP DISCUSSION

Definition – Characteristics of GD – Prerequisites of GD – Benefits in GD – Need of GD in interview - Preparation for GD - Assessment of GD – Discussion Etiquette – Methodology – Components – Positive and negative traits – Important points in GD – Do's and Don'ts in GD – Accept Criticism

UNIT IV – CAMPUS TO CORPORATE

Introduction of corporate - Hierarchy of corporate – Understanding corporate policy – Branding YOU- Corporate jungle – Positive attitude –First impression – Dressing for success – Greeting and Introduction – Meeting and teleconference etiquette –Effective communication – Listening and team building – managing conflict in corporate – workplace ethics.

UNIT V – ORGANIZATION BEHAVIOUR

Introduction : Nature of management – The evaluation of management thought – Task of professional manager – Manager and environment – Levels of management – System approach to management – steps in planning and decision making process –Impact of technology on organizational design – Business Ethics – Importance of business ethics

BOOKS TO REFER

- A Workbook to Develop Skills for Employment by Frederick H. Wentz
- A Soft Skills Training Workbook by Frederick H Wentz
- Interpersonal skills for entrepreneur by mellisa conterasa
- Schmerhorn, J.R., Management, 11th Edition, Wiley, July 2012
- Schmidt, D. and Willott, E., Environmental Ethics, Oxford University Press, 2011.

**QUAID-E-MILLATH GOVT. COLLEGE FOR WOMEN
(Autonomous)**

Anna salai, Chennai - 600 002.

M.A. TAMIL

SYLLABUS



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

OFFERED FROM THE ACADEMIC YEAR 2017-2018

CONTENTS	Page No
Rules and Regulations for the Programme	
Programme outcomes	
Programme Specific Outcomes	
Programme Profile	
Evaluation pattern for CA	
Rubrics for CA Evaluation	
Evaluation Pattern for End Semester	
Course Profile – Semester I	
Course Profile – Semester II	
Course Profile – Semester III	
Course Profile – Semester IV	
Course Profile – Semester V	
Course Profile – Semester VI	

**QUAID – E- MILLATH GOVERNMENT COLLEGE FOR WOMEN,
(AUTONOMOUS)
CHENNAI – 600 002**

Postgraduate Courses

Choice Based Credit System

Quaid – E- Millath Government college for Women (Autonomous) offers the semester System of Education with credits for PG courses. Credit simply means the weightage given to what is taught and what is learnt. It is normally related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design, Each course is designed variously under lectures/ tutorials/ seminar/ project work/ Practical training/ viva voce etc. to facilitate effective teaching and learning and the credits are assigned according, depending on the content and the specialization.

The minimum credit requirement for a two – year PG course shall be 90 working days.

RULES AND REGULATIONS:

1.Duration

a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semesters, the second academic year, the third and fourth semesters.

b. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year.

2. Course of Study

The course of study for Postgraduate Degree Courses shall comprise of core courses and electives.

3. System of Credits

year	No. of Papers			Marks	Credits				Total
	Core	Elective &E D Elective	Soft Skill		Core	Elective &E D Elective	Soft Skill	Internship	
I Year	7	3 + 1	2	1300	28	12	2 x 2 = 4	2	
II Year	8	2 + 1	2	1300	32	09	2 x 2 = 4		
Total	15	5 + 2	4	2600	60	21	8	2	91

4. Passing Minimum

A candidate shall be declared to have passed in each paper / practical of the Main Subject of

Study wherever prescribed if she secures **NOT LESS THAN 50%** of the marks prescribed for the examination. She shall be declared to have passed the whole examination, if she passes in all papers and practical wherever prescribed, as per the scheme of examinations, earning 90 credits.

5. Eligibility for the award of Degree

Candidates must secure a minimum of **50%** of marks in the Semester End Examinations. A candidate must secure 8 credits in soft skills and 2 credits in internship in addition to 90 credits from Core and Elective courses to obtain a Post Graduate Degree.

6. Ranking

Candidates who pass all the examinations prescribed for the course in the

FIRST APPEARANCE ALONE are eligible for classification / Ranking / Distinction.

M.A. DEGREE COURSE

PROGRAMME OUTCOME

On completion of the programme, the learner is able to:

1. Apply quality skills in all modes.
2. Identify the essence of subject knowledge.
3. Demonstrate entrepreneur, creative and communication skills.
4. Acquire thorough knowledge of the subject.
5. Analyse the fundamental research.

PROGRAMME SPECIFIC OUTCOMES

PSO1: Illakkiya, Illakkana, Mozhiyeal matrum thamizhiyeal kurugalai parunthupatta nokkil anugi vivarithal.

PSO2. Illakkiya, Illakkana, Mozhiyeal matrum thamizhiyeal thanithirangalai panmuga nokkil aithal.

PSO3. Illakkiya, Illakkana, Mozhiyeal matrum panithervugallukkana thamizhiyeal kurugalai thodarbudaya thuraigalodu oppittukattuthal.

PSO4. Illakkiya, Illakkana, Mozhiyeal kurugalai samuthayamozhiyeal vazhakkiyalodu poruthi thelithal.

PSO5. Illakkiya, Illakana, Mozhiyeal kurugalai thelinthu mathiya, manila velai vaipugalai peruvatharkkana thaguthigalai sirappaga, ariya seiyyum panithervu sarntha kattral thirangai mempadaseitha.

PSO1 :,yf;fpa/ ,yf;fzk;/ bkhHpapay; kw;Wk; jkpHpapay; TWfisg; gue;Jgl;l neh;fpy; mQfp tpthpj;jy;.

PSO2 :,yf;fpa/ ,yf;fzk;/ bkhHpapay; kw;Wk; jkpHpapay; TWfspd; jdpj;jpwd;fisg; gd;Kf neh;fpyy; EQfp Ma;jy;.

PSO3 :,yf;fpa/ ,yf;fzk;/ bkhHpapay; kw;Wk; gzpj;njh;t[fSf;fhdj; jkpHpapay; TWfisj; bjhlh;g[ila JiwnshL xg;gpl;Lf; fhl;Ljy;.

PSO4 :,yf;fpa/ ,yf;fzk;/ bkhHpapay; kw;Wk; jkpHpapay; TWfisir; rKjhapay; tHf;fpanyhL; bghUj;jpj; bjspjy;.

PSO5 :,yf;fpa/ ,yf;fzk;/ bkhHpapay; kw;Wk; TWfisj; bjspe;J kj;jpa/ khepy ntiy tha;g;g[fisg; bgWtjw;fhdj; jFjpfisir; rpwg;ghff mwpar; bra;a[k; gzpj;njh;t[rhh;e;j fw;wy; jpwd;fis nkk;glr; bra;jy;

EVALUATION PATTERN FOR CA

Distribution of marks for Continuous Assessment:- Theory

Test		Total	Assignment/Seminar/ Creative Presentation/ Assignment on glossary			Model Exam	Attendance	Total	Reduced to
1	2	40	1	2	3	25	10	100	25
20	20		10	10	5				

Test (two) : 40 Marks

Assignment / Seminar/ Creative Presentation/

Assignment on glossary : 25 Marks

Model Examination : 25 Marks

Attendance : 10 Marks

Attendance percentage

90 & above : 10 Marks

80 & above : 9 Marks

75 & above : 8 Marks

65 & above : 7 Marks

55 & above : 6 Marks

End Semester Theory Examination: Question Paper Pattern:

Section A Short answers(answer ANY TEN questions) : 10 X 2 = 20 Marks

Section B Paragraph answers : 5 X 5 = 30 Marks (5 out of 8)

Section C Essay : 3 X 10 = 30 Marks (3 out of 5)

Total : 75 Marks

Distribution of CIA marks – Practical

Submission of observation : 30 Marks

Tests on Spotters : 20 Marks

Practical Model Exams : 50 Marks

Total : 100 Marks

Reduced to : 25 Marks

End Semester Practical Examination: Question Paper Pattern:

Practical Maximum marks : 75

(Given in the Syllabus)

Part IV

Semester End Examination : 60 Marks

Continuous Internal Assessment : 40 Marks

Distribution of CIA Marks:

Seminar/Presentation	Assignment / Term Paper	Written/ Oral Test	Total
20	10	10	40

Semester End Exam: Theory Paper : 60 Marks - Duration : 2.30 hours

Question paper pattern: 10x6 Marks = 60 Marks (10 out of 15)

**Kjy; gUtk; -,f;fhy ,yf;fpak;
First Semester – Ikkala Ilakkiyam**

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

1. g[Jf;ftpij/ tot';fisa[k;/ ghLbghUisa[k; mwpar; bra;jy;.
2. ciueilapd; njhw;wk;/ tsh;r;rpa[k;/ jdpj; jkpGf;F jkpHwp"h;fspd; bjhz;Lk; czh;j;jg;gl;IJ.
3. r_fj;ij gpujppgypf;Fk; fUtpahf ehty; ,yf;fpa';fs; njhd;wpd vd;gij vLj;Jf; Twy;.
4. rpWfijapd; rpwg;gk;r';fs; gw;wp vLj;Jr; brhy;yg;gl;IJ.
5. ehlf';fs;/ r_f rpe;jida[lD; vGjt[k;/ eof;ft[k; gad;gl;IJ vd;gijf; TWjy;.

Course Objectives :

1. Puthukavithai, vadivangalaiyum, paduporulaiyum ariyaseithal.
2. Urainadaiyin thotram, valarchi, thanithamizhukku thamizharignargalin thondum unarthapattathu.
3. Samoogathai prathibalikkum karuviyaga naval ilakkiyangal thondrina enbathai eduthukooral.
4. Sirukathaiyin sirappamsangal patri eduthu sollapattathu.
5. Nadagangal, Samooga sindanaiyudan ezhuthavum, nadikkavum payanpattathu enbathai kooruthal.

myF : 1 : ftpij

ftpj tpisahL;L - ,yf;fpag; gz;g[fs; - ftpijapd; Kf;fpaj;Jtk; - ftpij/ bra;a[s;/ ghl;L - ftpij mDgtk; - thrpg;g[Kiw (1/2/3) - totk;/ gokj;jd;ik - mzpffh; bkhHp (cUtk;) - ahg;g[xyp eak;/ re;jk; - ftpij kjpg;gPL - ftpij tpkh;rdk;. 'bjhiye;Jnghd eil tz;ofs;' - K. bry;yh.

Alagu – 1

Kavithai Velaiyaatu – Elakkiya Panbugal – Kavithaiyin Mukkiyatuvam – Kavithai, Seiyul, Paatu – Kavithai Anubavam – Vaasippu Murai (1,2,3) – Vadivam, Padimatanmai – Anigaar Mozhi (Vuruvagam) – Yaapu, Oli Nayam, Santham – Kavithai Matipeedu – Kavithai Vimarsanam. ‘Tolaintupona Nadaivandigal’ – M. Sella.

myF :2: ciueil

ciueilapd; njhw;wk;/ tsh;r;rp - ciueilg; ghFghLfs; - ciua[k;/ ciueila[k; - jkpH; ciueilia tsh;j;jth;fs; : MWKfehtyh;/ c.nt.rhkpehijah;/ kiwkiy mofs;/ jpU.tp.f. - ghujpf;Fg; gpd; ciueil. “hdujk;,” - ghujpahh;.

Alagu – 2

Vurainadaiyin Totram, Valarchi – Vurainadai Paagupaadugal – Vuraiuum, Vurainadaiyum – Tamizh Vurainadaiyai Valarthavargal ; Aarumuga Naavalargal, U.V. Saamynaathayir, Maraimalai Adigal, T.V.K. Baaratikku Pin Vurainadai. ‘Gnanaratham’ – Baaratiyaar.

myF : 3 : g[idfij (m) ehty;

fhtpaKk; ehtYk; - ciueila[k;/ ehtYk; - ehtypyf;fpaKk; jdpkdpjf; bfhs;ifa[k; - M';fpy _yKk; jkpH;j; jGtYk; - rpWfijapd; nja;t[k; ehtypd; tsh;r;rp[a[k; - ,aw;gz;g[k; ajhh;j;jthjKk; - jkpH; ehtypd; mz;ikf; fhyg;ngfh;Ffs; - ehty; ,yf;fpaf; TWfs; - tiffs; - bfhs;iffs;. ‘fhpg;g[kzpfs;,” - ,uh#k;fpU\;zd;.

Alagu – 3: Punaikkathai (or) Novel

Kaaviyamum Naavalum – Vurainadaiyum, Naavalum – Naavalilakkiyamum Tanimanita Kolkaiyum – Angila Muulamum Tamizhtazhuvalum – Sirugathaiyin Teivum Naavalin Valarchiyum – Eyarpanpum Yatharthavaathamum – Tamizh Navalin Anmai Kaala Pokkugal – Naaval Elakkiya Kurugal – Vagaigal – Kolkaigal. ‘Karippu Manigal’ – Rajam Krishnan.

myF :4: rpWfij

rpWfij: mwpKfk; - g[idfija[k; rpWfija[k; - rpWfijapd; njhw;wk; - fhe;jpa[fk; - fy;fp - kzpf;bfhoa[k;/ rpWfija[k; - g[Jikg;gpj;jd;/ F.g.uh./ bkstdp/ b#afhe;jd; fijfs; - rpWfij tsh;r;rpapy; gljpa a[fk; - kPz;Lk; te;j kzpf;bfhof; FG - jdp bewpahsh; ,Uth; - gljpa guk;giu - tsh;r;rp tsk; (1965 tiu) - ,y';if/ knyrpahtpy; jkpH;r; rpWfij - rpWfijf; bfhs;iffs;. ‘jkpH;r;rpWfijf; fs";rpak;,” - m.rpjkguehjr; brl;oahh;/ bjhFjp-1.

Alagu – 4: Sirukathai

Sirukathi; Arimugam – Punaikathaigalum Sirukathaiyum – Sirukathaiyin Totram – Ganthiyugam – Kalki – Manikodiyum, Sirukathiyum, Putumaipithan, K.P.R. Mowli, Jayakanthan Kathaigal – Sirukathai Valarchiyil Putu Yugam – Mindum vanta Manikodi Kuzhu – Tani Neriylar Eruvar – Putiya Parambarai –

Valarchi Valam (1965 Varai) – Ilangai, Malasiyavil tamizh sirukathai – Sirukathai kolkaikal “Tamizhsirukathai kalansiyam ” – A .Sithamparanatha sattiyaar , Thokuthi – 1 .

myF :5: ehlfk;

jkpH; ehlf tuyhW - ehlf tpsf;fk; - njhw;wKk; tsh;r;rpak; - ehlf ,yf;fzk; - Mya';fs; tsh;j;j mU';fiy - rKjha ehlfj; njhw;wk; - ehlf Mrphpah;fs; - ehlf rghf;fs; - kWkyh;r;rpF tpj;jpl;lth;fs; - g[Jik ehlf';fs; - eog;g[f; fiy - ehlfj;jpy; gpur;rhuk; - ehlf tiffSk;/ bfhs;iffSk;. ‘busj;jpuk; gHF’ - K.,uhkRthkp.

Alagu – 5: Nadagam

Thamizh nadaka varalaaru – Nadaka vilakkam – Thottramum valarsiyum – Nadaka ilakkanam – Aalayankal valartha arunkalai – Samuthaya nadaka thottram – Nadaka aasiriyarkal – Nadaka sapakkal – Marumalarsikku viththidavarkal – Puthumai nadakakkal – Nadippu kalai – Nadakaththil birasaram – Nadaka vakaikalum , Kolkaikalum “ ravththiram pazham ” – M . Ramasuvami .

ghpe;Jiu E]y;fs;

1. bjhiye;Jnghd eil tz;ofs;/ K.bry;yh/ ghith gjpg;gfk;/ brd;id.
2. "hdujk;/ ghujpahh;/ jhkiu gg;spnfd;!; (gp)ypl;/ brd;id-98.
3. fhpg;g[kzpf; / ,uh#k; fpU\;zd;.
4. jkpH;r;rpWfijf; fs";rpak;/ m.rpj;k;guehj brl;oahh;/ cyfj;jkpHhuha;r;rp epWtdk;.
5. busj;jpuk; gHF/ K.,uhkRthkp/ thdjp gjpg;gfk;/ brd;id.

Recommended Book

- 1.Tholaitthuppona nadai vandigal , M . Salla , Pavai pathipakam , Chennai .
- 2.Gnanaratham , Parathiyar , Thamarai paplikasans (B) lip , Chennai – 98 .
- 3.Karippu manikal , Rajam krishnan .
- 4.Thamizhsirukathai kalansiya , A . Sithamparanatha sadiyar, Yulakathamizharayssi niruvanam .
- 5.Rowthiram pazhaku , M.Ramasuvami , Vanathi pathipakam , Chennai .

ghh;it E]y;fs;

1. ftpijapay;/ g{uzr; re;jpud;/ cyfj; jkpHhuha;r;rp epWtdk;/ brd;id-113.
2. ghujpf;Fg; gpd; ciueil/ ty;ypf;fz;zd;/ ghhp epiyak;/ brd;id-108.
3. jkpH; ehty; ,yf;fpak;/ fyhejp f. ifyhrjgp/ Fkud; gg;sp\h;!;/ brd;id-26.
4. jkpHpy; rpWfijapd; njhw;wKk; tsh;r;rpak;/ fhj;j;jpnf R. rptj;jk;gp/ epa{ br";Rhp g[f; At[;!; (gp) ypl;/ brd;id-98.
5. ehlf; fiy/ mt;it jp.f. rz;Kfk;/ ghhp epiyak;/ brd;id-108.

6. ,yf;fpaj; jpwdha;t[,r';fs;/ bfhs;iffs;/ mu';f. Rg;igah/ ghith gg;spnf\ld;!/ brd;id-14.

Reference Books

1. Kavithaiyiyal, Purana Santhiran, Ulaka Thamizharaysi Niruvanam, Chennai – 113 .
2. Bharathikkuppin Urainadai, Vallikkannan, Pari Nilayam, Chennai-108.
3. Thamizh Novel Ilakkiyam, Kalanithi K. Kailasabathi, Kumaran Publishers, Chennai-26.
4. Thamizhil Sirukathaiyin Thotramum Valarchiyum, Karthike S. Sivathambi, New Century Book House (P) Ltd., Chennai-98.
5. Nadaga Kalai, Avvai T.K. Shanmugam, Pari Nilayam, Chennai-108.
6. Ilakkiya Thiranaivu Isangal, Kolgaigal, =Aranga Subbaiya, Pava Publications, Chennai-14.

<https://www.youtube.com/watch?v=08mjXJSCpE8>

https://www.youtube.com/watch?v=pPBe6PyO_jk

<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	ftpij tot';fshd iAf;T/ brd;hpa[/ Ff;T/ ypkhpf; nghd;wtw;iw mwpe;J bfhz;ldh;. Kavithai vadivangalana Hicoo, sentriyu, kukoo, limarik pondravatrai arinthu kondanar.
CO2	:	jkpH; ciueilapy; tlbkhHp fyf;fhky; vGjpa rhd;nwhh;fisg; gw;wp mwpe;J bfhz;ldh;. Thamizh urainadaiyil vadamozhi kalakkamal ezhuthiya sandorgalai patri arinthu kondanar.
CO3	:	ehtypd; njhw;wKk; tsh;r;rpa[k; gw;wp mwpe;J bfhz;ldh;. Novelin thotramum, valarchiyum patri arinthu kondanar.
CO4	:	rpWfij r_fr;rPh;epiyia vLj;Jf;fhl;Ltij mwpe;J bfhz;ldh;. Sirukathai samoogaseernilaiyai eduthukattuvathai arinthu kondanar.
CO5	:	ehlfk; mf;fhy/ ,f;fhy ehlfj;jpd; ed;ikia g[hpe;J bfhz;ldh;. Nadagam, akkala, ikkala nadagathin nanmaiya purinthu kondanar.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2
CO2	3	3	3	2	3
CO3	3	2	3	3	2
CO4	3	3	2	3	2
CO5	3	2	3	2	3
AVERAGE	3	2.6	2.8	2.6	2.4

**jhs;: 2 : mw ,yf;fpak;
Paper : 2 : Ara Ilakkkiyam**

Total Hours	:		:	Course Code
Credits	:		:	L.T.P.

nehf;fk; :

6. mw ,yf;fpaj;jpd; njhw;wk;/ nfhl;ghLfs; Mfpatw;iiw mwptjd;_yk; mwj;jpd; nkd;ikia mwpantz;Lk; vd;w nehf;fk;.
7. gjpbdz;fPH;f;fzf;F E]y;fs; Fwpj;j gue;Jgl;l vy;iyia khzth;fs; mwpjy; ntz;Lk;.
8. khzth;fs; mwtHpahf brd;W ey;y giHia tFj;Jr; rPhpa thH;tpid nkW;bfhs;sntz;Lk; vd;w nehf;fk;.
9. ePjp/ cz;ik/ xGf;fk; Kjyhdtw;iw jhk; mwpe;J bfhs;tnjhL/ jk;ikr; rhh;e;njhUf;Fk;. mjd; ,d;wpaikahikia vLj;Jiuf;f ntz;Lk;.
10. rKjhaj;ijr; rPh;gLj;Jk; tz;zk;/ vjph;fhyj;jpy; g[jpa mw ,yf;fpa';fisg; gilf;f ntz;Lk;.

Course Objectives :

6. Ara ilakiyathin thotram, kotpaadugal aagiyavatrai arivadhan moolam arathin menmaiyyai ariya vendum endra nokkam.
7. Padhinenkeezh kanaku noolgal kuritha parandhu patta ellaiyyai maanavargal aridhal vendum.
8. Maanavargal aravazhiyaga sendru nalla pazhaiyai vaguthu seeriya vaazhvinai merkolla vendum endra nokkam.
9. Needhi, unmai, ozhukkam mudhalaanavatrai thaam arindhu kolvadhodu thammai saarndhorukum. Adhan indriyamaiyamaiyyai eduthuraikka vendum.
10. Samudhayathai seerpaduthum vannam, edhiralathil pudhiya ara ilakiyangalai padaikka vendum.

myF -1 :

MI;rp khw;wKk; mw ,yf;fpaj; njhw;wKk; - mw ,yf;fpaf; nfhl;ghLk; cs;slf;fKk; - gjpbdz;fPH;f;fzf;fpy; mwE]y;fs; gFg;g[- ,ilf;fhy mwE]y;fs; - gFg;g[- gpw;fhy mwE]y;fs; gFg;g[.

Alagu – 1

Aatchi maatramum ara ilakkiya thotramum- ara ilakkiya kotpaadum ulladakkamum- padhinenkeezh kanakil ara noolgal paguppu- idaikkala ara noolgal-paguppu-pirkaala ara noolgal paguppu.-----

myF -2 :

1. jpUf;Fws; - 40 Fw;ghf;fs;
 1. el;g[
 2. el;ghuha;jy;
 3. jP el;g[
 4. Tlh el;g[
2. ehd;kzpf;foif - 30 ghly;fs; (flt[s; thH;j;J eP';fyhf) (3-12/ 15-17/ 20/ 22/ 23/ 25/ 26-28/ 32/ 34/ 38-40/ 48/ 49/ 61/ 62/ 71).

Alagu – 2

1. Thirukkural - 40 Kuratpakkal
 1. Natppu
 2. Natparaydhal
 3. Thee natpu
 4. Kooda natpu
2. Naanmanikadigai - 30 Padalgal (Kadavul vaazhthu neengalaga) (3-12, 15-17, 20, 22, 23, 25, 26-28, 32, 34, 38-40, 48, 49, 61, 62, 71).

myF -3 :

1. ed;bdwp - 1-30 ghly;fs; (30 ghly;fs;) (flt[s; thH;j;J eP';fyhf)
2. thf;Fz;lhk; - 1-30 ghly;fs; (30 ghly;fs;) (flt[s; thH;j;J eP';fyhf)

Alagu – 3

1. Nanneri-1-30 padalgal(30 padalgal)(kadavul vaazhthu neengalaga).
2. Vaakundaam-1-30 padalgal(30 padalgal) (kadavul vaazhthu neengalaga)

myF - 4:

ePjp btz;gh - 70 ghly;fs;
 (1-16/ 18-22/ 24/ 26/ 27/ 28-32/ 33/ 35-37/ 41-45/ 47-49/ 53-55/

57/ 59/ 61/ 64/ 65-67/ 70/ 71/ 73/ 74/ 76-78/ 80/ 81/ 82/ 84/ 85-87/
89-92/ 99)

Alagu – 4

Needhi venpaa-70 padalgal

(1-16, 18-22, 24,26,27,28-32,33,35-37, 41-45, 47-49, 53-55, 57, 59, 61,
65-67, 70, 71, 73, 74, 76-78, 80, 81, 82, 84, 85-87, 89-92, 99)

myF - 5:

1. xsit Fws; - 1-50 Fws;fs;
2. ghujpahh; Mj;jpr;No - 1-50 ;

Alagu – 5

1. Avvai kural- 1-50 kuralgal
2. Baaradhiyar aathichoodi – 1-50

ghpe;Jiu E]y;fs;:

1. xsit Fws;/ Mh;.rp.nkhfd; (g.M) jhkiu E]yfk;/ tlgHdp/ brd;id-26/ 2000.
2. jpUf;Fws;/ ghpnkyHfUiu/ bjd;dpe;jpa irtrpj;jhe;j E]w;gjpg;g[f;fHfk;/ brd;id-18/ 2007.
3. ghujpahh; Mj;jpr;No/ rhh;g;gjpg;gfk;/ brd;id-14/ 2008.
4. ed;bdwp/ ePjpf;fs";rpak;/ epa{br";Rhp g[f;At[!; (gp) ypl;./ mk;gj;J]h;/ brd;id-98/ 2006.
5. ePjpbtz;gh _yKk;/ ciua[k; / lhf;lh; fjph; KUF/ rhujh gjpg;gfk;/ brd;id-14/ 2007.
6. thf;Fz;lhk;/ ePjpf;fs";rpak;/ epa{ br";Rhp g[f; At[!; (gp) ypl;./mk;gj;J]h;/ brd;id-98/ 2006.

Recommended Book

1. Avvai kural, R.C.Mogan (pa.aa) thaamarai noolagam, vadapazhani, Chennai-26,2000.
2. Thirukkural, parimelazhagarurai, thennindhiya saiva sidhandha noorpadhippu kazhagam, Chennai-18,2007.
3. Baaradhiyar aathichoodi, saarpadhippagam, Chennai-14, 2008.
4. Nanneri, needhi kalanjiyam, new senjuri book house (p) ltd, ambathoor, Chennai-98, 2006.

5. Needhi venpaa moolamum, uraiyum, doctor kadhira murugu, saaradha padhippagam, Chennai-14, 2007.
6. Vaakkundam, needhi kalanjiyam, new senjuri book house (p) ltd , ambathoor, Chennai-98,2006.

ghh;it E]y;fs;

1. mw ,yf;fpaf; fs";rpak;/ Kidth; f.g. mwthzd;.
2. jpwdha;t[k;/ jkpH; ,yf;fpaf; bfhs;iffSk;/ Kidth;.e. gpr;rKj;J.
3. g[jpa neh;fpy;/ jkpH; ,yf;fpa tuyhW/ Kidth;. jkpHz;zy;.

Reference Books

7. Ara ilakkiya kalanjiyam, munaivar ka.pa. aravaanan
8. Thiranaayvum, tamizh ilakkiya kolgaigalum, munaivar.na.Picha muthu.
9. Pudhiya nokkil, tamizh ilakkiya varalaru, munaivar. Tamizhannal.

<http://www.tamilvu.org/ta/library-l2100-html-l2100ind-128184>

<http://www.tamildigitallibrary.in/book-detail.php?id=jZY9lup2kZl6TuXGIZQdjZp1luMy&tag=%E0%AE%A4%E0%AE%BF%E0%AE%B0%E0%AF%81%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AF%81%E0%AE%B1%E0%AE%B3%E0%AF%8D%20%E0%AE%A8%E0%AF%80%E0%AE%A4%E0%AE%BF%20%E0%AE%87%E0%AE%B2%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AE%BF%E0%AE%AF%E0%AE%AE%E0%AF%8D%20%20%20%E0%AE%A4%E0%AE%BF%E0%AE%B0%E0%AF%81%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AF%81%E0%AE%B1%E0%AE%B3%E0%AF%8D%20%E0%AE%86%E0%AE%B0%E0%AE%BE%E0%AE%AF%E0%AF%8D%E0%AE%9A%E0%AF%8D%E0%AE%9A%E0%AE%BF%20%20%20Tirukkural:%20A%20Didactic%20Literature#book1/>
<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	mw ,yf;fpaj;jpd; njhw;wj;ija[k;/ tsh;r;rpiaa[k; mwpaKofpwJ. Ara ilakkiyaththin, valarchiyaiyum aria mudigirathu.
CO2	:	khzth;fs; Fws;tHpr; brk;ikahf ele;J thH;tpy; gad;bgWfpd;wd. Manavargal Kural vazhi semmaiya nadanthu vazhvil payanperuginrana.
CO3	:	ed;bdwp fhl;Lk;/ tHpapy; brd;W jk;thH;tpid nkd;ik bgwr; bra;fpd;wdh;. Nanneri kattum, vazhiyil sendru tham vazhvinai menmai pera seithanar.

CO4	:	vy;nyhUf;Fk; bghJthd ePjp/ neh;ik/ xGf;fk; Kjyhd TWfisj; jhKk;/ jk;;ikr; rhh;e;njhiua[k; gpd;gw;wr; bra;tjd; _yk; neh;ikahd/ xGf;fk; epiwe;j tU';fhyr; rKjhak; cUthf tHp gpwf;fpwJ. Ellorukkum pothuvana neethi, nermai, ozhukkam muthalana koorugalai thamum, thammai sarnthoraiyum pinpatra seivathan moolam nermaiyaana, ozhukkam niraintha varungala samudhayam uruvaga vazhi pirakkirathu.
CO5	:	gpw;fhy ,yf;fpa';fshd xsitFws;/ ghujpahh; Mj;jpr;Noapd; tHp kpf vsa Kiwapy; mwxGf;fj;ijg; ngQKofpwJ. Pirkala ilakkiyangalana Avvaikural, Bharathiyar Aththichoodiyin vazhi miga eliya muraiyil ara ozhukkathhthai pedumudigirathu.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	2	2	3	2
CO3	2	3	3	2	3
CO4	3	2	2	3	3
CO5	2	3	3	2	2
AVERAGE	2.6	2.6	2.6	2.6	2.6

rpw;wpyf;fpak; Sitrilakkiyam

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

11. ,s';fiyapy; mwpKfkhd rpw;wpyf;fpa ,yf;fpa totk;/ tiffs; gy;jug;gl;l mjd; ,yf;fpa';fis tphpthf mwpjy;.
12. rpw;wpyf;fpak; vDk; ,yf;fpaj;jpd; njhw;wk;/ tsh;r;rp/ bewpKiw/ bfhs;iffis mwpjy;.
13. cyh/ fyk;gfk;/ jpUkz thH;j;J/ mk;khid nghd;w tiffis/ mjpyike;j E]y;fis mwpjy;.
14. 18-19-Mk; E]w;whz;od; rKjha tuyhW/ kf;fspd; thH;f;if Kiw/ gpd;dzp ,tw;iw ,t;tpyf;fpa';fs; _yk; mwpjy;.
15. fhye;njhWk; ,yf;fpa tot';fSk;/ ghL bghUs;fSk; mila[k; khw;wk; rKjha murpay; khw;w';fshy; vd;gij mwpe;J ,d;iwa NHypy; khzth;fs; mij Kd;dpWj;jp gilg;ghsp MtJ vd Kaw;rpq;gJk;/ KobtLg;gJk; ,g;ghlj;jpl;l;jpd; gadhFk;.

Course Objectives :

11. Ilankalaiyil arimugamaana setrilakkiya ilakkiya vadivam, vagaikal paltharappatta adhan ilakkiyangalai virivaga aariythai.
12. Setrilakkiyam eanum ilakkiyathin dhottram, valarchi, Nerimurai, kollagaikal arithal.
13. Uaala, Klambagam, Thirumana vaazhthu, Ammaanai poondra vagaikalai, adhilamaitha noolkalai arithal.
14. 18-19- aam nootraantin samudhaya varalaaru, Makkalin vazhakaiyai murai pinnani ivatrai ivilakkiyangal moolam arithal.
15. Kalandhorum ilakkiya vadivangalum, Paadu porulkalum adaiyum matram samudhaya arasiyal maatrangallal eanbathai arinthu indraya suzhalil maanavargal adhai munniruthi padaippali aavadhu yena muyarchepathum, mudiveduoathum ippadathitathin payanaagum.

myF -1 :

rpw;wpyf;fpaj; njhw;wk; - tsh;r;rp - ghLbghUs; tiffs; - ghl;oay; E]y;fs; tiff;gLj;Jk; Kiw/ ,yf;fzk; - bewpKiwfs; - bfhs;iffs;.

Alagu : 1

Sittrilakkiya thottram – Valarchi – Paduporul vagaigal – Pattiyal Noolgal – Vagaipaduthum murai, ilakkanam – Nerimuraigal – Kolgaigal.

myF - 2:

jpUf;ifyha "hd cyh (E)y; KGika[k;] - nrukhd; bgUkhs; ehadhh;.

Alagu : 2

Thirukailaya Gnana ula (Nool Muzhumaiyum) – Seraman Perumal Nayanar.

myF - 3:

jpUtu';ff; fyk;gfk; (E)y; KGika[k;] mHfpa kzthsjhrh;.

Alagu : 3

Thiruvaranga Kalambagam (Nool Muzhumaiyum) Azhagiya Manavaladasar.

myF - 4:

fpj;njhpak;khs; mk;khid - tPukhKdpth;
vz;kh; fhij (1-99 ghly;fs;)

Alagu : 4

Kiththeriyammal Ammanai – Veeramamunivar.
Enmaar Kaathai (1-99 Padalgal)

myF - 5:

rPjf;fhjp jpUkz thH;j;J (E)y; KGika[k;] - vl;lag[uk; ckWfj;jhg; g[yth;.

Alagu : 5

Seethkkathi Thirumana Vazhthu (Nool muzhumaiyum) – Ettayapuram Umarukaththapulavar.

ghpe;Jiu E]y;fs;

1. jpUf;ifyha "hd cyh/ nrukhd; bgUkhs; ehadhh;/ nguhrphpah; br.,uhjh fpU\;zd; (g.M.) Ky;iy epiyak;/ 9 ghujp efh; Kjy; bjU/ jpahfuha efh;/ brd;id-600017/ 2015.
2. jpUtu';ff; fyk;gfk;/ mHfpa kzthsjhrh; / tpj;Jthd; M/ ehuhaz ntYg;gps;is (ciu) Ky;iy epiyak;/ 43/ g[Jj;bjU/ kz;zo/ brd;id/ 1995.
3. fpj;njhpak;khs; mk;khid/ tPukhKdpth;/ mwpth;.nr.Re;juuhrd; (ciu) Ky;iy epiyak;/ 9 ghujp efh; Kjy; bjU/ jpahfuha efh;/ brd;id-600017/ 2015.
4. rPjf;fhjp jpUkz thH;j;J / vl;lag[uk; ckWfhj;jg; g[yth;/ nguhrphpah; K.,.mfkJ kiuf;fhah; (ciu)/ kiuf;fhah; gjpg;gfk;/ 3/ ul;yz;;l; nfl; ,uhz;lhk; bjU/ E';fk;ghf;fk;/ brd;id-600006/ 1996.

Recommended Books:

1. Thirukailaya Gnana Ula, Seraman Perumal Nayanar, Professor S.Radhakrishnan (P.A.), Mullai Nilayam, 9, Bharathi Nagar, First Street,

- Thiyagarayar Nagar, Chennai-600 017, 2015.
2. Thiruvavangala Kalambagam, Azhagiya Manavasadhasar, Viththuvan A. Narayana Velupillai (Urai), Mullai Nilayam, 43, Puthu Theru, Mannadi, Chennai, 1995.
 3. Kitheriyammal Ammanai, Veera Mamunivar, Arivar. S. Sundarasan (Urai).
 4. Seethakkathi Thirumana Vazhthu, Ettayapuram, Umarukathapulavar, Professor M.E. Ahamad Maraikkayar (Urai), Marakkayar Pathippagam, 3, Ratlant Gate, Second Street, Nungambakkam, Chennai-600006, 1996.

ghh;it E]y;fs;

1. rpw;wpyf;fpa Muha;r;rp / Kjy; bjhFjp / lhf;lh;.,uh.fz;zd;/ 2002.
2. rpw;wpyf;fpa tifa[k; tifika[k;/ lhf;lh;., fp.Mjpehuhazd;/ 2014.
3. jkpHpy; rpw;wpyf;fpa tuyhW/ lhf;lh;., K.bghd;Drhkp/ 2016.

Reference Books:

1. Sitrilakkiya Araichi, Muthal Thoguthi, Prof. R. Kannan, 2002.
2. Sitrilakkiya Vagaiyum, Vagaimaiyum, Prof.K. Adhinarayanan, 2014.
3. Thamizhil Sitrilakkiya Varalaru, Prof. M. Ponnusamy, 2016.

<http://www.tamilvu.org/ta/library-libcontnt-273141>

<https://amuthamthamizh.blogspot.com/2014/12/blog-post.html?m=1>

<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	rpw;wpyf;fpa tuyhW/ tiffs;/ ghLbghUs; KGtJkhf mwpjy;. Sitrlikkaya varalaaru, Vakaikalai, Paaduporul muzhuvathumaga aarithal.
CO2	:	cyh vDk; rpw;wpyf;fpa tifapy; mike;j E]ypUe;J ,iwtd; bgUikfis mwpe;J gf;jpp czh;ita[k; bgWjy;. Ulaa yenumsitrilakkiya vagaiyil aamaidha noolirunthu ilaivan perumaikalai arindhubakthi unaivaiyum peruthal.
CO3	:	fyk;gfk; vDk; tifg;ghl;oy; jpUtu';fg; bgUik mwpjy;/ ,iwa[zh;itg; g[hpy;. Kalambam eanum vakaipattil theruvavangala perumai arithal iraiyunaivai opurithal.

CO4	:	nkiyehl;Lg; ghjphpahuhd tPukhKdpth; E]y; _yk; fpwp!;Jt kjf; fUj;Jf;fisa[k; tpsf;f';fisa[k; bgWjy;. Melainaattu baathiriyaarana Veramaamunivar Nool Mollam chisthuva madha karuthukkalaikum Vilakkangaliyum peruthal.
CO5	:	ts;sy; rPjfhjp gz;g[fisa[k;/ bry;tr; brHpg;iga[k; mwpjy;. mf;fhy rKjha NHiy mwpjy;/ jpUkz thH;j;J vd;w rpw;wpyf;fpa tifiaa[k; gaida[k; mwpjy;. Vallal sethakaathi panpukalai, Selva sezhipaiyum arithal aakkala samudhaya soozhalai arithal, Thirumna vaazhithu yendra setrilakkiya vakaiyaiyum payanaiyum aruthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	2	2	3	2
CO3	3	2	2	2	2
CO4	3	3	3	3	3
CO5	3	2	2	3	2
AVERAGE	3	2.4	2.4	2.8	2.4

bjhy;fhg;gpak; - bghUsjpfhuk; - I

Tholkappiyam – Porulathigaram - I

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

16. gH';fhy kf;fspd; mf xGfyhWfis mwpar; bra;jy;.
17. gH';fhy kf;fspd; g[w xGfyhWfis vLj;Jiuj;jy;.
18. jpUkzj;jpw;F Kd;Ds;s fst[thH';f;ifapd; ,yf;fzf; TWfis tpsf;fpf; TWjy;.
19. jpUkzj;jpw;Fg; gpe;ija fw;g[thH';f;ifapd; ,yf;fzf; TWfis tpsff;fpf; TWjy;.
20. fhjy; thH;tpy; mika[k; kugpay; kw;Wk; ghly;fspy; ,lk;bgWk; cs;Siw Mfpatw;iw vLj;Jf;Twy;.

Course Objectives :

16. Pazhangala makkalin aga ozhukalarukalai ariya seuithal.
17. Pazhangala makkalin pura ozhungalarukalai eaduthuraithal.
18. Thirumanathirku munnulla kalavu vazhikaiyin ilakkanak koorukalai villaki kooruthal.
19. Thirumanathirku pindhaya karppu vazhikaiyin ilakkana koorukalai villakki kooruthal.
20. Kadhal vaazivil amaiyum marapiyal mattrum padalkalin idamperum ullurai aagiyavatrai eduthuraithal.

myF -1 :

mfj;jpizapay;

Alagu : 1

Agathinaigal

myF -2 :

g[wj;jpizapay;

Alagu : 2

Purathinaigal

myF -3 :

fstpay;

Alagu : 3

Kalaviyal

myF - 4:

fw;gpay;

Alagu : 4

Karpiyal

myF - 5:

bghUspay;

Alagu : 5

Poruliyal

ghpe;Jiu E]y;:

1. bjhy;fhg;gpak; - bghUsjpfhuk;/ bjhy;fhg;gpah;/ jpUbey;ntyp bjd;dpe;jpa
irtrpj;jhe;j E]w;gjpg;g[f; fHfk;/ brd;id-18.
2. bjhy;fhg;gpak; - bghUsjpfhuk;/ jpU"hdrk;ge;jh; ciu/ fjph; gjpg;gfk;/ 93/
bjw;F tPjp/ jpUitahW-613 204.

Recommended Books:

1. Tholkaapiyam –Poruladhigaram,Tholkapiyar,Thirunelveli Thenindhiya
Saivasidhandha Noorpadhipu kazhagam, Chennai-18.
2. Tholkaapiyam –Poruladhigaram, Thirugnanasambandarr Urai, Kathir
Pathippagam, 93, Therku Veethi, Thiruvaiyaru – 613204.

ghh;it E]y;fs;

1. bjhy;fhg;gpak; - bghUsjpfhuk;/ K.rz;Kfk;gps;is (g.M).
2. bjhy;fhg;gpak; - bg
3. hUsjpfhuk;/ r.nt.Rg;gpukzpak; (g.M).
4. bjhy;fhg;gpak; - bghUsjpfhuk;/ F.Re;ju_h;j;jp (g.M).
5. mw;iw ehs; fhjYk; tPuKk; - lhf;lh;.f.g.mwthzd;.
6. bjhy;fhg;gpa bewp - K.m.Jiu mu';fdhh;.

Reference Books:

1. Tholkaapiyam –Poruladhigaram,M.Shanmugapillai(P.A)
2. Tholkaapiyam –Poruladhigaram, S.V Subramaniam (P.A)

3. Tholkaapiyam –Poruladhigaram , K.Sundaramoorthy(P.A)
4. Atrai Naal Kaadhalum Veeramum – Dr.S.P Aravaanan
5. Tholkaapiyam Neri – M.A. Thurai Aranganar

<https://www.youtube.com/watch?v=96X70PNVmjg>
<https://www.youtube.com/watch?v=EYNSksJLUh8>
<https://www.youtube.com/watch?v=0YGNmnuP1J4>
<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	cyf kf;fs thH;th';F thH tFf;fg;gl;l fst[[/ fw;g[Mfpa mf xGf;f';fis mwpe;J nghw;Wjy;. Ulaga makkal vazhivirkku vazha vagukkapatta kalavu, karpu aagiya aga ozhukkangalai arindhu pootruthal.
CO2	:	jdp kdpjdpd; fy;tp/ <if/ g[[fH;/ tPuk; nghd;w thH;tpaiyg; nghw;wpg; gpwhplk; gfph;e;J bfhs;sy;. Thani manithan kalvi, eegai, pughaz, veeram poondra vaazhviyalai pootri piraridam kollal'
CO3	:	,y;yw thH;tpaYf;F moj;jskhf (my;yJ) thapyhf mika[k; fst[thH;tpd; nkd;fis czh;j;Jjy;. Illara vazhviyaluku adithalamaga (alladhu)vaailaga amaiyum kalavu vaazhivin mengalai unarthuthal.
CO4	:	jppUkzj;jpw;Fg; gpd; rhd;nwhhplk; xGFk; xGf;fj;ij tps';fpf; bfhz;L mt;bthGf;f';fisg; gpd;gw;Wjy;. Thirumanathirku pin sandorridam ozhugum ozhukkathai villakki kondu avozhkangalai pinparuthal.
CO5	:	mfk;/ g[wg; bghUs;fspd; v";rpatw;iw ghly;fnshL bghUj;jpg; ghh;j;jy;. Agam, pura porulgalin eanjiyavatrai padalgaloadu poorunthi paarthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3

CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	2	3	3
CO5	2	3	3	2	3
AVERAGE	2.8	3	2.8	2.8	3

tpUg;gg; ghLk; - 1: nfhapw; fiya[k; gz;ghLk; Ml;rpa[k;

tpUg;gg; ghLk; - I

Kovil Kalaiyum Panpadum Atchiyum

Total Hours : Course Code :
Credits : L.T.P. :

nehf;fk; :

21. jkpHhpd; rka';fshd irtk;/ itztk; gw;wpa bfhs;;iffSk; tHpgLk; Kiwa[k; vLj;Jf;fhl;Lk; nfhappy; fiya mwpa itj;jy;.
22. gH';fhy nfhapw; fl;olf; fiyfis tpsf;Fjy;. ,j;jifa nfhapy; gw;wpa tptu';fis vLj;Jiuj;jy;.
23. rka';fs; nfhapy; tHp elj;Jk; jpUtpHh Kjyhd rKjhar; rl';Ffis tpsf;Fjy;.
24. kf;fspd; thH;tpy; rkak; jUk; gad;fis bray;ghLfshf nfhapy;fSk;/ mij tHp elj;Jk; mwf;fl;lifSnk jpwk; bra;J tUtij tpsf;Fjy;.
25. nfhapy;fs; _yk; rpw;gf;fiy tsh;jy;/ nkYk; gy;ntW bja;t tHpghLfs; tsh;jiy tpsf;Fjy;.

Course Objectives :

21. Tamizharin samayangalana saivam, vaunavam patrriya kolgaikalum vazhipadum muraiyum yeduthukkattum koil kalaiyai ariya vaithal.
22. Pazhangala koyir kattitdak kalakagalai vilakkuthal. Idhakaya koyil patrriya vivarangalai yeduthuraithal.
23. Samayangal koyil vazhi nadathum thiruvizha mudhalana samudhayach sadangugalai vilakkuthal.
24. Makkalin vaazhivil samayam tharyum payangalkali seyalpadukalaga koyilagalum ,adhai vazhi nadathum arakkattalaikgalum thram seithu varuvathai vilakkuthal.
25. Koyilgal moolam sirppakalai valarthai,melum palveru dheiva vazhipaadukal valarthalai vilakuthal.

myF - 1

nfhapy; - brhy; tpsf;fk; - gz;il ,yf;fpa';fspy; / nfhapy;/ brhy;/ ,lk; bgw;wik - nfhapw; fiyapd; njhw;wk; - tsh;r;rp - Tl;lf; fiyapd; tsh;r;rp.

Alagu -1:

Koil-Sol Vilakam –Pandai Illakiyangal, Koil, Sol, Idam, Petramai- Koil Kalaiyin Thotram – Valarchi –Koota kalaiyin Valarchi.

myF -2 :

nru nrhHg; ghz;oah;fspd; nfhapy; mikg;g[fs; - gpw;fhyr; nrhHh; nfhapw; fiy - gpw;fhyg; ghz;oah; nfhapy; fiy - tpraefug; nguuR fhyf; nfhapy;fs; - ,f;fhyf; nfhapw;fiy.

Alagu - 2

So Sozha Pandiyargalin Koil Amaipugal- Pirkaala Sozhar Koil kalai- Pirkaala Pandiyar Koil Kalai – Visayanagara Porsue kaala koyilgal –Ikkala koilkalai

myF -3 :

nfhapiy xl;o te;j bja;tPfg; gz;ghl;od; bghJf;TWfs; r_fg; bghJ tHpghl;od; rpwg;g[- ,ir - eldk; - Xtpak;; - rpw;gk; Kjypa fiyfspd; tsh;r;rp/ jyg[uhz';fs; - ,tw;why; mwpag;gLk; ehfhpfk; - gz;ghL.

Alagu - 3

Koyilai Oti vandha theiviga panpatin podhukoorugal samuga podhu vazhipatin sirapu –isai- Nadanam –Oviyam- Sirpam Mudhaliya Kalaigalin Valarchi Thalapurangal –Ivatral Ariyapadum Nagarigam –Panpaadu.

myF - 4:

jpUtpHhf;fs; mtw;wpw;Fhpa mwf;fl;lifsf; - tHpghl;Lf;Fhpa tpjp Kiwfs; - kd;dh;fSk; kf;fSk; mspj;j mwf;fl;lifsf; - mtw;iw nkw;ghh;itapLk; Kiwfs; - nfhapiyr; rhh;e;j epy';fSk; bghUs;fSk; - mYtyh;fs; - Cjpak;/ ,iwapyp epy';fs; mspj;jik.

Alagu -4

Thiruvizhakal Avatrikuriya Arakatalaigal –Vazhipatirkuriya Vidhimuraigal – Manargalum Makkalum Alitha Arakatalaigal –Avatrai Merparvaiyidum Muraigal- Koyilai Saarntha Nilangalum Porutkalum-Aluvalargal-Oothiyam,Iraiylili Nilayangal Alithamai

myF - 5:

bghJ eph;thfk; - kd;dh;fs; eph;thfk; - Ch; eph;thfk; - rpiyfs; - cnyhfr; rpiyfs; - gpw rpiyfs; - ghJfhj;jy; - g{ridg; bghUl;fs; - mtw;iwg; ghJfhj;jy; - bgUe;bja;tk; - rpWbja;tk; tHpghl;oy; ntWghL.

Alagu -5

Podhu Nirvagam-Manargal Nirvagam – Oor Nirvagam- Silaigal –Ologa Silaigal –Pira silaigal –Padhukathal –Poosanai Porutkal –Avatrai Padhukathal –Perundheivam – Sirudheivam Vazhipatil Verupaadu.

ghpe;Jiu E]y;:

1. nfhapw;fiya[k; rpw;g';fSk;/ gp.Mh;.rPdpthrd; jkpHhf;fk;/ vl;.r';fud;/ fiy"d; gjpg;gfk;.
2. jkpHff; nfhapw;fiyfs;/ ehfrhkp/ jkpH;ehL muR bjhy;bghUs; Ma;t[j;Jiw/ brd;id.

3. rpw;gKk; fiy thH;t[k;/ n#.vk;.nrhkRe;juk;/ fHf btspaPL/ brd;id.
4. jkpHf tuyhWk; gz;ghLk;/ nf.nf.gps;is/ jkpH;ehl;Lg; ghIE]y;/ brd;id.
5. kfhygypg[u;j;pd; rkzr; rpw;g';fs;/ kapiy.rPdp.nt';flrhkp/ jkpH;ehL/ i#dr';fk;.

Reference Books:

1. Koyilkalaiyum Sirpangalum, P.R Srinivasan Tamizhakam,S.Sangaan, kalaigan Padhipagam.
2. Thamizhaga Koyilkalaigal, Nagasamy, Tamilnadu Arasu zthozhporul Ayvuthurai,Chennai.
3. Sirpamum Kalai Vazhvum, A.M Somasundaram, Kazhaga veliyeedu, Chennai.
4. Thamizhaga Varalarum Panpadum, K.K Pillai, Thamizhnatu paadanool, Chennai.
5. Mahabalipurathin Samana Sirpangal, Mayilai Seenivengadasaamy, Tamilnadu, Hainasangam.

https://www.youtube.com/watch?v=JCA4o6T6_5Q
<https://www.youtube.com/watch?v=-4AbmdTwjng>
<https://www.youtube.com/watch?v=xVYfGo083mY>
<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	nfhapy; vDk; brhy;ypd; tpsf;fk;/ nfhapy; fiya[k;/ fl;olf; fiya[k; fhye;njhWk; rpwg;ghf tsh;e;J te;jikia mwpjy;. Koyil yenum soolin vilakkam,koyil kalaiyum,kattidak kalaiyum kaalanthorum serappaga valarndhu vandhamaiyai arithal.
CO2	:	tuyhw;W bra;jpfshf nru/ nrhH/ ghz;oah;fspd; nfhapy;fspd; jdpj;jd;ik/ milahs';fshf mwpe;Jf; bfhs;Sjy;. Varalaatru seithigalaga sera,sozha,paandiyargalain koyilagalin thaniththanmai,adaiyaalaangalaga arindhu kooluthal.
CO3	:	bja;tPfk; gw;wpa gz;ghL/ tHpg;ghL/ fyhr;rhuk;/ fiyfs; njhw;wk; tsh;r;rp _yk; gH';fhy ehfhPfk; gz;ghl;il mwpjy;. Dheiveegam pattriya panppadu, vazhippadu, kalaachcharam, kalaikal dhottram valarchi moolam pazhangala naagarraigam panppattai arithal.
CO4	:	mwf;fl;lisfs; vt;thW rKjhag; gad; jUk;. rka jpUtpHhf;fs; kw;iwa bray;ghLfs; _yk; rKjhaj;jpw;F gad; jUjiy mwpjy;. Arakkattalaigal evvaru samudhayamp payan tharum samaya thiruvizhakkal mattraya seyalpaadukal moolam samudhaythirku payan tharutthalai arithal.

CO5	:	muR eph;thfk; vt;thW bray;gLfpd;wnjh mJnghy nfhapy; eph;thfKk; kf;fs; thH;it eph;tfgp;gJk;/ nfhapy; brhj;Jf;fis ghJfhj;J tUjiya[k; mwpjy;. Arasu Nirvaagam Evvaaru seyalpaduginrato Atupola Koyil Nirvaagamum Makkal Vaazhvai Nirvagippatum, Kovil Sottukkalai Paatukaatu Varutalaiyum Arithal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	2	2	2	2	2
CO3	3	2	2	3	2
CO4	3	3	3	3	3
CO5	3	2	3	2	2
AVERAGE	2.8	2.4	2.6	2.6	2.4

jhs:: 5 : rpj;jh; ,yf;fpak;
Paper:5 : Siththar Ilakkiyam

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

26. rpj;jh;fs;/ rpj;j kUj;Jtk; gw;wpa mwptpidg; ngustpy; bgUf;f ntz;Lk;.
27. Mjp rpj;jh; mfj;jpah; kw;Wk; thH;f;ifapd; _yhjuj;ij vLj;Jf;fhl;Lk; jpU_yh; Mfpnahh; TWk; cly;eyk; ngQk; fUj;Jf;fis mwpjy; ntz;Lk;.
28. ghk;ghl;or; rpj;jh; fhl;Lk; thH;tpd; epiyahik/ thH;it epiyf;fr; bra;a nkw;bfhs;s ntz;oa bewpfisj; bjhpe;J bfhs;Sjy;.
29. gl;odj;jhh; ghly;fs; tHpj; jk; thH;it brk;ikahf;fpf; bfhs;s ntz;Lk;.
30. ,iwtdJ jpUtofis/ jpUtUl;lh tHpepd;W "hdkhh;f;fj;jpy; vspjpy; mila[k; tHpia mwpjy; ntz;Lk;.

Course Objectives :

26. Siththarkal , sitha maruthuva patriya arivinaip peralavil perukka vendum.
27. Aadhi sithar agathiyar matrum vazhkkaiyin moolatharathai eaduthukkattum thirumoolar aagiyor koorum udalnalalam peenum karuthukalai aarithal vendum.
28. Paampaatin sithar kaattum vaazhivin nilayaamai, vazhivai nilaikka seiyya merkollga vendiya nerikalai therindhu kolluthal.
29. Pattinathanaar paadalkal vazhi dham vaazhvai semaiyaaki kola vendum.
30. Iravanathu theirukalai, theruvaruttpa vazhinindru ganamaarkkaththil yelithl adaiyum vazhiyai arithal vendum.

myF -1 :

rpj;jh; nfhl;ghL : rpj;jh; - bgah;f;fhuzk; - rpj;jh; fhyk; - ,iwbewp - nahfrhjid - Md;k rf;jp - rpj;j rf;jp - rpj;jh; kugpy; nts;tpfs; - je;jpuk; - rhpia fphpia khh;f;fk; - rpj;jh;fspd; tpidf;bfhs;if - rpj;j kUj;Jtk;.

Alagu : 1

Sithar kootpadu : siththar – peyarkaranam – siththar kaalam – iraineri-yogasathanai – aanma sakthi – sithi sakthi - sithar marapil velvigaal – thanthiram – sariyai giriyaai maarkkam – sitharkalin vinaikkollakai – sitha maruthuvam.

myF - 2:

mfj;jpak; - thjf; fhz;lk; (1-48 ghly;fs;).

jpU_yh; - fharpj;jp cghak;.

Alagu : 2

Agathiyum – vaadhak kaandam (1-48 padalkal).

Thirumoolar – kaayasithi ubayam.

myF - 3:

ghk;ghl;or; rpj;jh; (50 ghly;fs;) (40-49/ 50/ 53/ 56-76/ 77/ 79/ 89/ 90/ 92/ 94/ 95/ 96/ 98/ 100/ 101/ 103/ 105/ 106/ 107/ 108/ 110).

Alagu : 3

Paampatti sithr (50 padalgal) (40-49/ 50/ 53/ 56-76/ 77/ 79/ 89/ 90/ 92/ 94/ 95/ 96/ 98/ 100/ 101/ 103/ 105/ 106/ 107/ 108/ 110).

myF - 4:

gl;odj;jhh; ghly;fs; (50 ghly;fs;) (50-63/ 65/ 67-82/ 84-98/ 100-104).

Alagu : 4

Pattinaththar padalgal (50 padalgal) (50-63/ 65/ 67-82/ 84-98/ 100-104).

myF - 5:

jpUtUl;gh - Mwhk; jpUKiw

jj;Jtk;

1. Rj;j rd;khh;f;f ntz;Lnfhs;

2. "hd kUe;J

3. mgak; mgak;.

Alagu 5:

Theiruvarutppa – aaraam thirumurai

Thaththuvam

1. Sutha sanmaarkka vendukool

2. Gana marunthu

3. Abayam abayam.

ghpe;Jiu E]y;fs;

1. gd;dpUfhz;lk;-200/ mfj;jpah;/ (_yKk; ciua[k;) m.,uhftd; (ciu)/ r';fh; gjpg;gfk;/ Or;rh;!; fpy;L fhyzp/ ,uh#h#p efh; tphpt[/ tpy;ypthf;fk;/ brd;id.
2. rpj;jh; ghly;fs;/ j.nfhthpe;jd;/ g{k;g[fhh; gpuRuk;/ 15/ kd;dhh; rhkp nfthapy; bjU/ brd;id - 13/ khh;r;/ 1979.
3. jpUke;jpuk; (_d;W ghf';fs;)/ jpU_yh;/ #p.tujuh#d; (ciu)/ gHdpag;gh gpujh;!;/ brd;id-7/ 1985.

4. jpUtUl;gh/ Mwhk; jpUKiw/ jpUmUl; gpufhr ts;syhh;/ ,uhkyp';fh; gzpkd;wk;/ 31/ nghaR njhl;lk;/ brd;id-86/ 1972.
5. gl;odj;jhh; ghly;fs;/ tpUj;jpa[iu/ jpU.tp.f. Ky;iy epiyak;/ 9/ ghujpefh; Kjy; bjU/ jp.efh;./ brd;id-17/ ork;gh;/ 1998.

Recommended Books:

5. pannirukaandam -200, agathiyar, (moolamum uraiyum) A.Raghavan (urai), Sankar Pathippagam, Theachers kildu kaalani , rajaji nagar viruvu, Villivakkam, Chennai.
6. Sithar padalgal, T.Govindhan, poompukar pirasuram, 15, Mannar saami koyil Theru, Chennai -13, March, 1979.
7. Thirumandhiram (Moondru pagangal), thirumoolar, G.Vratharajan (urai), Pazhaniyapaa Brothers , Chennai 7,1985.
8. Thiruvavaruttpa, aaraam thirumurai, thiruvavaruttpa piragasa vallalaar, Ramalingar panimandram, 31 Poyasu thottam, Chennai-86,1972.
9. Pattinathar padalgal, virunthinaurai, thiru.V.K Mullai nilayam, 9,barathinagar mudhal Theru, T.Nagar., Chennai -17, Desambar,1998.

ghh;it E]y;fs;

4. jpU_yhpd; jpUke;jpu tpUe;J/ jpUrK;ge;jk;.
5. epiwe;J thGk; rpj;jh;fs;/ jtnahfp "hdnjtghujp Rthkpfs;
6. gjpbdl;L rpj;jh;fspd; thH;t[k;/ thf;Fk;/ \$njtehj !;thkpfs;.

Referencse Books:

4. Therumoolarin Therumandhira Virundhu, Therusampantham.
5. Niraindhu vaazhum sitharkal, Thavayogi ganadevabaarthi swamigal.
6. Pathinetu siththsergalin vaazvum, Vaakkum, Sridevanaatha swamigal.

<https://www.scribd.com/document/358168287/Tamil-Siddhar-Books-%E0%AE%9A%E0%AE%BF%E0%AE%A4-%E0%AE%A4%E0%AE%B0-%E0%AE%A8%E0%AF%82%E0%AE%B2-%E0%AE%95%E0%AE%B3-53-Books>

<https://www.youtube.com/watch?v=jLrx14VkGLA>

<https://www.youtube.com/watch?v=l7HPI2WuEwA>
<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	rpj;jh; kUj;Jtk; gw;wp mwpe;J bfhs;tjhy; cly; gpzpia ePf;f KofpwJ. Sithar maruthuvam patrri arindhu kollavadhal udal piniyai neekka mudikirathu.

CO2	:	mfj;jpahpd; thjfhz;;lk;/ jpU_yhpd; fharpj;jp cghak; Mfpatw;iwf; fw;wjhy; clk;ig nehapdpd;W fhj;Jf; bfhs;s KofpwJ. Agaththiyarin vaathakaandam, Thirumoolarin gayathsithi ubayam aagiyavatrai katrrathal udambai nooyindri kaathu kola mudikirathu.
CO3	:	thH;tpd; epiyahikia czh;tjd; _yk;/ thH;it epiyj;J epw;fr; bra;a ghk;ghl;or; rpj;jhpd; ghlw;fUj;Jf;fs; cjt[fpd;wd. Vaazvin nilayaamaiyai unarvadhn moolam, vaazvai nilaithu nirkka seiya paampatin sitharin paadakkaruthukal udhavukinrana.
CO4	:	gl;odj;jhdpd; ghly;fs;/ khakhd cyff; bfhs;iffis czh;e;J/ "hdbewpapy; bry;y tHpfhL;Lfpd;wd. Pattinatharin Padalgal, Mayaamana ulaga kollakagal unandhu, Gananeriyil sella vazhikaatukinrana.
CO5	:	jpUtUl;gh- jpU+mUs;+gh/ ,iwtdJ jpUtUisg; bgw;why; mtdJ jpUtofisr; Rj;j rd;khh;f;f bewpapy; brd;wila bewpfhl;LfpwJ. Thiruvarutppa- Thiru+arul+pa, Iraivanathu Thuruvarulai pettraal avandhu theruvadikalai sutha sanmaarkka neril sendradaya nerikaattuthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2
CO2	2	3	2	2	2
CO3	2	2	3	2	2
CO4	2	2	2	3	2
CO5	3	3	3	2	3
AVERAGE	2.4	2.6	2.4	2.2	2.2

jhs;; 6 : gf;jp ,yf;fpak;
Paper 9 : Bakthi Ilakkiyam

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

31. midj;;J rka';fspd; gf;jp bewpawpjy;.
32. _th; Kjypfs;/ KjyhH;thh;fs; nghd;w irt/ itzt moahh;fis mwpKfk; bra;jy;.
33. ,ilf;fhyj;J moahh;fspd; gf;jpr; rpwg;ig vLj;Jf; fhl;ly;.
34. ,yf;fpa tsh;r;rpapy; rka';fspd; g';F ahJ vd tpsf;Fjy;.
35. rka ,yf;fpa';fspd; cj;jpfs;/ bra;a[s; tot';fs; nghd;wd mwpjy;.

Course Objectives :

31. Anaithu samayangalin bakthi neriyarithal.
32. Moovar mudhaligal, mudhalazhvargal pondra saiva, vainava adiyalargalai arimugam seithal.
33. Idaikalathu adiyargalin bakthi sirappai eduthukattal.
34. Ilakkiya valarchiyil samayangalin pangu yathu ena vilakkuthal.
35. Samaya ilakkiyangalin uthigal, seyyul vadivangal pondrana.

myF -1 :

gf;jp bewp - bghJg;ghh;it - irtk; - itztk; tpsf;fk; - rkag; bghpath;fs; - irt/itzt jUk';fs; - rpj;jhe;jk; - ntjhe;jk; - tpsf;fk;.

Alagu – 1

Bakti Neari – Potupaarvai – Seivam –Vainavam Vilakkam – Samaya periyavargal – Seiva – Vainava Tarmangal – Sithantham – Vethandam – Vilakkam.

myF -2 :

1. jpUf;Flthapy; 1 Kjy; 11 ghly;fs;
2. jpUpilkUJ]h; 1 Kjy; 11 ghly;fs; - jpU"hdrk;ge;jh;
3. jpUkz";nrhp 1 Kjy; 10 ghly;fs;
4. jpUnrhw;Wj;Jiw 1 Kjy; 10 ghly;fs; - jpUeht[f;furh;
5. jpUf;flt{h; tPul;lk; - jpUf;fhsj;jp 1 Kjy; 10 ghly;fs; - Re;juh;.

Alagu – 2

1. Tirukudavaiyil 1 muthal 11 Paadalgal
2. Tiruvedaimaruthur 1 muthal 11 Paadalgal – Tiru Gnanasambanthar
3. Tirumanjeri 1 muthal 10 Paadalgal
4. Tirusotruturai 1 muthal 10 Paadalgal – Tirunaavukarasar
5. Tirukkadavur Veerattam – Tirukaalatti 1 muthal 10 Paadalgal – Sundharar.

myF -3 :

1. bgha;ifahH;thh; - ,aw;gh - 1 Kjy; 20 ghly;fs;
2. g{jj;jhH;thh; - ,aw;gh - 1 Kjy; 20 ghly;fs;
3. ngahH;thh; - ,aw;gh - 1 Kjy; 20 ghly;fs;

Alagu – 3

1. Poigaiyazhvaar – Iyarpaa – 1 muthal 20 Paadalgal
2. Puuthathazhvar – Iyarpaa – 1 muthal 20 Paadalgal
3. Peiyazhvaar – Iyarpaa -1 muthal 20 Paadalgal.

myF - 4:

1. jpUr;rjfk; 1 Kjy; 10 ghly;fs; (6 - mEnghfr; Rj;jp)
2. jpUj;jrh';fk; 1 Kjy; 10 ghly;fs; (moik bfhz;l Kiwik)
3. jpUbtz;gh 1 Kjy; 10 ghly;fs; (mize;njhh; jd;ik)
4. jpUtha;bkhHp 1 Kjy; 30 ghly;fs; (5-k; gj;J)

Alagu – 4

1. Tirusatagam 1 muthal 10 Paadalgal (Anu poga suttu)
2. Tirutthasaangam 1 muthal 10 Paadalgal (Adimai konda Muraimai)
3. Tiruvenba 1 muthal 10 Paadalgal (Anaintor Tanmai)
4. Tiruvaimozhi 1 muthal 30 Paadalgal (5 Aam Pathu)

myF - 5:

1. jpUg;ghit - KGtJk;
2. jpUthy';fhl;L _j;j jpUg;gjpfk; - 12Mk; jpUg;gjpfk;/ 1 Kjy; 10 ghly;fs;
3. jpU,ul;il kzpkhiy 1 Kjy; 20 ghly;fs;

Alagu – 5

1. Tirupaavai – Muzhuvathum
2. Tiruvalangaatu Mutta Pathipagam – 12 Aam Tirupatipagam, 1 muthal 10 Paadalgal
3. Tiru Erattai Manimaalai 1 muthal 20 Paadalgal

ghpe;Jiu E]y;fs;:

1. njthuk;/ jpU"hdrk;ge;jh; Rthkpfs;/ g[yth;.gp.uh.eluhrd; (ciu). ckhgjpg;gfk;/ et. 2004 (Kjw;gjpg;g[])
2. njthuk;/ jpUeht[f;fuR Rthkpfs;/ g[yth;.gp.uh.elurhd; (ciu)/ ckhgjpg;gfk;/ #Piy/ 2007 (,uz;lhk; gjpg;g[])
3. njthuk;/ Re;ju_h;j;jpRthkpfs;/ g[yth;.gp.uh.elurhd; (ciu)/ ckhgjpg;gfk;/ Vg;uy; 2008/ (_d;whk; gjpg;g[])
4. jpUg;ghit/ Mz;lhs;/ o.v!;. uh#nfhghyd; (ciu) MH;thh;fs; mKj epiyak;/ khh;r;R/ 1995 (,uz;lhk; gjpg;g[])
5. jpUthrfk;/ khzpf;fthrfh;/ jpU.g.,uhkehjgps;is (ciu)/ fHf btspaPL/ mf;. 1963 (Kjw;gjpg;g[]).
6. jpUtha;bkhHp (ciu)/ ,uz;lhk; gFjp)/ Kidth;. kjp.\$epthrd; (ciu) MH;thh;fs; mKjepiyak;/ khh;r;R/ 1994 (,uz;lhk; gjpg;g[]).
7. gjpbduhe; jpUKiw/ g[yth;. gp.uh.eluhrd; (ciu)/ ckhgjpg;gfk;/ Mf!;l; 2005 (Kjw;gjpg;g[]).
8. KjyhH;thh; _th; - ,aw;gh/ o.v!;. uh#nfhghyd; (ciu) MH;thh;fs; mKj epiyak;/ khh;r;R/ 1995 (,uz;lhk; gjpg;g[])

Recommended Book

1. Teavaaram, Tirugnana Sambanthar Swamigal, Pulavar B.R. Nadarasan (Vurai) Uma Pathippagam, Nov 2004 (Muthal Patippu)
2. Devaaram, Tirunaavukarasu Swamegal, Pulavar B. R. Nadarasan (Vurai), Uma Patipagam, July – 2007 (Irandam Patipagam)
3. Devaaram, Sundara Moorthy Swamigal, Pulavar B.R. Nadaraasan (Vurai) Uma Patipagam, April 2008 (mundram Patipagam)
4. Tirupaavai, Andaal, D.S. Raajagopaalan (vurai) Aazhvaargal Amuta Nilayam, March, 1994, (Irandam Patippu)
5. Tiruvaasagam, Maanikka Vaasagar,Tiru P. Ramanaata Pillai, (Vurai) Kazhga Veliyeedu, Oct 1963. (Muthal Patippu)
6. TiruvaiMozhi (Vurai), (Irandam pakuti), Munaivar. Mati Sreenevaasan (Vurai)Aazhvaargal Amuta Nilayam, March, 1994 (Irandam Patippu).
7. Patinorantirumutai, Pulavar. P.R. Nadaraajan (Vurai), Uma Patippagam, Aug.2005 (Muthal Ptippu).
8. Muthalaazhvar Muvar – Iyarppa, D.S. Raaja Gopaalan (Vurai) Aazhvaargal Amuta Nilayam, MARCH, 1995 (Erandaam Patippu).

ghh;it E]y;fs;

1. gf;jp ,yf;fpak; - mUzhryk;/ fHf btspaPL/ brd;id.
2. irtKk; jkpGk; - jpU. Gukrptk;.
3. rkak; tsh;j;j jkpH; (Ma;t[f;fl;Liufs;).
4. jpUj;bjh;lh; bjhiff - ek;gpahz;llhh; ek;gp fHf btspaPL.
5. \$ itztk; - MH;thh;fs; mKj epiyak; btspaPL/ brd;id-2.

Reference Books

- 10.Bakthi Elakkiyam – Arunaachalam, Kazhaga Veliyeedu, Chennai.
- 11.Seivamum Tamizhum – Tiru. Parama Sivam.
- 12.Samayam Valartha Tamizh (Aaivu Katturaigal).
- 13.Tirutondar Tokai – Nambiyaandar Nambi Gazhka Veliyeedu.
- 14.Sree Vainavam – Aazhvaargal Amuta Nilayam Veliyeedu, Chennai – 2.

<http://kichamama.blogspot.com/2012/01/blog-post.html?m=1>

https://ta.m.wikipedia.org/wiki/%E0%AE%AA%E0%AE%95%E0%AF%8D%E0%AE%A4%E0%AE%BF_%E0%AE%87%E0%AE%B2%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AE%BF%E0%AE%AF%E0%AE%AE%E0%AF%8D

<https://youtu.be/Wb6zEVvOiX4>

<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	gf;jp bewp kuigg; g[hpe;J bfhs;Sjy;. Bakthi neri marabai purinthu kolluthal.
CO2	:	kj ey;ypzf;fj;njhL ,iwaDgtk; bgWjy;. Madha nallinanakkathodu iraiyanubavam peruthal.
CO3	:	fhy khw;w';fnshL gf;jp bewpiaf; fw;Wf; bfhs;Sjy;. Kalamatrangalodu bakthi neriyai katrukolluthal.
CO4	:	moahh;fspd; thH;tpay; tpHkpa';fnshL Toa gf;jp bewpiag; g[hpe;J bfhs;Sjy;. Adiyargalin vazhviyal vizhamiyangalodu koodiya bakthi neriyai purinthu kolluthal.
CO5	:	g[jpa ,yf;fpa tifikfis nfhit/ cyh/ nfhj;Jk;gp/ rjfk; nghd;wdtw;iwj; bjhpe;J bfhs;Sjy;. Puthiya ilakkiya vagamaigalai kovai, ula, kotthumbi, sadagam pondavatrai therinthu kolluthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	2	3	2	2	2
CO3	2	2	3	2	2
CO4	3	3	3	3	3
CO5	2	2	2	2	3
AVERAGE	2.4	2.6	2.6	2.4	2.6

**jhs;: 7 : fhg;gpa';fs;
Paper:7 : Kappiyangal**

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

36. bgU';fhg;gpa/ rpW';fhg;gpa ,yf;fzk; mwpjy;.
37. nkiyehl;Lf; fhg;gpa';fSk; bfhs;iffSk;; mwpe;J bfhs;Sjy;.
38. bgU';fhg;gpak;/ rpWfhg;gpak;/ g[uhzk;/ ,jpfhrk; Mfpatw;iwf; fw;wy;;.
39. gpw;fhy kw;Wk; gpwrkaf;; fhg;gpa';fisf; fw;wy;.
40. ,yf;fpa tsh;r;rpapy; fhg;gpa fl;likg;ig fw;wy;.

Course Objectives :

36. Parukkappiyam , Sirukkappiyam ilakkanam arithal .
37. Malainaddi kappiyakkalum kolgaiyum arithal kolluthal .
38. Purukkappiyam , Cirukkappiyam , Puranam , Thikasam akiyavattri kattral .
39. Birkala matram birasamaya kappiyakkalai kattral .
40. Ilakkiya valarsiyal kappiya kaddamaipai kattral .

myF -1 :

1. fhg;gpa tpsf;fk; - fhg;gpaj;jpd; tiffs; - bgU';fhg;gpa/ rpWfhg;gpa ,yf;fzk;-nkiy ehl;oy; fhg;gpa';fSk; bfhs;iffSk; - tlbkhHp/ jkpH;bkhHp; fhg;gpa';fspd; ntWghLfs; - fhg;gpa khe;jh; gw;wpaf; bfhs;iffs;.
2. rpyg;gjpfhuk;; t";rpf;fhz;lk; (KGtJk;).

Alagu –1

1. Kappiya vilakkam – kappiyatthin vagaikal – Perukkappiya , Sirukkappiya ilakkanam – Medai natil kappiyakkalum kollaiyum – vadamozhi , Tamizhmozhi kappiyakkalin veruppadukal – kappiya maththar patrtriya kolgaikal .
2. Silappathikkaram : Vagsikkaddam (muluvathum) .

myF - 2:

1. tisahgjp - KGtJk;
2. ehfFkhu fhtpak; - g";rpk neh;g[rUf;fk; (KGtJk;).

Alagu –2

1. Valaiyapathi – muluvathum .
2. Nakakumara kaviyam – Panjapi nonbu sarukam (muluvathum)

myF - 3:

1. bghpa g[uhzk; (Kjy; bjhFjp) - rz;nIRu ehadhh; g[uhzk; (KGtJk;).
2. fk;guhkhazk; (a[j;j fhz;lk;) - ,e;jpurpj;J tijg; glyk; (1-55 ghly;fs;)

Alagu – 3

1. Periya puranam (muthal thokuthi) – sandasura puranam (muluvathum) .
2. Kamparamanam (uttha kandam) – inthirasiththu vathai padalam (1-55 paadalkal)

myF - 4:

,ul;rzpa ahj;jphpfk; - ,ul;rzpa rhpjg; glyk; - Fkhug; gUtk; (1-100 ghly;fs;)

Alagu – 4

Ratchaniya yaathirigam – Ratchniya saridhap padalam – Kumaarap paruvam (1-100 paadagal)

myF - 5:

rPwhg;g[uhzk; (Kjy; bjhFjp)- kjpia miHg;gpj;j glyk; (85-108 ghly;fs;)

Alagu – 5

Seerappuraanam (mudhal thogudhi) – Mathiyai azhaippitha padalam (85 – 108 paadagal)

ghpe;Jiu E];

1. rpyg;gjpfhuk;/,s';nfhtofs;/ 1985/ gj;jhk; gjpg;g[/ jkpH;g; gy;fiyf;fHfk;/ j";rht{h;.
2. tisahgjp/ tp. re;jhdk; (ciuahrphpah;)/ 1995/ Kjy; gjpg;g[/ ee;jdhh; gjpg;gfk;/ rpjk;guk;.
3. ehf Fkhu fhtpak;/ tp. re;jhdk; (ciuahrphpah;)/ 1994/ Kjy; gjpg;g[/ ee;jdhh; gjpg;gfk;/ rpjk;guk;
4. nrf;fpHhh;/ 1970/ bghpa g[uhzk;/ Kjy; gjpg;g[/ \$fhrp klk;/ jpUg;gde;jhs;.
5. fk;gh;/ 1964/ fk;guhkhazk;/ VHhk; gjpg;g[/ it._. nfhghyfpU\;zkhrrhhpahh; fk;bgdp/ brd;id.
6. ,ul;rzpa ahj;jphpfk;/ vr;.V. fpU\;zg;gps;is/ 1998/ Kjy; gjpg;g[/ fpwpj;Jt ,yf;fpa r';fk;/ brd;id.
7. rPwhg;g[uhzk;/ ckWg;g[yth;/ 1999/ Kjy; gjpg;g[/ ftpnahfp ehr;rp;Fyj;jhh;/ jpUth%h; khtl;lk;.

Recommended Book

1. Silappadhigaaram , Ilangovadigal, 1985,Pathaam padhippu, Thamizhpalagalaikkazhagam, Thanjavur.

2. Valayabathi, V. Sandhaanam (Uraiyaasiriyar), 1995, mudhal padhippu Nandhanaar , padhippagam, Chidhambaram.
3. Naga kumara kaaviyam , V . Sandhanam (vuraiyaasiriyar) , 1994 , Mudhal padhippu , nandhanaar pathippakam , Chidhambaram .
4. Sekkizhaar , 1970 , Periya puraanam , mudhal padhippu , Sree Kaasi madam , Thiruppanandhal .
5. Kampar , 1964 , Kamparaamaayanam , Ezhaam padhippu, Vai . Moo . Gopaalakrishnamaasaariyaar company , Chennai .
6. Ratchaniya yaathirigam , H . A . Krishnappillai , 1998 , mudhal padhippu , krithuva ilakkiya sangam , Chennai .
7. Seerappuraanam , Umaruppulavar , 1999 , mudhal padhippu , Kaviyogi Naachikkulathaar , Thiruvaarur Maavattam .

ghh;it E]y;fs;

1. ,ul;ilf; fhg;gpak; / t.R.g. khzpf;fk;.
2. ,yf;fpaj; jpwdha;t[,r';fs;/ bfhs;ifff; - mu';f. Rg;igah.
3. fk;gd; xU g[jpa ghh;it/ m.r. "hdrk;ge;jd;.
4. bghpa g[uhzk; xU Ma;t[/ m.r. "hdrk;ge;jd;.

Reference Books

- 15.Irattai kaappiyam , V . Su . Pa . Maanickam .
16. Ilakkiya thiranaaivu Isangal , Kolgaigal - Aranga Suppaiya .
- 17.Kamban oru puthiya paarvai , A.S.Gnanasambandhan .
- 18.Periya puraanam oru aaivu , A.S.Gnanasambandhan .

<https://youtu.be/E7zyM6XLfzE>

https://ta.m.wikipedia.org/wiki/%E0%AE%90%E0%AE%AE%E0%AF%8D%E0%AE%AA%E0%AF%86%E0%AE%B0%E0%AF%81%E0%AE%99%E0%AF%8D_%E0%AE%95%E0%AE%BE%E0%AE%AA%E0%AF%8D%E0%AE%AA%E0%AE%BF%E0%AE%AF%E0%AE%99%E0%AF%8D%E0%AE%95%E0%AE%B3%E0%AF%8D

<http://ta.vikaspedia.in/education/ba4baebbfbb4bcd-ba8bc2bb2bcd95bb3bcd/b87bb3ba8bbfbb2bc8-ba4baebbfbb4bbfbafbb2bcd-b-a-tamilology-b95bbbaabcbdaabbbafba4bcdba4bbfba9bcd-b87bb2b95bcd95ba3baebcd-baab95bc1ba4bbf-1-baabbe95baebcd-1>

<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	jkpH; kw;Wk; gpwbkhHp fhg;gpa';fisa[k;/ mtw;wpd; bfhs;;iffisa[k; mwpjy;. Thamizh mattrum piramozhi kappiyangalaiyum, avatrin kolgaigalairum arithal.
CO2	:	rpyg;gjpfhuk; t'';rpf;fhz;llk; KGtija[k; fw;wy;. Silappathigaram Vanjikandam muzhuvathaiyum kattral.
CO3	:	fhg;gpak; _yk; jkpH; kuiga[k; rkz/ bgsj;j jla';fisa[kk; g[hpar; bra;jy;. Kappiyam moolam thamizh marabaiyum, samana, boutha thadayangalaiyum puriya seithal.
CO4	:	fhg;gpa';fspy; fhzg;gLk; tha;bkhHp; TWfisa[k;/ bjhd;k';fisa[k; g[hpy;. Kappiyangalil kanapadum vaimozhi koorugalaiyum, thonmangalaiyum purithal.
CO5	:	gy rkaf; fhg;gpa';fisa[[k; fw;wy;. Palasamayangalil kappiyangalaiyum kattral.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	2	3	2	2
CO3	3	3	2	3	3
CO4	2	3	3	3	2
CO5	2	3	3	3	3
AVERAGE	2.6	2.8	2.8	2.8	2.6

bjhy;fhg;gpak; - bghUsjpfhuk; - II
Tholkappiyam – Porulathigaram - II

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

41. kdpj thH;f;iff;Fhpa mfk;/ g[w bka;g;ghLfis vLj;Jf; TWjy;.
42. ctik ea';fisg; ghly;fnshL bghUj;jpf; fhl;Ljy;.
43. kug[r; brhw;fis mwpar; bra;jy;.
44. bra;a[spy; ,lk;bgWk; jpiz/ Jiw/ ctik/ kug[fs; nghd;wtw;iw tpsf;fpf; TWjy;.
45. bra;a[spd; cWg;g[f;fisg; ghly;fnshL bghUj;jp ciuj;jy;.

Course Objectives :

41. Manitha vazhkaikuriya Agam, Pura meippadugalai eduthukooruthal.
42. Uvamai nayangalai padalgalodu poruthi kattuthal.
43. Marabu sorkalai ariya seithal.
44. Seyyulil idamperum thinai, thurai, uvamai, marabugal pondravatrai vilakki kooruthal.
45. Seyyulinn uruppugalai padalgaloduu poruthi uraiththal.

myF -1 :

bka;g;ghl;oay;

Alagu : 1

Meippattiyal

myF -2 :

ctkapay;

Alagu : 2

Uvamaiyiyal

myF -3 :

kugpay;

Alagu :3

Marabiyal

myF - 4:

bra;a[spay; - I (1-120 E]w;ghf;fs;)

Alagu :4

Cheyyuliyal-I (1-120 Noorpakkal)

myF - 5:

bra;a[spay; - II (121 - 241 E]w;ghf;fs;)

Alagu :5

Cheyyuliyal-II (121-241 Noorpakkal)

ghpe;Jiu E]y;:

1. bjhy;fhg;gpak; - bghUsjpfhuk;/ bjhy;fhg;gpah;/ jpUbey;ntyp bjd;dpe;jpa irtrpj;jhe;j E]w;gjpg;g[f; fHfk;/ brd;id-18.
2. bjhy;fhg;gpak; - bghUsjpfhuk;/ jpU"hdrk;ge;jh; ciu/ fjph; gjpg;gfk;/ 93/ bjw;F tPjp/ jpUitahW-613 204.

Recommended Books

1. Tholkappiyam – Porulathigaram, Tholkappiyar, Thirunelveli Thendinndiya Saiva Sidhantha Noorpathippu Kazhagam, Chennai – 18.
2. Tholkaapiyam –Poruladhigaram, Thirugnanasambandarr Urai, Kathir Pathippagam, 93, Therku Veethi, Thiruvaiyaru – 613204.

ghh;it E]y;fs;

1. bjhy;fhg;gpak; - bghUsjpfhuk;/ K.rz;Kfk;gps;is (g.M).
2. bjhy;fhg;gpak; - bghUsjpfhuk;/ r.nt.Rg;gpukzpak; (g.M).
3. bjhy;fhg;gpak; - bghUsjpfhuk;/ F.Re;ju_h;jjp (g.M).
4. bjhy;fhg;gpak; - bghUsjpfhuk;/ M.rptyp';fdhh;.
5. bjhy;fhg;gpaj; jpwd; - t.Rg.khzpf;fk;.

Reference Books

1. Tholkappiyam – Porulathigaram, M. Shanmugapillai (P.A).
2. Tholkappiyam – Porulathigaram, S.V. Subramaniyapillai (P.A).
3. Tholkappiyam – Porulathigaram, K. Sundaramoorthy (P.A).
4. Tholkappiyam – Porulathigaram, S. Sivalinganar.
5. Tholkappiya Thiran – V.S.P. Manikkam.

https://www.youtube.com/watch?v=nY_symZLli0
<https://www.youtube.com/watch?v=e0ojGUrwWc4>
<https://www.youtube.com/watch?v=YkfZW-GdAS8>
<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	kf;fspd; bka;g;ghLfis czh;e;J nghw;Wjy;. Makkalin meipadugalai unarnthu potruthal.
CO2	:	ctikfisf; bfhz;L bghUs; g[yg;ghl;L cj;jppiag; ghly;fnshL bghUj;jpf; TWjy;. Uvamaigalodu kondu porul pulappattu uthiyai padalgalodu poruthii kooruthal.
CO3	:	tHf;fpy; tH';fp tUk; m~wpiz/ cah;jpiz/ kug[r; brhw;fis ,d';fz;L gad;gLj;Jjy;.

		Vazhakkil vazhangil varum akrinai, uyarthinai, marabou sorkalai inagandu payanpaduthuthal.
CO4	:	bra;a[s;fspy; ,lk;bgWk; jpiz/ Jiw/ ctik/ kug[fs; nghd;wtw;iwg; gphpj;jwpjy;. Seyyulil idamperum thinai, thurai, uvamai, marabugal pondravatrai piritharithal.
CO5	:	bra;a[s;fspy; ,lk;bgWk; ghLbghUs;fs;/ tdg;g[fs;/ re;jntWghLfis mwpe;J gad;gLj;Jjy;. Seyyulil idamperum paduporulgal, vanappugal, santha verupadugalai arinthu payanpaduthuthuthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

tpUg;gg; ghlk; - gjpg;g[f; fiy
Viruppa Padam - Pathippukkalai

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

46. g[j];jf';fspd; njitia vz;zp mtw;iw gjpg;gpf;Fk; Kiwia czh;j;Jjy;.
47. mhpā g[j];jf';fspd; tUifiag; gw;wp khzhf;fpah;fspk; vLj;Jf; TWjy;.
48. ,yf;fpak; rhh;e;j g[j];jf';fSf;Fk;/ ,yf;fzk; rhh;e;j g[j];jf';fSf;Fk; Kd;Dhpik Twp czh;j;Jjy;.
49. tzpf nehf;nfhL ,y;yhky; fiy/ gz;ghLfis tsh;f;Fk; Mtzkhf ,Ug;gij czh;j;Jjy;.
50. g[j];jf';fspd; gad;ghLfis tpsf;fpf; TWjy;.

Course Objectives :

46. Buththagangalin thevaiyai ennii avatrai pathippikkum muraiyai unarththuthal.
47. Ariya buththagangalin varugaiyai patri manakkiyargalidam eduththu kooruthal.
48. Ilakkiyam sarntha buththagangalukkum, ilakkanam sarntha buththagangalukkum munnurimai koori unarthal.
49. Vaniga nookkodu illamal kalai, panpadugalai valarkkum avanamaga iruppathai unarththuthal.
50. Buththagangalin payanpadugalai vilakki kooruthal.

myF -1 :

mr;Rg;bghwpapd; mwpKfKk;/ Mjpf;fKk; - mr;Rg;bghwpapd; mikg;g[k; bray;ghLk;.

Alagu -1:

Acchuporiyin arimugamum, Athikkamum – Acchuporiyin amaippum.

myF - 2:

VL;Lr; Rtog; gjpg;g[- gjpg;g[tiffs;.

Alagu -2:

Ettu Suvadi Pathippu – Pathippu Vaigaigal.

myF - 3:

g[j];jf tiffs; - g[j];jf cWg;g[fs; - g[j];jf totk;.

Alagu -3:

Buththaga vaigaigal – Buththaga uruppugal – Buththaga vadivam.

myF - 4:

gjpg;ghrphpah; - gjpg;g[f;FG - btspapLgth; - jahhpg;g[eph;thfk; - gjpg;g[hpk;.

Alagu -4:

Pathippasiriyar – Pathippukuzhu – Veliyidubavar – Thayarippu nirvagam – Pathippurimai.

myF - 5:

tpw;gidahsh; - tpw;gida[hpk - tzpf epge;jidfs; - tpw;gid tHpfs;.

Alagu -5:

Virpanaiyalar – Virpanai urimai – Vaniga Nibanthanaigal – Virpanai Vazhigal.

ghpe;Jiu E]y;

g[j;jff; fiy/ lhf;lh;. m. tpehaf_h;j;jp/ ghyKUfd; gjpg;gfk;/ 63/ g[Jj;b]U/ br';nfhl;il/ fhl;gho - 632 007/ ntY]h; khtl;lk;.

Recommended Books

Buththaga Kalai, Dr. A. Vinayagamoorthy, Balamurugan Pathippagam, 63, Puthu Theru, Sengottai, Katpadi – 632007, Vellore District.

<http://www.tamilvu.org/ta/%E0%AE%A8%E0%AF%82%E0%AE%B2%E0%AE%95%E0%AE%AE%E0%AF%8D>

gad;fs; : Course Outcome

CO1	:	mr;Rg; bghwppapd; cjtp gjpg;g[f; fiyf;F kpft[k; mtrpak; vd;gij bjhpe;J bfhz;ldh;. Achuporiyin uthavi pathippu kalaikku migavum avasiyam enbathai therinthu kondanar.
CO2	:	Rtofs;/ ifbaGj;Jg; gpujpfspy; cs;s rpf;fy;fis khzhf;fpah;fs; czh;e;J bfhz;ldh;. Suvadigal, kaiyezhuththu prathigalil ulla sikkalgalai manakkiyargal unarnthu kondanar.

CO3	:	g[j];f tif/ Kd; ml;il/ gpd; ml;ilfs; gw;wpa fUj;Jf;fis gjpg;g[f;fiy _yk; bjhpe;J bfhz;ldh;. Buththaga vagai, muatttai, pinattaigal patriya karuththukkalai pathippukkalai moolam therinthu kondanar.
CO4	:	gjpg;ghrphpah;/ FG/ btspapLgth;/ gjpg;g[hpikg; gw;wpa tpsf;fkhd bra;jpfis mwpe;J bfhz;ldh;. Pathipasiriyar, Kuzhu, veliyidubavar, pathippurimai patriya vilakkamana seithigalai arinthu kondanar.
CO5	:	tpw;gid chpiknahL/ tzpf eph;thfj;ija[k; mwpe;jpUj;jy; mtrpak; vd;gijf; fw;Wf; bfhz;ldh;. Virpanai urimayodu, vaniga nirvagaththaiyum arinthiruththal avasiyam enbathai katra kondanar.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	3
CO2	3	3	3	3	2
CO3	2	3	2	3	3
CO4	2	2	3	3	3
CO5	3	3	3	3	3
AVERAGE	2.6	2.6	2.8	2.8	2.8

Rw;Wyhtpay; Suttrulaviyal

Total Hours : **Course Code** :
Credits : **L.T.P.** :

nehf;fk; :

51. cyf kf;fspilna njrpa xUikg;ghl;Lzh;it tsh;j;jy;.
52. Rw;Wyh _ykhf kf;fSila thH;f;if juj;ij cah;j;Jjy;.
53. Rw;Wyh _ykhf jdpkdpj mwptpid tpUj;jp mila bra;jy;.
54. kf;fspilna ey;y gz;ghl;L ghpkhw;w czh;t[fis Vw;gLj;Jjy;.
55. fiy kw;Wk; fpuhkpaf; fiyfis tsh;j;jy;.

Course Objectives :

51. Ulaga makkalidaye dheiya orumaipaataunaivai valarthal.
52. Suttrulaa moolamaga makkaludaya vaikaiyai tharathai uyarthuthal.
53. Suttruula moolamaga thanimanitha arivinai viruthi adaiya seithal.
54. Makkalidaiye nalla panpattu parimattra unarvugalai erpaduthuthual.
55. Kalai matrum grammiya kalaigalai valarthal.

myF -1 :

Rw;Wyh - tpsf;fk; - cyfehLfspy; Rw;Wyh tsh;r;rp - ghuj;jpy; Rw;Wyh tsh;r;rp.

Alagu -1:

Suttrula – Vilakkam – Ulaga nadugalil suttrula valarchi – Bharathaththil suttrula valarchi.

myF - 2:

jkpH;ehl;oy; Rw;Wyh tsh;r;rp - gd;dhl;Lg; gytifg; gazpfs; -
Rw;Wyhtpd; r_f bghUshjhu tpist[fs;.

Alagu -2:

Thamizh nattil Suttrula valarchi – Pannattu palvagai payanigal –
Suttrulavin samooga porulathara vilaivugal.

myF - 3

Rw;Wyhg; gazpfs; gw;wpa g[s;sp tptu';fs; - Rw;Wyhitj; jpl;lkpLjYk;/
nkk;gLj;JjYk; - Rw;Wyh tpLjpfs;.

Alagu -3:

Suttrula payanigal patriya pulli vivarangal – Suttrulavai
thittamiduthalum, membaduthuthalum – Suttrula viduthigal.

myF - 4:

Rw;Wyhg; gazpfspd; gy;ntW nghf;Ftuj;Jfs; - Rw;Wyhf; fHf';fs; -
Rw;Wyhg; gazKfth;fs;.

Alagu -4:

Suttrula payanigalin palveru pokkuvarathugal – Suttrula kazhagangal –
Suttrula payanamugavargal.

myF - 5

Rw;Wyhtpd; tzpfr; re;ijfs; - Rw;Wyhtpd; tHpfh;ofs; - jkpH;
,yf;fpaj;jpy; gaz E]y;fs;.

Alagu -5:

Suttrulavin vaniga santhaigal – Suttrulavin vazhikattigal – Thamizh
ilakkiyaththil payana noolgal.

ghpe;Jiu E]y;fs;

1. Rw;Wyh tsh;r;rp/ bt.fpUl;ozrhkp/ rhujh gjpg;gfk;/ brd;id.

Recommended Books

1. Suttrula Valarchi, V. Kiruttinasamy, Saradha Pathippagam, Chennai.

ghh;it E]y;fs;

1. ,e;jpa kug[r; Rw;Wyh/ rP.,uhkfpU\;zd;.
2. Rw;Wyhtpay; - Xh; mwpKfk;/ Kidth;.r.<!;tud;.
3. Rw;Wyhtpay; Xh; mwpKfk;/ k.uh.j';fkzp.

Reference Books

1. India Marabu Suttrula, S. Ramakrishnan.

2. Suttrulaviyal – Orr Arimugam, Dr. S. Eswaran.
3. Suttrulaviyal Orr Arimugam, M.R. Thangamani.

<https://ta.m.wikipedia.org/wiki/%E0%AE%A4%E0%AE%AE%E0%AE%BF%E0%AE%B4%E0%AE%95%E0%AE%A4%E0%AF%8D%E0%AE%A4%E0%AE%BF%E0%AE%B2%E0%AF%8D%E0%AE%9A%E0%AF%81%E0%AE%B1%E0%AF%8D%E0%AE%B1%E0%AF%81%E0%AE%B2%E0%AE%BE%E0%AE%B5%E0%AE%B3%E0%AE%B0%E0%AF%8D%E0%AE%9A%E0%AF%8D%E0%AE%9A%E0%AE%BF>

<https://ta.m.wikipedia.org/wiki/%E0%AE%9A%E0%AF%81%E0%AE%B1%E0%AF%8D%E0%AE%B1%E0%AF%81%E0%AE%B2%E0%AE%BE>

<https://www.panuval.com/suttrulaviyal-or-arimugam-10009453>

<https://www.udumalai.com/suttrulaviyal-or-arimugam.htm>

<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	Rw;Wyh cyf rnfhjuj;Jtj;ij tsh;f;Fk; vd;gij czh;;e;Jf; bfhz;ldh;. Sutruula ulaga sagotharathuvathai valarkum enbathai unarnthu kondanar.
CO2	:	gd;dhl;L gazpah;fspd; Rw;Wyhf; fhQk; Mh;tj;ij mwpe;J bfhz;ldh;. Pannattu payaniyargalin, sutrula kanum arvathai arinthu kondanar.
CO3	:	ehLfSf;fpilnaahd bjhHpy;El;gj;ij mwpe;J jpl;lkpl;L Rw;Wyhj; Jiwia tsh;j;bJLj;jiy bra;jy; ekJ flik vd czh;e;Js;sdh;. Nadugallukinaiyeyana thozhil nutpathai arinthu thitamittu sutrula thiraiyai valartheduthalai seithal namathu kadamai ena unarnthullanar.
CO4	:	gy;ntW ehLfs; Rw;Wyhthy; el;g[wt[ehLfshf tps';FfpwJ vd;gij czh;e;jdh;. Palveru nadugal sutrulaval natpuravu nadugalaga vilangugirathu enbathai unarnthanar.
CO5	:	Rw;Wyhtpw;F jkpH; gaz ,yf;fpa';fs; tHpfl;oahf tps';FfpwJ vd;gij czh;e;jdh;. Sutrulavirku thamizh inai ilakkiyangal vazhikattiyaga vilangugirathu enbathai unarnthanar.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	3
CO2	3	2	3	3	3
CO3	2	3	3	2	2
CO4	3	3	2	3	3
CO5	2	2	2	2	2
AVERAGE	2.6	2.4	2.6	2.4	2.6

,uz;lkhz;L - _d;whk; gUtk;

Second Year – Third Semester

r';f ,yf;fpak;

Sanga Ilakkiyam

Total Hours :

Credits :

Course Code :

L.T.P. :

nehf;fk; :

56. r';f fhy murh;/ g[yth;/ njhHp nghd;w khe;jh;fspd; jdpj;jpwd;fis vLj;Jf;fhl;Ljy;.
57. r';f fhyj;J murpay;/ nggh; bewpfs; nghd;w thH;tpay; TWfisg; ghly;fsfy; Mtzg;gLj;jg;gl;Ls;s gh';fpid mwpaf; TWjy;.
58. ,aw;ifnahL ,iae;j thH;f;if Kiwiag; nghw;wpa bewpfis tpsf;fpf; TWjy;.
59. mfg;g[w ,yf;fz';fnshL ghly;fis xg;gpl;Lf; fhl;Ljy;.
60. jkpH;r; r_f cUthf;fk; kw;Wk; fyhr;rhu gz;ghl;Lf; TWfis kjpg;gplf; fw;Wf; bfhl;Ljy;.

Course Objectives :

56. Sanga Kaala Arasar, Pulavar, Tozhi Pondra Maantargalin Tanitiramaigalai Eduttukaatuthal.
57. Sanga Kaalattu Arasiyal, Por Nerigal Pondra Vazhviyal Kuurugalai Paadalgalil Aavanapadutulla Paanginai Ariya Kuruthal.

58. Eyarkaiyodu Eyainta Vazhkai Muraiyai Pottriya Nerigalai Vilakki kuruthal.
59. Agappura Elakkiyangalodu Paadalgalai Oppittu Kaatuthal.
60. Tamizh Samuga Vuruvaakam Matrum Kalachaara Panpaatu Kurugalai Matipida Katru Koduthal.

myF -1 :

g[yth; jdpj;jpwd;: 'g[yth;' brhy; tpsf;fk; - mfg;bghUs; g[wg;bghUs; kl;Lk; ghonahh; - mfKk; g[wKk; ghonahh; - bgz;ghw;g[yth;fs; - ghLbghUs;: mwpt[iu - cyfpaypaw;if - epiyahik - thH;j;jy; - g[yth;fspd; g[yik - czh;t[fs; - ifahz;l ctikfs;/ fw;gidfs; - rpwg;g[brhw;bwhlh;fs; - rpwg;g[g; ghh;it : xsitahh; ghly;fspd; jdpj;jpwd;.

Alagu – 1

Pulavar Tanitiran ; 'Pulavar' Sol Vilakkam – Agaporum Puraporul mattum Paadiyor – Agamum Puramum Paadiyor – Penpaatpulavargal – Paaduporul; Arivurai – Vulagiyaliyarkai – Nelaiyaamai – Vaazhthal – Pulavagalin Pulamai – Vunarvugal – Kaiyanda Vuvamaigal, Karpanaigal – Sirappu Sotrodargal – Sirappu Paarvai; Avvaiyaar Paadalgalin Tanitiran.

myF - 2:

murh; jdpj;jpwd;: 'iw' ,yf;fzk; - _nte;jh; - FWepykd;dh;fs; - murh;fspd; mUl;jd;ik - bfhw;wk; - nkyhz;ik;jpwwd; - ehl;L tsk; - gifaurh;fspd; jpwwd; - nte;jUk; nghUk; - nte;jUk; gpwkhe;jUk; - g[yth;fshf tps';fpa murh;fs; - rpwg;g[g; ghh;it - nfhg;bgU";nrhHd; (ghoa ghly;fSk;/ mtidg; gpwh; ghly;fSk;)

Alagu – 2

Arasar Tanitiran; 'Erai' Elakkanam – Muventhar – Kurunilamannargal – Arasargalin Arutanmai – Kotram – Melaanmaitiran – Naatu Valam – Pagaiyarasargalin Tiran – Ventharum Porum – Vendharum Piramaandarum – Pulavargalaaga Vilangiya Arasargal – Sirappu Paarvai – Kopperunchozhan (Paadiya Paadalgalum, Avanai Pirar Paadiya Paadalgalum)

myF - 3:

fij khe;jh; jdpj;jpwd;: khe;jh; mwpKfk; - njhHpa[k; gh';fDk; - njhHpapd; mwpt[j;jpwwd; - njhHpapd; brhy;yhw;wy; - njhHp Fwpg;g[g; bghUis MSk; rpwg;g[- njhHpapd; MSikj; jpwwd; - fstpy; njhHpapd; bray; jpwwd; - nrl;gL;jy; - Fiweaj;jy; - FwpgWj;jy; - tiut[flhjy; - fw;gpy; njhHpapd; bray;jpwwd; - brytG';Ftpj;jy; - Mw;Wtpj;jy; - thapd; kWj;jy; - neh;jy; - rpwg;g[g; ghh;it :(njhHpapd; Tw;Wg;ghly;fs;) FWE;bjhif: 22/ 26/ 55/ 146/ 284/ I';FWE]W: 8 (ntl;ifg; gj;J)/ 103/ 109 (jha;Fiuf;fg; gj;J)/ 153 (bts;sh';FUFg; gj;J)/ 226 (mk;kthHpg; gj;J) ew;wpiz: 10/ 35/ 127/ 227/ 326.

Alagu – 3

Kathai Maanthar Tanitiran; Maanthar Arimugam – Tozhiyum Paanganum – Tozhiyin Arivurai Tiran – Tozhiyin Sollatral – Tozhi Kurippu Porulai Aalum Sirappu – Toziyin Alumaitiran – Kalavil Tozhiyin Seyal tiran – Setpaduthal – Kurainayathal – Kurumaruthal – Varaivu Kadaathal – Katpiyal Tozhiyin Seyaltiran – Selavazhunguvithal – Aatruvithal – Vaayin Maruthal – Nerthal Serappu Paarvai; (Tozhiyin Kuutrupaadalgal) Kuruntogai; 22, 26, 55, 146, 284, Inkurunooru; 8 (Vetkai Pathu), 103, 109, (Taaikuraikka Pathu), 153, (Vellangurukku Pathu), 226 (Ammavazhi Pathu) Natrinai; 10,35, 127, 227, 326.

myF - 4:

mf ,yf;fpaf; bfhs;iffs;: le;jpizr; NHy; Fwpj;j bfhs;if - jpiz kaf;fk; - fst[Fwpj;j tpsf;fk; - ,aw;ifg; g[zh;r;rp - myh; - btwpahl;L - mwj;bjhL epw;wy; - fw;g[gw;wpa tpsf;fk; - ,y;yw bewp - gphpt[epiy - mfg;ghly; neh;fpay; - mf ,yf;fpa btspaPl;L kug[fs; - jiykf;fSld; bjhlh;g[ilnahh; rpwg;g[g; gh;it thapy;fs;: brtpyp (mfk;. 216/ FWe;. 44/ 84/ l';. 401)/ ew;wha; (ew;. 297/ l';. 376/ mfk;. 375/ 12)/ njhHp (mfk;. 12/ l';. 56/ 245/ FWeP. 196)/ gh';fd; (l';. 173)/ ghzh; (l';. 480)/ fz;nlhh; (l';. 386)/ mwpth; (FW. 295).

Alagu – 4

Aga Elakkiya Kolkaigal; Intinai Suzhal Kuruttha Kolkai – Tinai Mayakkam – Kalavu Kuritha Vilakkam – Eayarkai Punarchi – Aalar – Veriyattu – Aratodu Nitral – Katpu Patriya Vilakkam - -Ellara Neri – Pirivu Nelai – Agapaadal Nokkiyal – Aga Elakkiya Veliyeetu Marabugal – Talaimakkaludan Todarpudaiyor Serappu Paarvai Vaayilgal; Sevili (Agam. 216, Kurun. 44, 84, Inguru. 401), Natray (Nat. 297, Inguru.376, Agam 375, 12), Tozhi (Agam. 12, Ing. 56, 245, Kuruni. 196), Paangan (Ingu. 173), Paanar (Ingu. 480), Kandor (Ingu. 386), Arivar (Kuru. 295).

myF - 5:

g[w ,yf;fpaf; bfhs;iffs;: g[wj; jpizfs; - mfg;g[wk; - g[wj;jpiz khe;jh; - nte;jUk; tPuUk; - nte;jUk; ,utyUk; - nghh;bewp - gilf;fyd;fs; - eLf; tHpghL - tPuk; - ts;sd;ik - g[fH; - Ml;rpj;jpwd; - mwbeWPfs; JJJ - tuyhw;Wr; bra;jpfs; - rpwg;g[g; gh;it - Mw;Wg;gil (rpWghzhw;Wg;gil KGtJk;).

Alagu –5

Pura ilakkiya kolgaikal; pura thinaigal – agappuram – purathinai maanthar – vendharum veerarum – vendharum iravalarum – poorneri – padaikalangal – nadukal vazhipadu – veeram – vallamai – pugazh – aachithiran – aranerigal thoothu- varalatu seithgal – serappu paarvai – aatrappadai (serupaanaatrappadai muzhuvathum).

ghpe;Jiu E]y;fs;

1. r';f ,yf;fpak;/ Kidth; r.nt.Rg;gpukzpad; (g.M.)/ Kjw;gjpg;g[jprk;gh;

2006/ kzpthrff; E]yfk;/ brd;id-108.

2. r';f ,yf;fpa ciu/ irtrpj;jhe;j E]w;gjpg;g[f; fHfk;/ brd;id-18.

Recommended Book

1. sanga ilakkiya , munaiva s. v. subramaniyan (p.a.), mudharpathippu, thisambar 2006, manivaasagar noolagam, Chennai-108.
2. Sanga ilakkiya urai, saivasethantha noorpathippuk kazhgam, Chennai-18.

ghh;it E]y;fs;

1. r';f ,yf;fpa Ma;t[fSk; ml;ltizfSk; - nguhrphpah;. e.r";rPtp fl;Liufs;/ (bjhFg;ghrphpah; nguh. fht;ah rz;KfRe;juk;).
2. r';f ,yf;fpaj;jpy; njhHp/ Kidth;. rush uh#nfhghyd;.
3. mw ,yf;fpaf; bfhs;iffs; - eh.Rg;g[bul;oahh;.
4. jkpHh;fspd; nghh;Kiwfs; - jkpH; ehl;Lg;gilf; fyd;fs;/ rhj;jhd; Fsk;/ m.,uhftd;.
5. jkpH; tPuepiyf; ftpijfs;/ f.ifyhrjgp.
6. r';f ,yf;fpaj;jpy; nte;jh;/ mu';f ,uhkyp';fk;.

Reference Books

- 19.sanga ilakkiya aaivugalum attavanaigalum- peraseriyar. N. sanjivee katturaigal, (thoppasiriyar prof.kaaviya sanmugasundharam).
- 20.Sanga ilakkiyathil dhozhi, munaivar. Saralaa rajagoppalan.
- 21.Ara ilakkiya kolgaikal – n. suppurediyar.
- 22.Thamizhargalin poormuraigal – thamizh naattuppadai kalangal, chathanaar kulam, a. raghavan.
- 23.Thamizh veerani laik kavithaigal, k. kailaasaoathi.
- 24.Sanga ilakkiyathil vendhar, aranga raamalingam.

<https://youtu.be/d9Euzs7Evf0>

https://www.youtube.com/watch?v=xgdjj0iz_g4

<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	g[yth;fspd; jdpj;jpwd;fis tps';fpf; bfhs;Sjy;. Pulavargalin thanithirangalai vilakki kolluthal.
CO2	:	murh;fspd;/ jdpj;jpwd;fisg; goj;jwpjy;. Arasargalin, thanithirankalaip paditharithal.
CO3	:	mftH;f;ifapy; el;gpd; MSikiag; g[hpe;J bfhs;Sjy;.

		Agavazhiviyal nattpin aalumaiyaip purinthu kolluthal.
CO4	:	mf ,yf;fpaf; bfhs;iffisg; ghly;fspy; bghUj;jpg; ghh;j;jwpjy;. Aga ilakkiya kollgakalai padaigalil poruthip paartharithal.
CO5	:	r';f fhy kf;fspd; ,yf;fpaf; nfhl;ghLfisg; ghly;fnshL ,izj;Jg; ghh;j;jwpjy;. Sanga kaala makkalin ilakkiya kootpaadukali padalgaload inathup paartharithal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	2	2
CO3	3	3	3	3	3
CO4	2	2	2	3	3
CO5	3	3	3	3	3
AVERAGE	2.8	2.8	2.8	2.8	2.8

**jhs; : 10 bjhy;fhg;gpak; - brhy;yjpfhuk;
Paper:10 : Tholkappiyam - Sollathigaram**

Total Hours	:		:	Course Code
Credits	:		:	L.T.P.

nehf;fk; :

61. ,yf;fz E]y;fSs; bjhy;fhg;gpaj;jpd; rpwg;g[fisf; Twp/ vGj;Jf;fspd; tot';fis tpsf;Fjy;.
62. vGj;Jf;fspd; tiffis vLj;Jff; TWjy;.
63. vGj;Jf;fs; g[zh;r;rp tpjpfis tpsf;fpf;fhl;ly;.
64. ciuahrphpah;fs; ciujpwid tpthpj;jy;.
65. vGj;Jg;gpiHapd;wp vGj gapw;rp mspj;jy;.

Course Objectives :

61. Ilakkana noolgalul tholkappiyathin sirappugalai koori, ezhuthugalin vadivangalai vilakkuthal.
62. Ezhuthukalin vagaigalai eduthukooruthal.
63. Ezhuthukkal punarchi vidhigalai vilakki kattal.
64. Uraiyasiriyargal uraithiranai vivarithal.
65. Ezhuthupizhaiindri ezhutha payirchi alithal.

myF -1 :

E]d;kug[
bkhHp kug[
gpwg;gpay;

Alagu –1

Nunmarabu
Mozhimarabu
Pirappiyal

myF -2 :

g[zhpay;
bjhif kug[
cUgpay;

Alagu – 2

Punariyal
Thogaimarabu
Urubiyal

myF -3 :

caph; ka';fpay;

Alagu – 3

Uyir mayangiyal

myF - 4:

g[s;sp ka';fpay;

Alagu – 4

Pulli mayangiyal

myF - 5:

Fw;wpaYfug; g[zhpay;

Alagu – 5

Kutriyalugara Punariyal

ghpe;Jiu E]y;:

1. bjhy;fhg;gpak; - vGj;jjpfhuk;/ bjhy;fhg;gpah;/ jpUbey;ntyp bjd;dpe;jpa
irtrpj;jhe;j E]w;gjpg;g[f; fHfk;/ brd;id-18.
2. bjhy;fhg;gpak; - vGj;jjpfhuk;/ _yKk; ciua[k;/ Kidth;.jpU"hdrk;ge;jk; (ciu)/
fjph; gjpg;gfk;/ jpUitahW-613204.

Recommended Book

1. Tholkappiyam – Ezhuthathigaram, Tholkappiyar, Tirunelveli Thennindiya Saiva Siddantha Noorpathippu Kazhagam, Chennai-18.
2. Tholkappiyam – Ezhuthathigaram, Moolamum uraiyum, Prof. Thirugnanasambandam (Urai), Kathir Pathippagam, Thiruvaiyaru-613204.

ghh;it E]y;fs;

1. bjhy;fhg;gpak; - vGj;jjpfhuk;/ K.rz;Kfk;gps;is (v.M).
2. bjhy;fhg;gpak; - vGj;jjpfhuk;/ r.nt.Rg;gpukzpak; (g.M).
3. bjhy;fhg;gpak; - vGj;jjpfhuk;/ F.Re;ju_h;j;jp (v.M).
4. bjhy;fhg;gpa ciutsk;; - M.rptyp';fdhh;.
5. vGj;jpay; - N.,d;dhrp.

Reference Books

- 25.Tholkappiyam – Ezhuthathigaram, M. Shanmugampillai (E.A.)
- 26.Tholkappiyam – Ezhuthathigaram, S.V. Subramaniam (P.A.)
- 27.Tholkappiyam – Ezhuthathigaram, K. Sundaramurthy (E.A.)
- 28.Tholkappiya Uraivalam – A. Sivalinganar.
- 29.Ezhuthiyal – S. Innachi.

<https://www.youtube.com/watch?v=v8FnqC3K28c>

<https://www.youtube.com/watch?v=vv38hoCewDA>

<https://www.youtube.com/watch?v=rT9Y5-LOPcQ>

<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	jkpH; bkhHpapYs;s vGj;Jf;fspd; tiffs;/ gpwg;g[Kiwfis mwpe;J bfhs;Sjy;. Thamizh mozhiyilulla ezhuthukkalin vagaigal, pirappu muraigalai arinthu kolluthal.
CO2	:	vGj;Jf;fs; g[zUk; epiyfisg; bghUj;jpg; ghh;j;jy;. Ezhuthukkal punarum nilaigalai poruthiparthal.
CO3	:	caph; vGj;Jf;fs; g[zUk; tpjpfisr; rhd;WfnshL ,izj;Jf; fhl;Ljy;. Uyil ezhuthukkal punarum vithigalai sandrugalodu inaitu kattuthal.
CO4	:	g[s;sp vGj;Jf;fs; g[zUk; tpjpfisr; rhd;WfnshL tpsf;fpf; TWjy;. Pulli ezhuthukkal punarum vithigalai sandrugalodu vilakki kooruthal.
CO5	:	Fw;wpaYfug; g[zh;r;rp tpjpfisa[[k; ciuahrpah;fspd; ciu jpwidak; vLj;Jf;fhl;Ljy;.

	Kutriyalugara punarchi vidhigalaiyum uraiasiriyargalin urai thiranaikum eduthukattuthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	2	2
CO4	2	2	2	3	3
CO5	3	3	3	3	3
AVERAGE	2.8	2.8	2.8	2.8	2.8

jkpHh; gz;ghl;L tuyhW
Thamizhar Panpattu Varalaru

Total Hours : **Course Code :**
Credits : **L.T.P. :**

nehf;fk; :

66. r';f fhyj;J thH;f;if tHp gz;ila ehfhpfj;ij mwpe;J bfhs;Sjy;.
67. gz;ila fy;tp Kiwa[k;/ thdpaYk;/ tpisahll;L ,it jkpHhpd; g[yikia mwpe;J bfhs;s KofpwJ.
68. fiyfspd rpwg;ig fw;Wf; bfhs;Sjy;.
69. jkpHhpd; kUj;JtKk;/ ePjpj;Jiwa[k; bgw;w Kiwikfis vLj;Jiuj;jy;.
- gpw rka';fshy; jkpH; gz;ghl;L epiyi mwpjy;.
70. cs;shl;rp Kiwiaa[k;/ ,e;jpa ehfhpfj;jpy; jkpH;g; gz;ghl;il mwpjy;.

Course Objectives :

66. Sanga Kaalattu Vazhikai Vazhi Pandaiya Nagarigathai Arintu Kolluthal.
67. Pandaiya Kalvi muraiyum, Vaaniyalum, Velaiyaatu Evai Tamizharin Pulamaiyai arintu kola mudigiratu.
68. Kalaigalin Sirapai Katru kolluthal.
69. Tamizhrin Maruthuvamum, Neeti Turaiyum petra muraimaigalai eduturaittal. Pera Samayangalaal Tamizh Panpaatu nelaiyai arithal.
70. Vullazhchi muraiyaiyum, India Nagareegathil Tamizh Panpaatai arithal.

myF -1 :

gz;ghL - vJ ehfhpfk;? - epiwepiyg; gz;ghL - jkpH;g; gz;ghL ,d;iwa
epiya[k; njita[k; - ehfhpfKk; gz;ghLk; - r';f fhyj;J murpay; epiy - r';f
fhyg;nggh; Kiw - r';f fhyj; bjhHpw; gphptdUk; r_f mikg;g[k; - gz;ilj;
jkpHhpd; jpUkzKiw - FLk;g thH;t[gw;wpa jkpHh; bfhs;f.

Alagu – 1

Panpaatu – Etu Naagarigam? – Nerainelai Panpaatu – Tamizh Panpaadu
Endraiya Nelayum Tevaiyum – Nagarigamum Panpaadum – Sanga Kaalattu
Arasiyal Nelai – Sanga Kaalapor Murai – Sanga Kaala Tozhth Pirivinarum Sanga
Amaippum – Pandai Tamizharin Tirumana Murai – Kudumba Vaazhvu Patriya
Tamizhar Kolkai.

myF - 2:

jkpH;ehl;L tzpf tsk; - gz;ilj; jkpHhpd; cz[t/ cil/ ciwa[s; - ,wg;g[<kr;l';F
eLf; / bjd;g[yj;jhh; fld; - gz;ilj; jkpHhpd; fy;tp epiy - gz;ilj; jkpHhpd;
thdpay; Ma;t[- gz;ilj; jkpHhpd; tpisahl;Lk; bghGJnghf;Fk; - r';fj;
jkpHhpd; rka thH;t[- Mhpa nts;tp bewp - r';f fhy tpHhf;fs;.

Alagu – 2

Tamizhnaatu Vaniga Valam – Pandaiya Tamizharin Vunavu, Vudai,
Vuraiyul – Erappu, Ema Sadangu Naduthal, Tenpulathar Kadan – Pandai
Tamizharin Kalvi Neelai – Pandaiya Tamizharin Vaaniyal – Pandaiya
Tamizharin Velaiyaatum Pozhutupokkum – Sanga Tamizharin Sanga
Tamizharin Samaya Vaazhvu – Aariya Velvi Neri – Sanga Kaala Vizhakkal.

myF - 3:

r';fg; g[yth; gz;ghL - gHe;jkpHhpd; ek;gpf;iffs; - jkpHh; fz;l ey;ywk; -
,irf; fiyapd; tuyhW - jkpHfr; rpw;gf; fiy - jpy;iyf; Tj;jdpd; jpUeldk; -
jkpHff; nfhapy; fl;olf;fiy tsh;r;rp - Xtpaf;fiy - Tj;Jf;fiy.

Alagu – 3

Sanga Kaalattu Panpaadu – Pazhantamizharin Nambikkaigal – Tamizhar
Kanda Nallaram – Esai Kalaiyin Varalaaru – Tamizhaga Sirpa Kalai – Tillai
Kuuthanin Tirunadanam – Tamizhaga Kovil Kattidakalai Valarchi – Oviyakkalai
– Kuutukkali.

myF - 4:

kUj;Jtf;fiy - ehlf; fiy - jkpH;g; gz;ghl;oy; irt itzt rka';fs; - jkpH;g;
gz;ghl;oy; rkz/ bgsj;j rka';fs; - jkpH;g; gz;ghl;oy; ,Ryhk; rkak; - ePjpi;
Jiwapd; tuyhW - ,ilf;fhyf; nfhapy;fspd; gzpfs; - jkpH; ehl;lurpaypy;
thpfs; - jkpHff; fhRfspd; tuyhW.

Alagu – 4

Maruttuvakkalai – Naadaga Kalai – Tamizh Panpaatil Seiva Vainava
Samayangal – Tamizh Panpaatil Samana, Powtha, Samayangal – Tamizh

Panpaatil Eslaam Samayam – Neeti Turaiyin Varalaaru – Edai Kaala Kovilgalin Panigal – Tamizh Naatarasiyalil Varigal – Tamizhaga Kaasugalin Varalaaru.

myF - 5:

cs;shl;rp kd;w';fspd; tuyhW - ,ilf; fhyj; bjhHpW; r';f';fs; - r';f fhyj;jpw;Fg; gpd; rhjpfspd; tsh;r;rp - rhjpbahHpg;g[Kaw;rpfs; - kfsph; epiy - khh;f;nfhngghnyh fz;l ghz;oa ehl;Lepiy - ,e;jpa ehfhpfj;jpy; jkpH;g; gz;ghl;Lf; TWfs; - jkpH;g; gz;ghl;oy; M';fpy Ml;rpapd; bry;thf;F - kuhl;oah; bra;j ed;ikfs; - tha;bkhHp ,yf;fpa';fSk; jkpH;g; gz;ghLk; - gHbkhHpa[k; gz;ghLk; - rkag; bghJ neh;f;F - gz;ghl;L Clhl;lk;.

Alagu – 5

Vullazhchi Mandrangalin Varalaaru – Edai Kaala Tozhth SangaGalin – Sanga Kaalatukku Pin Saatigalin Valarchi – Saatiyohippu Muyarchigal – Magalir Neelai – Maargopolo Kanda Pandiya Naatu Nelai – Indiya Nagarigathil Tamizh Panpaatu Kuurugal – Tamizh Panpaatil Aangila Aazhchiyin Selvaakku – Maraatiyar Seita Nanmaigal – Vaai mozhi Elakkiyangalum Tamizh Panpaadum – Pazhamozhiyum Panpaadum – Samaya Pothu Nokku – Panpaatu Vuudaatam.

ghpe;Jiu E]y;fs;

1. jkpH;g; gz;ghl;L tuyhW - br.itj;jpayp'fd;/ vk;.V./ vk;.ypl;/ mz;zhkiyg; gy;fiyf;fHf btspaPL/ 1991.
2. jkpHh; ehfhpfKk;/ gz;ghLk;- lhf;lh; m.jl;rpzh_h;j;jp / ahH; gjpg;gfk;/ Kjy; gjpg;g[brg;lk;gh; (1994).

Recommended Book

1. Thamizh Panpattu Varalaru – S. Vaithiyalingan, M.A., M.Lit., Annamalai University Publication, 1991.
2. Thamizhar Nagarigamum, Panpadum – Prof. A. Dhatchinamoorthy, Yazh Publication, First Edition, September (1994).

ghh;it E]y;fs;

1. r';f fhyj; jkpHh; thH;tpay;/ e.Rg;ukzpak;
2. r';f fhyj; jkpHh; thH;t[ny.g.fU.,uhkehjd; brl;oahh;
3. jkpHf tuyhW kf;fSk; gz;ghLk; - nf.nf.gps;is.
4. jkpHh; rhy;g[R.tpj;ah ee;jd;
5. jkpHh; ehfhpfKk; gz;ghLk;/ njtneag; ghthzh;.
6. jkpHh; ehfhpfKk; gz;ghLk;/ k."h. ,uhrkhzpf;fdhh;.
7. jkpHh; tsh;j;j mHf;f; fiyfs;/ kapiy.rPdp.nt';flrhkp.
8. jkpHh; thH;tpay;/ rp.,yf;Ftdhh;.

Reference Books

- 30.Sangakala Thamizhar Vazhviyal, N. Subramaniam.
- 31.Sangakala Thanizhar Vazhvu, L.P.R.Ramanathan Chettiyar.

- 32.Thamizhaga Varalaru Makkalum Panpadum – K.K. Pillai.
 33.Thamizhar Sallbu, S. Vidhya Nandan.
 34.Thamizhar Nagarigamum Panpadum, M.G.Rasamanikkanar.
 35.Thamizhar Valartha Azhagu Kalaigal, Mayilai. Seeni.Vengadasamy.
 36.Thamizhar Vazhviyal, S. Ilakkuvanar.

<https://www.youtube.com/watch?v=hzUTBAoVhec>

<https://www.youtube.com/watch?v=45ZCfFgCSBk>

<https://www.youtube.com/watch?v=VPd43jklpok>

<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	gz;ila jkpHh;fspd; mwthH;tpid mwpe;J gad; miljy;. Pandaiya thamizhargalin aravazhvina arinthu payan adaithal.
CO2	:	fy;tpapd; cah;t[k; mwptpaypd; El;gKk; czh;jy;. Kalviyin uyarvum ariviyalin nutpamum unarthal.
CO3	:	jkpHhpdp; mwKk; fiyfspd; Ez;zwpt[k; fw;Wf; bfhs;Sjy;. Thamizharin aramum kalaigalin nunarivum katrukolluthal.
CO4	:	jkpHh; gz;ghl;oid gpw rka';fs; ghjpf;fhj epiya[k; kUj;JtKk; ePjpa[k; ,d;Wk; eilKiwapy; tH';Ftij gadhff; bfhs;Sjy;. Thamizhar panpattinai pira samayangal pathikkatha nilaiyum maruthuvamum, neethiyum indrum nadaimuraiyil vazhanguvathai payanaga kolluthal.
CO5	:	gz;ila cs;shl;rp Kiw ,d;iwa epiynahLk; ,e;jpa ehfhpfj;jpy; jkpH;g; gz;ghl;od; bgUikia czh;e;J bfhs;Sjy;. Pandaiya ullatchi murai indraiya nilaiyodum indiya nagarigathil thamizh panpattin perumaiyai unarnthu kolluthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	2	2	2
CO4	2	2	3	3	3

CO5	3	3	3	3	3
AVERAGE	2.8	2.8	2.8	2.8	2.8

**jhs;: 12 : rKjha bkhHpapay;
Paper: 12 : Samudaya Mozhiyiyal**

Total Hours : **Course Code** :
Credits : **L.T.P.** :

nehf;fk; :

71. bkhHpa[k; rKjhaKk; gw;wp bjhp;J bfhs;;sy;.
72. rKjha';fSf;fpilna cs;s bkhHp ntWghl;il mwpjy;.
73. gd;bkhHpf; nfhl;ghLfisf; fz;Lzh;jy;.
74. bkhHp rKjhaj;ij MSk; jd;ikia czh;jy;.
75. rKjhak; kw;Wk; bkhHp rhh;e;j ,dk; gw;wpa mwpitg; bgWjy;.

Course Objectives :

71. Mozhiyum Samudayamum patri therinthu kollal.
72. Samudayangalukidaiye ulla mozhi veruppattai arithal.
73. Panmozhi kotpadugalai kandunarthal.
74. Mozhi samuthayathai aalum thanmaiya unarthal.
75. Samudhayam mattrum mozhi sarntha inam patriya arivai peruthal.

myF -1 :

bkhHpa[k; r_fKk; - rKjha bkhHpapay; - bkhHpa[k; r_fj; jFjpfSk; - bkhHpa[k; kugpdf;FGf;fSk; - bkhHp vGj;Jf;fspd; mikg;g[- ,ul;il tHf;F.

Alagu – 1

Mozhiyum samoogamum – Samudhaya mozhiyiyal – mozhiyum samooga thaguthigalum – mozhiyum marabinakuzhukkalum – mozhi ezhuthukkalin amaippu – irattai vazhakku.

myF - 2:

bkhHpa[k; rKjhar; NH;epiya[k; - bkhHpa[k; NHYk; - ngr;Rtpid.

Alagu – 2

Mozhiyum samudhaya choozhnilaiyum – mozhiyum choozhalum – pechuvina.

myF - 3

jkpHpd; tl;ihu ntWghLfs; - jkpHpy; r_f tHf;Ffs; - bkhHpa[k; r_fg; ghFghLfSk; - bkhHpa[k; fpis bkhHpfSk; - bkhHp tiffs; - bkhHpj;jpl;lkpLjy;.

Alagu – 3

Thamizhin vattara verupadugal – thamizhil samooga vazhakkugal – mozhiyum samooga pagupadugalum – mozhiyum kilai mozhigalum – mozhi vagaigal – mozhi thittamiduthal.

myF - 4:

bkhHpf; FWf;fPLfs; - bkhHpf;fyg;g[- ,UbkhHpa tiffs; - jkpHf ,UbkhHpa Ma;t[fs;.

Alagu – 4

Mozhi aivukurukkedugal – mozhikalappu – irumozhiya vagaigal – thamizhaga irumozhiya ayivugal.

myF - 5

bkhHpa[k; gz;ghLk; - cwt[Kiwr; brhw;fs; - jkpHpd; ngr;R ntw;Wikfs; - gz;ghl;L tuyhW/ gutyhf;fk;/ fyg;g[.

Alagu – 5

Mozhiyum panpadum – uravumurai sorkal – thamizhin pechu vetrumaigal – panpattu varalaru, paravalakkam, kallappu.

ghpe;Jiu E]y;

1. rKjha bkhHpapay; (bjhFg;g[[]/ mz;zhkiyg; gy;fiyf;fHf btspaPL.
2. bkhHpapay; - ,uh.rPdpthrd;/ rhujh gjpg;gfk;/ brd;id-14.

Recommended Book

1. Samudhaya Mozhiyiyal (Thoguppu), Annamalai University Publications.
2. Mozhiyiyal – R. Sreenivasan, Saradha Pathippagam, Chennai-14.

ghh;it E]y;fs;

6. rKjha bkhHpapay; - fp.fUzhfud;/ bka;ag;gd; gjpg;gfk;/ 2011.
7. ,f;fhy bkhHpapay; mwpKfk; - Kidth;.F.gukrptd;.
8. bkhHptuyhW/ lhf;lh;. K.t.
9. bkhHpapay; njhw;wKk;/ tsh;r;rpa[k;/ Kidth;. "hdk;.
10. jkpH;bkhHp tuyhW/ R. rf;jpnty;.

Reference Books

- 37.Samudhaya Mozhiyiyal – K. Karunagaran, Meiyappan Pathippagam, 2011.
- 38.Ikkala Mozhiyiyal Arimugam – Prof. K. Paramasivan.
- 39.Mozhi Varalaru, Prof. M.V.
- 40.Mozhiyiyal Thotramum, Valarchiyum, Prof. Gnanam.
- 41.Thamizh Mozhi Varalaru, S. Sakthivel.

gad;fs; : Course Outcome

CO1	:	bkhHpfsdpd; neh;fkhd kdpj ,dj;jpd; epiyngw;iw tYthf;Fjy;. Mozhigalin nokkamana manitha inathin nilaipettrai valuvakkuthal.
CO2	:	r_f';fSf;fpilna cs;s bkhHpfschy; Vw;gl;l Vw;wj;jhH;itf; fisa cjt[jy;. Samoogangalukkidaie ulla mozhigalal erpatta ettrathazhvai kalaiya uthavuthal.
CO3	:	,UbkhHp/ gd;bkhHp nfhl;ghLfis cUthf;Fjy;. Irumozhi, panmozhi kotpadugalai uruvakkuthal.
CO4	:	bkhHp fyg;gpypUe;J jha; bkhHpia kPl;LUthf;fk; bra;jy;. Mozhi kalappilirinthu thaai mozhiyai meeturuvakkam seithal.
CO5	:	rKjha mwpita[k;/ jha;bkhHp gw;wpa tpHpg;g[zh;ita[k; tsh;j;jy;. Samudhaya arivaiyum, thamizhmozhi patriya vizhipunarvaiyum valarthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	3	2
CO2	3	3	2	2	2
CO3	3	3	3	3	3
CO4	2	2	2	2	2
CO5	3	2	3	3	2
AVERAGE	2.6	2.6	2.4	2.6	2.2

tpUg;gg; ghlk; - I

jhs; : 1 – bkhHpbgah;g;g[

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

76. bkhHp bgah;g;gpd; ,d;wpaikahikia czh;j;jy;.
77. bkhHp bgah;ghsh;fSf;Fhpa njitia czh;j;jy;.
78. nfhl;ghl;L mog;gilapy; bkhHp bgah;g;g[bra;j;y;.
79. mwptpay; Kiwapy; bkhHpbgah;f;ff; fw;wy;.
80. gybkhHp mwptpd; ,d;wpaikahikia vLj;jpak;gy;.

Course Objectives :

76. Mozhipeyarppin indriyamaiyamaiyai unarthuthal.
77. Mozhi peyarppalargalukuriya thevaiyai unarthal.
78. Kotpadu adippadaiyil mozhi peyarppu seithal.
79. Ariviyal muraiyil mozhipeyarkka katal.
80. Palamozhi arivinn indriyamaiyamaiyai eduthiyambal.

myF -1 :

bkhHpbgah;g;g[- tiuaiw - ,d;iwa r_f murpay;/ bkhHp - mwptpay; fy;tp; NHy;fsy; bkhHpbgah;g;gpd; ,d;wpaikahik.

Alagu – 1

Mozhi peyarppu – varaiyarai – indraiya samooga arasiyal, mozhi – ariviyal kalvi soozhalgalil mozhipeyarppin indriyamaiyamai.

myF -2 :

bkhHpbgah;g;ghshpd; jFjpfs; - bkhHpbgah;g;g[mog;gilf; nfhl;ghLfs; - bkhHpbgah;g;g[Kiwfs;.

Alagu – 2

Mozhipeyarppalarin thaguthigal – mozhipearppu adippadai kotpadugal – mozhipeyarppu muraigal.

myF -3 :

bkhHp bgah;g;g[tiffs; - brhy;Yf;Fr; brhy; bkhHp bgah;j;jy; - jGty; fl;lw;w
 bkhHpbgah;g;g[- bkhHpahf;fg; gilg;g[(Transcreation) - ,ae;jpu bkhHpbgah;g;g[
 - bkhHpahf;fk; my;yJ fUj;Jg; bgah;g;g[- bkhHpbgah;g;g[eil - bkhHpbgah;g;gpy;
 vGk; rpf;fy;fSk; mtw;wpw;Fhpa jPh;t[fSk;.

Alagu – 3

Mozhi peyarppu vagaigal – sollukku sol mozhipeyarthal – thazhuval
 kattatra mozhipeyarppu – mozhiyakka padaippu (Trannscreation) – Iyandira
 mozhipeyarppu – mozhiyakkam (or) Karuthu peyarppu – Mozhipeyarppu nadai
 – mozhipeyarppil ezhum sikkalgalum avatrirkuriya theervugalum.

myF - 4:

bkhHpbgah;g;g[j; jpwdha;t[f; TWfs; - _yj;ij Ma;jy; - bkhHpbgah;g;ghshpd;
 bkhHpbgah;g;gpd; _yj;njL xg;gply; - bkhHpbgah;g;ig Ma;jy; - kjpg;gPL - juk;.

Alagu – 4

Mozhipeyarppu thiranaivu koorugal – moolathai ayidal –
 mozhipeyarppalarin mozhipeyarppin moolathodu oppidal – mozhipeyarppai
 aidal – mathipeedu – tharam.

myF - 5:

jkpHpypUe;J M';fpyj;jpYk; M';fpyj;jpypUe;J jkpHpYk; bkhHpbgah;f;f chpa
 gapw;rpfs; jUjy;.

Alagu – 5

Thamizhilirunthu angilathilum, Angilathilirunthu thamizhilum
 mozhipeyarppu uriya payirchigal tharuthal.

ghpe;Jiu E]y;

1. bkhHpbgah;g;g[f;fiy/ K.tsh;kjp/
2. bkhHpbgah;g;gpay;/ R.rz;Kfntyha[jk;/

Recommended Book

1. Mozhi peyarppukkalai, M. Valarmathi.
2. Mozhipeyarppiyal, S. Shanmuga Velayudham.

ghh;it E]y;fs;

1. bkhHpbgah;g;g[fUzhfud;.
2. bkhHpbgah;g;g[k; brhy;yhf;fKk;/ K.fzgjpg;gps;is.
3. bkhHpbgah;g;gpay;/ nrJkzp kzpad;.
4. Allemwend Library and others, 1968, Problems of Translation, All India Poet's Conference. Culcutta.

Reference Books

- 42.Mozhipeyarppu, Karunagaran.
- 43.Mozhipeyarppum, Sollakkamum, M. Ganabathipillai.
- 44.Mozhipeyarppiyal, Sethumanian.
45. Allemwend Library and others, 1968, Problems of Translation, All India Poet's

Conference. Culcutta.

<https://ta.m.wikipedia.org/wiki/%E0%AE%AE%E0%AF%8A%E0%AE%B4%E0%AE%BF%E0%AE%AA%E0%AF%86%E0%AE%AF%E0%AE%B0%E0%AF%8D%E0%AE%AA%E0%AF%8D%E0%AE%AA%E0%AF%81>

<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	bkhHp bgah;g;gpd; tiuaiwiaa[k; ,d;wpaikahikiaa[k; mwpjy;. Mozhi peyarppinn varaiyaraiyaiyum indiyamaiyaiyum arithal.
CO2	:	bkhHp bgah;g;ghsh;fspd; jFjpfisa[kk; bkhHp bgah;g;g[Kiwfisa[k; mwpjy;. Mozhipeyarppalargalin thaguthigalaiyum mozhi peyarppu muraigalaiyum arithal.
CO3	:	bkhHp bgah;g;gpd; tiffisa[k; mjdhy; Vw;gLk; rpf;fy;fisa[k; tps';fpf; bfhs;sy;. Mozhi peyarppin vagaigalaiyum adhanal erpadum sikkalgalaiyum vilangi kollal.
CO4	:	bkhHp bgah;g;gpd; jd;ikia mwpjy;. Mozhi peyarppin thanmaiya arithal.
CO5	:	bkhHp bgah;g;g[j; jpwd; tsh;j;jy;. Mozhi peyarpputhiran valarthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	3
CO2	2	3	2	3	2
CO3	3	3	3	3	3
CO4	2	3	3	2	2
CO5	3	2	2	3	3
AVERAGE	2.6	2.6	2.6	2.6	2.6

**gzpj;njh;tj; jkpH;
Paniththervu Tamil**

Total Hours	:		:	Course Code
Credits	:		:	L.T.P.

nehf;fk; :

81. muRg; gzpahsh;fshf gzpakh;j;jpLk; nehf;fj;jpy; KJfiyj; jkpH; khztpah;f;Fg; ghlj;jpl;lk; cUthf;fg;gl;Ls;sJ.
82. Foa[hpikj; njh;t[f;bfd jkpH; khztpfis Maj;jg;gLj;Jjy; nehf;fk;.
83. nghl;oj; njh;t[fSf;Fhpa jFjpfs;/ tpz;zg;gpf;Fk; Kiwfs;/ Mtz';fs; gjpt[fs; Fwpj;J mwpar; bra;jy;.
a[#p.rp.apd; NET, SET, JRF, TET njh;t[fis KJfiy khztpah; vjph;bfbhz;L gzpj;njh;tpy; btw;wpg;bgw Maj;jg;gLj;Jjy; nehf;fk;.
84. ika muR/ khepy muRj; njh;t[f;fhd ghlj; jpl;l';fspd; tpdh/ tpilfis mikj;Jf; bfhLf;Fk; gapw;rpj; njh;t[fis vGjr; bra;jy;.
85. MSikia tsh;j;Jf; bfhLf;Fk; Kaw;rpapy; neh;Kfj; njh;tpy; g';FbgWk; khztpah;f;F ngr;Rf; fiyapd; Kf;fpaj;Jtj;ijf; fw;Wf; bfhLg;gJ.

Course Objectives :

81. Arasupaniyalargalaga paniyamarthappadum nokkathil muthugalai thamizh manaviyarku padathittam uruvakkapattullathu.
82. Kudiyurimai thervukkena thamizh manavigalai ayathapaduthuthal nokkam.
83. Potti thervugalukuria thaguthigal, vinnppikkum muraigal, avanangal pathivugal kurithu aria seithal. UGC-yin NET, SET, JRF, TET thervugalai muthugalai manaviyar ethirkondu pannithervil vetripetra ayathapaduthuthal nokkam.
84. Maiya arasu, manila arasu thervukkana padathittangalin vina, vidaigalai amaithu kodukkum payirchi thervugalai ezhutha seithal.
85. Alumaiyai valarthu kodukkum muyarchiyil nermuga thervil panguperum manaviyarku pechukalaiyin mukkiyathuvathai katra koduppathu.

myF -1 :

,e;jpa Ml;rpg; gzpahsh;; njh;t[k; mQFKiwa[k; - ,d;iwa NHypy; vjw;fhff; Foa[hpikg;gzpapd; njit - gzpfsdpd; Jiwfs; jpl;lkpLjy; - Kd;ndw;wj;jpw;F _d;Wgofs; - jahhpg;gpy; ehd;F fl;l';fs; - gpujhdj; njh;t[- tpUg;gg;ghl';fisj; njh;e;bJLf;Fk; Kiw - vg;goj; njh;e;bJLg;gJ - EiHtj;

njh;t[- Kjy;fl;l; njh;t[- bghJ mwpt[j;jhs; RHw;rp Kiwapy; gog;gJ - Msikj; njh;t[- ngRk;fiy.

Alagu – 1

Indhiya aatchi paniyaalar thervum anugumuraiym – inraiya suzhalil edharkaaga kudiurimaipaniyin thevai – panigalin thuraigal thittamidudhal – munnetrathirku moonrupadigal – thyaarippil naangu kattangal – pradhana thervu – viruppa padangalai therndhedukkum murai – eppadi therndheduppadhu – nuzhaivu thervu – mudhalkatta thervu – podhu arivuthal suzharchi muraiyil padippadhu – aalumai thervu – pesumkalai.

myF - 2:

a{.#p.rp-apd; NET/ SLET/ JRF njh;tpw;F chpait

ghlj;jpl;lKk; tpdhtpil tpsf;ff; Fwpg;g[fSk;

jhs; I bghJ mwpt[: midj;Jj; Jiw rhh;e;jJ.

jhs; II tpUg;gg; ghk;: Jiwrrhh;e;j jpwdwpt[(50 kjpg;bgz;fSf;fhdJ).

(tpilbjhp tpdhf;fs; ml';fpaJ (Multiple Choice Questions)

Alagu – 2

U G C in NET/ SLET/ JRF thervirku uriyavai

Paadathittamum vinaa vidai vilakka kurippugalum

Thaal I podhu arivu; anaithu thurai saarndhadhu :

Thaal II viruppa paadam: thuraisaarndha thiranaarivu (50 madhippengalukkanadhu)

(vidai their vinakkal adangiyadhu (Multiple Choice Questions)

myF - 3:

xU';fpizf;fg;gl;l rhh;epiyg; gzpfs;: F%g; I -Foikapay; epakdj; jFjpj; njh;t[: jkpHf muRg; gzp rhh;e;j Foikapay; epakdk; Fwpj;j Kjy;fl;l; njh;t[(General Studies Degree Standard) tpil bjhptpdh (Topic for Objective Type Question):

bghJf;fy;tp: cah;epiyf; fy;tpj; jFjp

bghJ mwptpay;: ,aw;gpay; - ntjpapay; - jhtutpay;-tpy';fpay; ghl';fisf; bfhz;ld.

jw;fhy epfH;t[: tuyhW - murpay; - g[tpapay;-bghUspay;-fzpdp bjhlh;ghdit.

Alagu – 3

Orunginaikkapptta saarnilai panigal : I – kudimaiyal nimana thagudhi thrvu : thmizhaga arasu pani saarndha kudimaiyl niyamanam kuritha mudhal katta thervu (General Studies Degree Standard) vidai therivina (Topic for Objective Type Question):

myF - 4:

jkpHf muRg; gzprhh;e;j Foikapay; -
jFjpi; njh;t[Kjy;fl;j; njh;t[- tpilbjhptpdhf;fs;

bghJ mwptpay;: ,aw;gpay; - ntjpapay; - jhtutpay;-tpy';fpay; ghl';fisf;
bfhz;lit.

jw;fhy epfH;t[fs; : g[tpapay; - tuyhW kw;Wk; ,e;jpag; gz;ghL - ,e;jpa
murpay; ,e;jpa bghUspay; -,e;jpa njrpa ,af;fk;-bray;ghLfs; kw;Wk;
Ez; mwpt[j; jFjpi; njh;t[(Aptitude Mental Ability Test)

Alagu – 4

Thamizhaga arasu panisaarndha kudimaiyal_

Thagudhi thervu: mudhal katta thervu – vidai therivinakkal

Podhu ariviyal: iyarpiyal – vedhiyal – thavaraviyal – vilangiyal
paadangalai kondavai.

Tharkala nigazhvugal : puviual – varalaaru matrum india panbadu – india
arasiyal india poruliyal – india dhesiya iyakkam – seyalpaadugal matrum nun
arivu thagudhi thervu.

myF - 5:

Mrphpah; jFjpi; njh;t[(TET) -cstpay;: fy;tpapy; g[Jikfs;/ fy;tpay;
miwTty;fs; (B.Sc., Matric, Government - epWtd';fs; bjhlh;ghd jfty;fs;
ml';fpait - 30 kjpg;bgz;fs; bfhz;lit.

jkpH;: ,sepiyg; gl;l ghlj;jpl;lk; - 30 kjpg;bgz;fs;

M';fpyk; : ,sepiyg; gl;l ghlj;jpl;lk; - 30 kjpg;bgz;fs;

mwptpay; my;yJ r_f mwptpay;: tuyhW-g[tpapay; - Foikapay; (Mwhk;
tFg;g[Kjy; gd;dpbuz;lhk; tFg;g[fSf;Fs;shd ghl';fs; njh;tpw;F vLj;Jf;
bfhs;sg;gLfpwJ(60 kjpg;bgz;fs;).

ghpe;Jiu E]y;fs;:

1. I.V.v!;.btw;wpg; gof;fl;Lfs;/ Mrphpah; bt. ,iwad;g[./ vd;.rp.gp.vr;./
Mwhk; tFg;g[/ brd;id-14.
2. jkpH; bkhHp ,yf;fpa tuyhW/ kh. ,uhrkhzpf;fk;.
3. jkpH; ,yf;fpa tuyhW/ vy;yh Mrphpah;fspd; g[j;jf';fSk;.
4. UGC-NET/SET (JRF & LS) Commerce – Paper II & III, Arihant
Publications (India) Limited. (ISBN No.: 978-93-5094-082-2). New
Delhi, 110002.
5. TNPSC, Group-IV (F%g; IV ifnaL ef;fPud; btspaPL/ rhUgpugh
gphpz;lh;l;/ Kjy;gjpg;g[/ 2016/ brd;id-14. (ISBN: 978-93-85125-31-

- 7).
6. Raman's TNPSC Group IV (VAO – SSLC), The Raman's Books, Adyar, Chennai-600 020.
7. Group II: Raman's One Time (ifnaL 200 tpdhf;fSf;F rhpahf tpilaspj;jy;) TNPSC Q & A. epakdj; njh;t[- 2016. Combined Civil Services – II (xU';fpizf;fg;gl;l rhh;epiyg; gzpfs; - II)
8. ,ilepiy Mrphpah; jFjpj; njh;t[(TET) : fw;wy; kdpj tsh;r;rp bjhlh;ghd cstpay;/ fp.ehfuh#d;/,uhk; gjpg;gfk;/ 74/2/ tpntfhde;jh; bjU/ fhe;jp efh;/ rhyp fpuhkk;/ brd;id-93.

Recommended Book

1. I A S Vetripadikkattugal, Aasiriyar V Iraiyanadu NPH aaraam vaguppu, ch – 14
2. Thamizh mozhi ilakkiya varalaaru M Rajamanickam .
3. Thamizh ilakkiya varalaaru , ella aasiriyargalin puthagangalum.

<http://www.tamilvu.org>

<https://www.winmeen.com/tnpsc-group-2-2a-exam-syllabus-tamil-pdf-download-www-tnpsc-gov/>

<http://www.tnpsc.gov.in/syllabus.html>

gad;fs; : Course Outcome

CO1	:	gs;sp/ fy;Y]hpfspy; gapd;w ghl';fis El;gkhfg; gapYk; tifapy; bjhptpdh/ tphpthd tpdh vd tpdh tpilfis mwpe;J bfhs;tjhy; vspjhf btw;wp bgwyhk; vd;w Kidg;g[[khztpahpilna vHr; bra;jy;;.
		Palli kallorigalil payindra padangalai nutpamaga payilum vagaiyil therivina, virivana vina ena vina vidaigalai arinthu kolvathal elithaga vetri peralam endra munaippu manaviyaridaiye ezha seithal.
CO2	:	,s';fiyg; gl;lk; bgw;wth; TNPSC Group-II, Group-IIA, IAS, IPS nghd;w nghl;oj; njh;t[fis vGjpg; gad; bgWtjhYk;/ njh;r;rp bgWtjhYk; mth;fs; neh;Kfj; njh;tpy; btw;wp bgWth;.

		Ilangalai pattam petravar TNPSC Group-II, Group-IIA, IAS, IPS pondra pottithervugalai ezhuthi payan peruvathalum, therchi peruvathalum avargal nermuga thervil vetri peruvar.
CO3	:	khepy kw;Wk; ika muRj; njh;t[fSf;F tpz;zg;gpf;Fk;nghJ njitahd chpa Mtz';fis Kiwg;gLj;jpf; bfhz;L gjpt[bra;tJk;/ Mtz';fis tpz;zg;gpg;gJ Fwpj;J gapw;rpapidg; bgWfpd;wdh;. Manila mattrum maiya arasu thervugaluku vinnappikkumpothu thevaiyana uriya avanangalai muraipaduthikondur pathivu seivathum, avanangalai vinnappippathu kurithu payirchiyinai perugindranar.
CO4	:	ika muRj; njh;t[/ khepy muRg; gZpj;njh;tpw;fhd tpUg;gg; ghI';fis/ KJfiy; jkpH; khztpahpilna njh;e;bjLf;fj; J]z;Ltjhy; UG, PG ghI;jpl;l';fnshL bra;jpj;jhs; jfty;fs;/ md;whl epfH;t[fs; Fwpj;j bghJ mwpt[j; njly;/ Kaw;rpapy; khztpah; Mh;tk; bfhs;fpd;wdh;. bghJ epfH;t[fSf;fhd tuyhW/ g[tpapay;/ bghUshjhuk;/ murpay; bra;jpfnsL fw;Wf; bfhs;Sk; gapw;rpahy; bghJmwpt[tpdhtpilfis bjhpe;Jf; bfhz;L btw;wp bgWk; tha;g;gpIdg; bgWk; neh;fj;jpidg; bgWfpd;wdh;. Maiya arasu thervu, manila arasu panithervirkana viruppa padangalai, muthugalai thamizh manaviyaridaiye therntthedukka thoonduvathal UG, PG padathittangalodu seithithal thagavalgal, andrada nigazhvugal kuritha pothu arivuthedal, muyarchiyil manaviyar arvam kolgindranar. Pothu nigazhvugalukana varalaru, puviyiyyal, porulatharam, arasiyal seithigalodu katrikollum payirchhiyal pothuarivu vinavidaigalai therinthukondur vetriperum vaippinai perum nokkathinai perugindranar.
CO5	:	KJfiyg; gl;l;kg; bgWk; khztpah; fy;Y]hp nguhrphpah; gZpf;F SLET, NET, njh;t[fisa[k; B.Ed. Koj;jpUf;Fk; jkpH; KJfiy khztpah; TET njh;ita[k;/ Ma;t[[khztpauhf cs;nshh; gy;fiyf;fHf khdpaf; FGtpd; JRF cjtpj;bjhif bgw;W fy;tp fw;ft[k;/ KJfiyg; ghI;jpid Kw;Wk; bjhpe;J El;gkhfg; gapd;why; btw;wp mika[k; vd;w Mnyhridiag; bgWfpd;wdh;. Muthukalai paddam perum maanaviyar kalluri peraachiriyar panikku SLET, NET , Tervugalaiyum B.ED Mudithirukkum tamil muthugalai maanaviyar TET thervaiyum , aayevu maanaviyaraa vullur palkalaikazhaka maaniya kuzhuvin JRF vuthavithogai petru kalvi karkavum , muthukalai paadathinai mutrum therithu

		nutpagam payenral vetri amaiyum yentra alosanaiyai perukkintranar .

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

jhs;: 14: mwptpay; jkpH;

Paper : 14 : Ariviyal Tamil

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

86. mwptpay; jkpH; totj;ij mwpKfk; bra;jy;.
87. jkpHd; giHa ,yf;fpa';fspy; cs;s mwptpay; bra;jpfis mwpKfk; bra;tpj;jy;.
88. mwptpay; g[yj;;jpy; jkpHd; gad;ghL gw;wp mwpe;J bfhs;Sjy;.
89. fiyr; brhw;fis cUthf;f gapw;Wtpj;jy;.
90. mwptpay; jkpGf;fhd ,af;'f';fspd; g';fspg;ig mwpjy;.

Course Objectives :

86. Ariviyal thamizh vadivathai arimugam seithal.
87. Thamizhin pazhaiya ilakkiyangalil ulla ariviyal seithigalai arimugam seivithal.
88. Ariviyal pulathil thamizhan payanpadu patri arinthu kolluthal.
89. Kalaisorkalai uruvakka paiyutruvithal.
90. Ariviyal thamizhukkana iyakkangalin pangalippai arithal.

myF -1 :

gz;ila mwptpay; tuyhW - jkpH;bkhHp tuyhw;wpy; mwptpay;
jkpHpd; g';F - jkpHpy; fiyr;brhy; tsk; - jkpHhpd; kug[rhh; mwptpay;
bjhHpy; El;gk;.

Alagu – 1

Pandaiya ariviyal varalaru – thamizhmozhi varalatril ariviyal thamilin
pangu – tamilil kalaisol valam – thamizharin marapusaar ariviyal tholil nutpam.

myF - 2:

fypj;bjhifapy; rpy mwptpay; - gz;ghl;Lr; bra;jpfs; - kUj;Jth; rufh; -
neug;bgauhf;fk; (r';f fhyk;).

Alagu – 2

Kalithogaiyil sila ariviyal – Panpaatu seithigal – maruthuvar saragar –
nerrapeyaraaakam (Sanga Kaalam).

myF - 3:

fhye;njhWk; mwptpay; - jkpH;tHp mwptpay; fy;tp - mwptpay;
bkhHp bgah;g;g[tuyhW - ghujpa[k; mwptpay; jkpGk;.

Alagu – 3

Kaalndhorum ariviyal – thamizhvali ariviyal kalvi – ariviyal mozhi
peyarppu varalaru – bharathiyum ariviyal thamizhum.

myF - 4:

fiyr; brhy;yhf;fKk; mwptpay; jkpH; mikg;g[k; - fiyr;brhy;yhf;ff;
nfhl;ghLfs; - fiyr;brhy;yhf;fj;jpy; rKjha czh;t[- mwptpay; ,yf;fpaj; jkpHhf;fk;
- mwptpay; jkpHpy; ,d;iwa njit.

Alagu – 4

Kalai sollakkamum ariviyal tamil amaippum – kalaisollaga koattpaadugal
– Kalaisollakkathil samudhayam unarvu – ariviyal ilakkiya thamizhkam –
ariviyal thamizhil indraiya thevai.

myF - 5:

jkpH; tHp mwptpay; gug;gjypy; mwptpay; ,af;f';fspd; g';fspg;g[-
jkpHpy; FHe;ijfSf;fhd mwptpay; E]y;fs; - mwptpay; jkpH;g; gilg;ghf;fKk;
gutyhf;fKk;.

Alagu – 5

Thamizh vali ariviyalparappudhalil ariviyal iyankkangalin pangalippu –
thamizhilil kulaindhaikalukkana ariviyal noolgal – ariviyal thamizh
padaippaakamum paravalaakamum.

ghpe;Jiu E]y;

1. mwptpay; jkpH;/ lhf;lh;. th.br. FHe;ijrhkp/ ghujp gjpg;gfk;/ jp.efh;/
brd;id-17.
2. mwptpay; jkpHhf;fk;/ lhf;lh;.br.it.rz;Kfk;/ epa{ br";Rhp g[f; At[!;
(gp)ypl;./ mk;gj;J]h;/ brd;id-98.

Recommended Book

1. Ariviyal thamizh , DR . V.S.Kulaindhaisaami , bharathi pathippagam ,
T.Nagar, Chennai – 17.
2. Ariviyal Tamizhaakam, DR. S. V. Sanmugam, New Senjuri Book
House(P) Ltd., Ambathur, Chennai – 98.

ghh;it E]y;fs;

11. mwptpay; brk;bkhHp/ bey;iy R.Kj;J/ kzpthrfh; gjpg;gfk;/ ghhpKid/ brd;id-108.
12. jkpH; tsh;f;Fk; mwptpay;/ ,uhk.Re;juk;/ epa{ br";Rhp g[f; At[!; (gp)ypl;./ mk;gj;J]h;/ brd;id-98.
13. tpaf;f itf;Fk; jkpHh; mwptpay;/ khj;jis nrhK.
14. ,e;jpa mwptpay; mwp"h;fs;/ bt.rhkpehj rh;kh.

Reference Books

- 46.Ariviyal Semmozhi, Nellai S. Muthu, Manivaasagar Pathippagam, Parrys, Chennai – 108.
- 47.Tamizh Valarkum Ariviyal, Rama. Sundaram, New Senjuri Book House (P) Ltd., Ambathur, Chennai – 98.
- 48.Viyakka Vaikum Tamizhar Ariviyal, Maathalai Somu.
- 49.India Ariviyal Arinjargal, V. Saaminaatha Sarma.

<https://www.youtube.com/watch?v=lWuAMJwuatQ>

<https://www.youtube.com/watch?v=xwyvkMIZbaE>

<https://www.youtube.com/watch?v=4TnuXrcroXk>

<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	g[jpa fiyr;brhw;fis cUthf;Fjy;. Puthiya kalaisorkalai uruvakkuthal.
CO2	:	gHe;jkpHpy; fhzg;;gLk; mwptpay; jkpH; mwpe;J g[jpa bkhHp totpid Mf;fk; bra;jy;. Pazhanthamizhil kanapadum ariviyal thamizh arinthu puthiya mozhi vadivinai aakkam seithal.
CO3	:	mwptpay; jkpHpd; njita[zh;e;J g[jpa jkpiH cUthf;Fjy;. Ariviyal thamizhin thevaiunarntu puthiya thamizhai uruvakkuthal.
CO4	:	brhy; tsk; (Vocabulary) bgUf;Fjy;. Solvalam (Vocabulary) perukkuthal.
CO5	:	bkhHpia etPd kakhf;fy;. Mozhi naveena mayamakkal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	2
CO2	3	3	3	3	3
CO3	2	2	3	3	2
CO4	2	2	2	2	2
CO5	2	3	2	2	2
AVERAGE	2.2	2.6	2.6	2.4	2.2

**jhs;: 13 : Xg;gpyf;fpak;
Paper : 13 : Oppilakkkiyam**

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

91. ntw;WbkhHp ,yf;fpa mwpKfk;.
92. giHa kw;Wk; g[jpa ,yf;fpa tot';fis mwpjy;.
93. gilg;g[fspd; fUg;bghUs;; kw;Wk; cj;;jpfis mwpKfk; bra;jy;.
94. Xg;gpLk; tpjp mwpjy;.
95. g[jpa ,yf;fpaf; bfhs;iffis bjhpe;J bfhs;sy;.

Course Objectives :

91. Vetrumozhi ilakkiya arimugam .
92. Pazhaiya matrum pudhiya vadivangalai aridhal .
93. Padaippugalin Karuppugal matrum uthikalai arimugam seidhal .
94. Oappidum vithi aridhal.

95. Pudhiya ilakkiya kolkaikallai therindhu kollal.

myF : 1 : xg;gpay; mwpKfk;

,yf;fpa xg;gha;tpay; mwpKfk; - njhw;wKk;/ tsh;r;rpak; - xU bkhHp/
gd;bkhHp xg;gPL - tuyhW/ tz;zid neh;fpy; xg;gPL - ,yf;fpa xg;gha;tpd;
gy;tifg; nghf;Ffs; - gad;fs; - rKjhaKk; ,yf;fpaKk; - ehl;Lg;g[w ,yf;fpaKk;
Vl;oyf;fpaKk; - ,yf;fpa tifg;ghL.

Alagu -1

Ilakkiya oppaiviyal arimugam – Thotrammum , valarchiyum – oru mozhi
, Panmozhi oppidu – varalaru , vananai nokkil opeedu – Ilakkiya opaaivin
palvagai poakkugal – payangal – samudhayamum ilakkiyamum – naatuppura
ilakkiyamum yettilakkiyamum – ilakkiya vagaippadam .

myF :2: xg;gpay; neh;fpy; ,yf;fpa';fs;

,aw;ifg; ghly;fs; - tPua[fg; ghly;fs; - nghw;wp/ jd;Dzh;r;rp; ghly;fs; -
ifaWepiyg; ghly;fs; - fhjw;ftpijfs; - fhg;gpag; ghly;fs; - ehlf; ghly;fs; - gf;jpg;
ghly;fs; - g[Jbre;bewp ,yf;fpa';fs; - tPWzh;r;rp; ghly;fs; - jj;Jtg; ghly;fs;.

Alagu -2

Iyarkai paadalgal – veerayuga paadalgal – Potri , thannunarchi paadalgal
– kaiyarunilai paadalgal – kaadharkavithaigal – kapiyam paadalgal – naadaga
paadalgaal – bakthi paadalgaal – pudhusenneri ilakkiyangal – veerunarchi
paadalgal – thathuvappadalgal.

myF : 3 : xg;gpay; neh;fpy; cj;jpfs;

m';fjg; ghly;fs; - ftpijapy; Fwpg;g[g; bghUs; - ,iwr;rp/ cs;Siw - ,iwr;rp/
bjhdp xg;gPL - eil - ,yf;fpa cj;jpfs; - khw;W tot';fSk;/ kPl;LUthf;fKk;.

Alagu -3

Angadha paadalagal – kavidhayil kurippu porul – iraichi – ulluraio –
iraichi , Thoni opeedu – nadai – ilakkiya uthigal – mattru vadivangalum ,
meetturuvaakkamum.

myF :4: xg;gPLfs;

fhpfhyDk; mr;rp;yrk; - mjpakhDk;/ bAf;lUk; - ts;StKk; cyf ePjp
,yf;fpa';fSk; - fk;gDk; kpy;lDk; - jpUg;ghita[k; jpUbt;ghita[k; - rpj;jh;fSk;
jhnthapfSk; - rpt thf;fpaKk; ntkz;zht[k; - ghujpa[k; nkiyehl;Lf; ftp'h;fSk;.

Alagu -4

Karigalanum achillasum – Adhiyamanum, Hektarum – Valluvamum ulaga
needhi ilakkiyangalum – kambanum mildanum – Thiruppavaium
Thiruvembaavaium – sithargalum dhaavoigalum – siva vakkiyamum
vemannaavum – bharathium melainattu kavinjargalum .

myF :5: xg;gpyf;fpaf; nfhl;ghLfs;

,yf;fpaf; nfhl;ghLfs; fpHf;Fk; nkw;Fk; - fhuz fhhpaf; nfhl;ghL - Th;jywf;
nfhl;ghL - mof;fUj;Jf; nfhl;ghL - gpbu";Rf; nfhl;ghLk; mbkhp;ff; nfhl;ghLk;.

Alagu -5

Ilakkiya kotpadugal kizhakkum metkum – kaarana kaariya kotpadu – koordhalara kotpadu – adikkaruthu kotpadu – frech kotpadum America kotpadum .

ghpe;Jiu Ely;

1. xg;gpyf;fpa mwpKfk;/ jkpHz;zy;.
2. ,yf;fpa xg;gha;t[/ tp.kp. "hdg; gpufhrk;/ f.g. mwthzd;.
1. oppilakkiya arimugam , Thamizhannal.
2. Ilakkiya oppaivu , V . Me . Gana prakasam, K.P. Aravaanan.

Recommended Book;

15. ,yf;fpa xg;gha;t[/ fs';fs;/ #hd; rhKnty;.
16. fk;gDk; kpy;IDk;/ vd;.,uhkfpU\;zd;
17. r';f ,yf;fpa xg;gPL/ jkpHz;zy;.
18. xg;gpay; ,yf;fpak;/ ifyhrjgp.
19. xg;gpay; neh;fpy; r';f fhyk;/ fjph;. kfhnjtd;

Reference Books

50. Ilakkiya oppaivu kalangal , Jaan Samuvel.
2. Kambanum, Miltonum, N. Ramakrishnan.
- 3 Sanga ilakkiya oppidu, Thamizhannal.
- 4 Oppiyal ilakkiyam , Kailaasapathi .
- 5 Oppiyal nokkil sanga kaalam , Kdhir Mhadevan

<http://www.tamilvu.org>

<http://www.poornachandran.com/%E0%AE%A4%E0%AE%AE%E0%AE%BF%E0%AE%B4%E0%AE%BF%E0%AE%B2%E0%AF%8D-%E0%AE%92%E0%AE%AA%E0%AF%8D%E0%AE%AA%E0%AE%BF%E0%AE%B2%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AE%BF%E0%AE%AF%E0%AE%AE%E0%AF%8D/>

<https://www.msuniv.ac.in/Download/Pdf/fffc0468bc244a2>

gad;fs; : Course Outcome

CO1	:	xg;gpay; neh;fpy; ,yf;fpa tifg;ghLfis mwpjyhy; g[[J ,yf;fpa tiffis cUthf;Fjy;. Oppiyal noakkill ilakkiya vagaippadugalai aridhalal pudhu ilakkiya vagaigalai uruvaagudhal .
CO2	:	,yf;fpa ju;j;ij nkk;gLj;j tHp bra;jy;. Ilakkiya thandhai mempadutha vazhi seidhal.
CO3	:	gilg;gpd; ikak; gw;wpa khw;Wr; rpe;jidia cUthf;Fjy;.

		Padaippin maiyam patriya maatruchindhanaiai uruvakkudhal.
CO4	:	bjhd;ikia tiuaWj;jy;. Thonmaiya varaiyaruthal.
CO5	:	g[jpa ,yf;fpaf; nfhl;ghLfSf;F tpj;jply;. Pudhiya ialakkiya kotpaadugalukku vithidal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	2	3	2	3	2
CO3	3	2	3	2	3
CO4	3	3	2	2	2
CO5	3	3	3	3	3
AVERAGE	2.8	2.8	2.6	2.6	2.6

**bjhy;fhg;gpak; - brhy;yjpfhuk;
Tholkappiyam - Sollathigarm**

Total Hours	:		:	
Credits	:		:	
			L.T.P.	

nehf;fk; :

96. brhy;ypd; cUthf;fk; kw;Wk; ghFghLfis mwpar; bra;jy;.
97. ntw;Wik cUg[fisf; bfhz;L ty;ypdk; kpFk;/ kpfh ,l';fisr;
Rl;of;fhl;Ljy;.
98. brhw;fisg; gphpj;jwpar; bra;jy;.
99. tHf;fpy; tH';Fk; brhw;fisg; gphpj;jwpaf; fw;Wf;bfhLj;jy;.
- 100.brhy;ypyf;fzf; nfhl;ghLfis tpsf;fpf; TWjy;.

Course Objectives :

96. Sollin uruvakkam mattrum pagupadugalai ariya seithal.
97. Vetrumai urubugalai kondu vallinam migum, miga idangalai suttu kattuthal.
98. Sorkalai piriththariya seithal.
99. Vazhakkil vazhangum sorkalai piriththariya katrukoduththal.

100.Sollilakkana kotpadugalai vilakki kooruthal.

myF -1 :

fpstpahf;fk;

ntw;Wikapay;

Alagu – 1:

Kilaviyakkam

Vettrumaiyiyal

myF -2 :

ntw;Wik ka';fpay;

tpsp kug[

Alagu – 2:

Vettrumai mayangiyal

Vili marabu

myF -3 :

bgahpay;

tpidapay;

Alagu – 3:

Peyariyal

Vinaiyiyal

myF - 4:

,ilapay;

chpapay; - I (1 – 50 ghly;fs;)

Alagu – 4:

Idaiyiyal

Uyiriyal-I (1-50 Padalgal)

myF - 5:

chpapay; - II(51 – 99E]w;ghf;fs;)

vr;rtpay;

Alagu – 5:

Uyiriyal-II (51-99 Padalgal)

Echaviyal

ghpe;Jiu E]y;:

bjhy;fhg;gpak; - brhy;yjpfhuk;/ bjhy;fhg;gpah;/ irtrpj;jhe;j E]w;gjpg;g[f; fHfk;/ brd;id-18.

Recommended Books

Tholkappiyam – Sollathigaram, Tholkappiyar, Saiva Sidhantha Noor Pathippu Kazhagam, Chennai-18.

ghh;it E]y;fs;

1. bjhy;fhg;gpak; - brhy;yjpfhuk;/ K.rz;Kfk;gps;is (v.M).
2. bjhy;fhg;gpak; - brhy;yjpfhuk;/ r.nt.Rg;gpukzpak; (g.M).
3. bjhy;fhg;gpak; - brhy;yjpfhuk;/ F.Re;ju_h;j;jp (v.M).
4. brhy;ypyf;fzf; nfhl;ghL - br.it.rz;Kfk;.
5. bgah;r;brhy;/ ,ilr;brhy;/ chpr;brhy;/ tpidr;brhy; - N.,Runay;

Reference Books:

1. Tholkappiyam – Sollathigaram, M. Shanmugampillai (E.A).
2. Tholkappiyam – Sollathigaram, S.V. Subramaniam (P.A.)
3. Tholkappiyam – Sollathigaram, K. Sundaramoorthy (E.A.)
4. Sollilakanak kotpadu – S.V. Shanmugam
5. Peyarchol, Idaichol, Urichol, Vinaichol – S. Isurayel.

<https://www.youtube.com/watch?v=TTu2Dsji5Vo>
<https://www.youtube.com/watch?v=IacWD6zV1ro>
<https://www.youtube.com/watch?v=dpV-68RgupI>
<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	brhw;fspd; cUthf;fk; kw;Wk; ghFghLfis mwpe;J bfhs;Sjy;. Sorkalin uruvakkam matttrum pagupadugalai arinthu kolluthal.
CO2	:	ntw;Wik cUg[fisf; bfhz;L ty;ypdk;/ kpFkplk;/ kpfhtpl';fis czh;e;J gad;gLj;Jjy;. Vetrumai urubugalai konu vallinam, migumidam, migavidangalai unarnthu payanpaduththuthal.
CO3	:	brhw;fspd; ghFghLfis g[hpe;J vGjg; gHFjy;. Sorkalin pagupadugalai purinthu ezhutha pazhaguthal.
CO4	:	tHf;fpy; tH';Fk; brhw;fisg; gw;wp Muha;jy;. Vazhakkil vazhangum sorkalai patri araidhal.
CO5	:	brhy;ypyf;fzf; nfhl;ghLfisg; gphpj;jwpe;J gad;gLj;j Kw;gLjy;.

		Sollilakkana kotpadugalai piriththarinthu payanpaduththa murpaduthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	2	3	2	3
CO3	3	2	3	2	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	2.6	3	2.6	3

tpUg;gg; ghIk; - I

jhs; : 1 – fzpdpapd; gadghL

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

- 101.fzpdpapd; mikg;g[kw;Wk; mjd; tsh;r;rp epiyia mwpar; bra;jy;.
- 102.fzpdp bkhHpfisa[k;/ epuy; cUthf;fj;ija[k; mwpar; bra;jy;.
- 103.,ae;jpu bkhHpbgah;g;g[/ fzp mfuhjpapay;/ bkhHpapay; brhy; gphpg;ghd; nghd;wtw;iw mwpar; bra;jy;.
- 104.bkhHp nehf;fpy; fzpdpapd; Ma;tpid mwpar; bra;jy;.
- 105.jkpHpy; cs;s brhw;fis gpiHapd;wp mikf;f cjt[gth;fis mwpar; bra;jy;.

Course Objectives :

- 101.Kaniniyinn amaippu mattrum adhan valarchi nilaiyai ariya seithal.
- 102.Kanini mozhigalaiyum, niral uruvakkathaiyum ariya seithal.
- 103.Iyandira mozhipeyarppu, kani agarathiyiyal, mozhiyiyal sol pirippan pondravatrai ariya seithal.
- 104.Mozhi nokkil kaniniyin ayivinnai ariya seithal.
- 105.Thamizhil ulla sorkalai pizhaiyindri amaikka uthavubavarkalai ariya seithal.

myF -1 :

fzpdp - bghJ mwpKfk; - fzpdp tuyhW - td;bghUSk; bkd;bghUSk; (Hardware and Software) - fzpdpapd; mikg;g[r; bray;ghL - fzpdpapd; ,d;iwa tsh;r;rp.

Alagu – 1

Kanini – Poothu arithal – Kanini varalaru – Vanpoorulum Menpoorulum (Hardware and Software) – Kaniniyen amaippu seyalpaadu – Kaniniyen intriya valarchi .

myF -2 :

fzpdp bkhHpfSk; epuy; cUthf;fKk; (Computer Language & Programming) ,ae;jpu bkhHp - fl;L bkhHp - cah;epiy bkhHp - bkd;bghus; epuy; cUthf;fk; (Software Programming) - braw;ghl;L bkd;bghUs; (System Software) - gad;ghl;L bkd;bghUs; (Application Software) - gy;Y]lfk; (Multimedia)- ,izak; (Internet) - kpd;d";ry; (E-mail) - fzpdpapd; Vida gad;ghLfs;.

Alagu – 2

Kanini mozhigalum niral Uruvaakkamum (Computer Language & Programming) iyanthira mozhi – Kadda mozhi – Uyarnilai mozhi – Menpooral niral Uruvaakkam (Software Programming) Seyarpaaddu Menpoorul (System Software) – Payen paddu Menpoorul (Application Software) – Palludagam (Multimedia) – Inaiyam (Internet) – minnaggal (E-mail) – kaniniyen Yeenaiya Payen paddugal .

myF -3 :

fzpdp bkhHpapay; (Computer Linguistics) - ,aw;if bkhHpfs; (Natural Language Processing (NLP) - ,ae;jpu bkhHpg;bgah;g; [(Machine Translation) - fzpdp mfuhjpapay; (Computational Lexicography) - bkhHpapay; (Corpus Linguistics) - brhy; gphpg;ghd; (Parser).

Alagu – 3

Kanini mozhiyeyal (Computer Linguistics) – Iyergai mozhigal (Natural Language Processing (NLP) – Inthira mozhippeyerppu [(Machine Translation) – kanini akaraathiyeyal (Computational Lexicography) – mozhiyeyal (Corpus Linguistics) – sol birippaan (Parser) .

myF - 4:

xsptHp vGj;Jg; gog;ghd; (Optical Character Recognize) - Fuy; mwpthd; (Voice Recognizer) - fzpdp neh;fpy; bkhHp Ma;t[- bkhHp neh;fpy; fzpdp Ma;t[- braw;if mwpt[j; jpwd; - fzpdp ,yf;fpak;.

Alagu – 4

Olivazhi yezhuthu padipaan (Optical Character Recognize) – Kural arivaan (Voice Recognizer) – Kanini nookkil mozhi Aayevu – mozhi nookkil kanini aayevu – Seyarkai arivu thiran – kanini ilakkiyam .

myF - 5:

jkpH;r; brhy;yhsh; - brhy;yhshpy; ,lk;bgWk; bkhHp; fUtpfs; brhw;gpiH jpUj;jp - re;jpg;gpiH jpUj;jp - ,yf;fzg;gpiH jpUj;jp - gy;ntW mfuhjpfs; - brhy;yilt[- mfuthpirg;gLj;jy; - Vida bkhHp;fUtpfs; - gf;ftotikg;g[- ,ilbtsp mik;jy; - gj;jp totikg;g[- vGj;JU glk;/ ml;ltiz ,iz;jy; - nfhL nghd;wit tiujy; - milg;g[g; bgl;o cUthf;Fjy; - mof;Fwp vz;zply; - bghl;oly; - mr;rpLjy;.

Alagu – 5

Tamil sollalar – sollalaril idamperum mozhi karuvigal sorbizhai thiruthi – Santhibbizhai thiruthi – Ilakkanambbizhai thiruthi – Palveru akaraathigal – siolladaivu – akaravarisaippaduthal – Yenaiya mozhikkaruvigal – pakkavadivamaippu – Idaiveli amaithal – pakthi vadivamaippu – yezhuthuru padam , Addavanai yenaithal – kodu ponravai varaithal – adaippu peddi uruvaakkuthal – adikkuri yennidal – pooddidal – achiduthal .

ghh;it E]y;fs; :

1. ,aw;if bkhHp Ma;t[Rg;igahg;gps;is/
2. ,z;l;bel;/ R#hjh.
3. fzpg;bghwp mwpKfk;/ bt.fpU\;z_h;j;jp/
4. fw;gfk; g[j;jfhyak;/ fzpdp fiyr;brhw;fs; -
5. Introduction to Computer Science,Xavier.
6. Introduction to Computer, Rajaram.
7. An Introduction to Natural Language Processing through Prolog, Mathews C.

Reference Books

- 51.Eyargai mozhi aayvu , Subbaiyappillai ,
- 52.Internet , Sujatha .
- 53.Kanippori arimugam , Ve . Krishnamoorthi ,
- 54.Karpagam puthagaalayam , kanini kalaisoorkal .
55. Introduction to Computer Science , Xavier.
- 56.Introduction to Computer , Rajaram.
- 57.An Introduction to Natural Language Processing through Prolog , Mathews C.

<https://www.youtube.com/watch?v=6-C9rBvCO0E>
<https://www.youtube.com/watch?v=kdYPGbEm4uA>
<https://www.youtube.com/watch?v=x3QziulMzKk>
<http://www.tamilvu.org>

gad;fs; : Course Outcome

CO1	:	fzpdpapd; td;bghUs;/ bkd;bghUs; bray;ghL Fwpj;J mwpe;J bfhs;sy;. Kaniniyin vanporul, menporul seyalpaadu kurithu arinthu kollal.
CO2	:	,izak; thapyhf gy;ntW Jiw rhh;e;j bra;jpfis mwpe;J bfhs;sy;. Inaiyam vayilaga palveru thurai sarntha seithigalai arinthu kollal.
CO3	:	fzpdpapd; gy;ntW bkhHp tiffis mwpe;J bfhs;sy;. Kaniniyin palveru mozhi vagaigalai arinthu kollal.
CO4	:	fzpdpapd; _yk; bkhHpbghah;g;g[vspjhf cs;sij bjhpe;J bfhs;sy;. Kaniniyin moolam mozhipeyarppu elithaga ullathai therinthu kollal.
CO5	:	fzpdpg; gad;ghl;oy; gf;ftotikg;g[/ gj;jp totikg;g[/ vGj;JU ml;ltizg;gLj;jy;/ mof;Fwp ,ly; nghd;wtw;iw bjhpe;J bfhs;sy;. Kaninipayanpattil pakkavadivamaippu, pathi vadivamaippu, ezhuthuru attavanaipaduthal, adikkuri idal pondravattrai therinthu kollal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	3	3	3	3	3
CO3	2	2	3	3	2
CO4	3	2	2	3	3
CO5	2	2	3	3	2
AVERAGE	2.6	2.2	2.6	2.8	2.1

**tpUg;gg; ghIk; : Clftpay;
Viruppa Padam : Oodagaviyal**

Total Hours	:		:	
Credits	:	Course Code	:	L.T.P.

nehf;fk; :

- 106.Cl'f;fspd; ghpzhk tsh;r;rpia/ Cl'f;fspd; njitia czh;j;Jjy;.
- 107.Cl'f;fisg; gad;gLj;j/ gad;bfhs;s gapw;Wtpj;jy;.
- 108.Cl'f; Jiwfspy; gzptha;g;g[[bgw khzhf;fpah;fisj; jahh; gLj;Jjy;.
- 109.jfty; bjhlh;;g[rhjd';fs; kf;fshl;rpapy; Xh; m';fk;. cs;ehl;L/ btspehl;L bra;jpfissg; bgWk; Kiwfisg; gapw;Wtpj;jy;.
- 110.;jH;fs;/ thbdhyp/ bjhiyf;fhl;rpf;F vGJk; Kiwfis vLj;Jiuj;jy;.

Course Objectives :

- 106.Oodagangalin parinama valarchiyai, oodaganngalin thevaiyai unarthuthal.
- 107.Oodagangalai payanpadutha, payankolla payitruvithal.
- 108.Oodaga thuraiyil panivaippu pera manakkiyargallai thayar paduthuthal.
- 109.Thagaval thodarbbu sadanangal makkalatchiyil oor angam. Ulnattu, velinattu seithigalai perum muraigalai payirtuvithal.
- 110.Idhazhgal, vanoli, tholaikatchi ezhuthum muraigalai eduthuraithal.

myF -1 :

kf;fs; jftypay; mwpKfk; - jd;ika[k; - vy;iya[k; - jfty; bjhlh;g[tpsf;fk; - bray;Kiw - gj;jphpf;ifj; Jiwapd; mog;gilf; bfhs;iffs; - gj;jphpifj; Jiwapdh;f;Fj; njitahd jFjpfs; - gj;jphpifj; Jiwapd; bjHpy; mk;r';fs; - gj;jphpifj;Jiw/ kf;fshl;rpapd; Xh; m';fk; - gj;jphpf;if Xh; Mw;wy;kpf;r_fr; rf;jp - gj;jphpifapd; flikfSk;/ rYiffSk; - kf;fs; bjhlh;g[rhjdk; - thbdhyp epfH;r;rpfs; - thbdhyp tpjpfs; - jpiug;gl';fs; - bjhiyf;fhl;rp epfH;r;rpfs;.

Alagu – 1

Makkal thagavaliyal arimugam-thanmaiyeum-ellaiyeum – thagaval thodarbu vilakkam – seyalmurai – pathirikkai thuraiyin adippadai kolgaigal – pathirikkai thuraiyinarkku thevaiyana thaguthigal – pathirikkai thuraiyin thozhil amsangal – pathirikkai thuraii, makkalatchi oor angam – pathirikkai oor atralmikka samooga sakthi – pathirikkaiyin kadamaigalum salugaigalum – makkal thodarbu sadhanam – vanoli nigazhchigal – vanoli veedhigal – thiraipadangal – tholaikatchi nigazhchigal.

myF -2 :

,jHpay; tuyhW/ bjhlff; fhyk; - jkpH; ,jHpay; tuyhW - ,jH;fspd; tiffs; - ,jHpay; rl;l';fs; - bra;jpr; nrhpg;g[k; brk;ikahf;fKk; - bra;jp Mrphpah;fs;/ Jiz Mrphpah;fspd; bghJthd gzpfs; - btspehl;L/ cs;ehl;Lr; bra;jpfisg; bgWk; Kiw - miye;J jpul;Lk; bra;jpfs; - bra;jpfis neh;g;gLj;Jjy;.

Alagu – 2

Idhazhiyal varalaru, thodakka kalam – thamizh idhazhial varalru – idhazhgalin vagaigal – idhazhiyal sattangal – seithi segarippum semmaiakkamum – seithi asiriyargal, thunai asiriyargalin pothuvana panigal – velinattu, ulnattu seithigalai perum murai – alainthu thirattum seithigal – seithigalai nerpaduthuthal.

myF -3 :

gf;jp mikj;jYk;/ epWj;jf; FwpaplYk; - bkhHp eilf;Fwpg;ngL - bra;jp vGjg;gLk; Kiw - jiyg;g[tiffs; - fpis thp - nijp thp - Kft[iu tiffs; - cly;gFjp - mr;Rg;goj;jpUj;jk; - FwpaPLfs; - ,jHpay; fiyr;brhw;fs; - fl;Liufs; - befph;t[iuufs; - kjpg;g[iu - fUj;Jg;gl';fSk;/ nfyp;r;rpj;jpu';fSk; - thbdhyp/ bjhiyf;fhl;rp;F vGJk; Kiwfs;.

Alagu – 3

Bakthi amaithalum, nirutha kuriyidalum – mozhi nadaikurippedu – seithi ezhuthapadum murai – thalaippu vagaigal – kilai vari – thethi vari – mugavurai vagaigal – udalpaguthi – achupidithirutham – kuriyeedugal – idhazhiyal kalaisorkal – katturaigal – negizhvuraigal – mathippurai – karuthupadangalum, kelichithirangalum- vanoli, tholaikatchikku ezhuthum muraigal.

myF - 4:

tpsk;guj;jpd; jj;JtKk; bray;ghLk; - tpsk;gu mw';fs; - ,e;jpa ehl;oy; tpsk;gu';fs;.

Alagu – 4

Vilambarathin thathuvamum seyalpadum – vilambara arangal – India nattil vilambarangal.

myF - 5:

kf;fs; cwtpay;/ brhw;bghUs; tpsf;fKk;/ tiuaiwa[k; - tpsk;guKk; bghJkf;fs; bjhlh;g[k; - murh';fKk; kf;fs; bjhlh;g[Kiwfsk; - jpl;lkljy; - Kot[bra;jy; - kf;fs; bjhlh;g[rhjd';fs;.

Alagu – 5

Makkal uraviyal, sorporul vilakkamum, varaiyaraigalum – vilambaramum pothumakkal thodarbum – arasangamum makkal thodharbu muraigalum – thittamiduthal – mudivu seithal – makkal thodharbu sadanangal.

ghpe;Jiu E]y;:

1. ,jHpay;/ ,uh.nfhjz;lghzp.
2. jkpH; ,jH;fs;/ nrhkny.
3. ,jHpay; Xh; mwpKfk;/ M.gp. me;njhzp ,uhR.
4. Journalism as a Career , Sen Gupta.

- History of Indian Journalism, J. Natarajan.

Recommended Book

- Idhazhiyal, R. Kothandapani.
- Thamizh Idhazhgal, Somale.
- Idhazhiyal Orr Arimugam, A.P. Anthony Rasu.
- Journalism as a Career , Sen Gupta.
- History of Indian Journalism, J. Natarajan.

<https://www.youtube.com/watch?v=i2NJBL7RBAk&t=2s>

https://www.youtube.com/watch?v=xc-fCpFbhjs&list=PLjN-0QkV0mmVZJHF0uwDE_JdqlcNj2M

<http://www.tamilvu.org>

Course Outcome

CO1	:	jft; Clf';fs; gw;wp mwpjy;. Thagaval oodagangal patri arithal.
CO2	:	Clf';fis fy;tp rhh;e;J gad;gLj;Jtjpy; gapw;rp bgWth;. Oodagangalai kalvi sarnthu payanpaduthuvathil payirchi peruvar.
CO3	:	Clf';fs;py; gzptha;g;g[bgWth;. Oodagangalil panivaippu peruvar.
CO4	:	Clf';fspd; ,d;wpaikahik/ bry;thf;F/ jdpr;rpwg;g[gad;ghL Mfpatw;iw vLj;Jiug;gJ. Oodagangalin indriyamaiyamai, selvakku, thanisirappu, payanpadu agiyavattrai eduthuraippathu.
CO5	:	tpsk;guj;jpd; jj;JtKk;/ bray;ghLk; gw;wp mwpe;J bfhs;tJ. tpsk;gu mw';fs;/ ,e;jpa ehl;oy; tpsk;gu';fs; kf;fs; bjhlh;g[rhjd';fs; gw;wpa bra;jpfis bjhp;J bfhs;tJ. Vilambarathin thathuvamum, seyapadum patri arinthu kolvathu vilambara arangal, India nattil vilambarangal makkal thodarbu sadanangal patriya seithigalai therinthu kolvathu.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5

CO1	2	2	2	2	2
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	2	3	3	2
CO5	3	3	3	3	3
AVERAGE	2.8	2.6	2.6	2.8	2.6

QUAID-E-MILLATH GOVT. COLLEGE FOR

**QUAID-E-MILLATH GOVT. COLLEGE FOR WOMEN
(Autonomous)**

Anna salai, Chennai - 600 002.

B. A TAMIL LITERATURE

SYLLABUS



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

OFFERED FROM THE ACADEMIC YEAR 2017-2018

WOMEN
(Autonomous)
Anna salai, Chennai - 600 002.

B.A. TAMIL LITERATURE
SYLLABUS



CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION

OFFERED FROM THE ACADEMIC YEAR 2017-2018

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UAID – E- MILLETH GOVERNMENT COLLEGE FOR WOMEN,
(AUTONOMOUS)
CHENNAI – 600 002

Undergraduate Courses
Choice Based Credit System

Quaid – E- Millath Government College for Women (Autonomous) offers the semester System of Education with credits for UG courses. Credit simply means the weightage given to what is taught and what is learnt. It is normally related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design, Each course is designed variously under lectures/ tutorials/ laboratory work/ seminar/ Practical training etc to facilitate effective teaching and learning and the credits are assigned according, depending on the content and the specialization.

The minimum credit requirement for a three – year UG course shall be 140.

B.A. DEGREE COURSE

RULES AND REGULATIONS

1. Duration

- a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semesters, the second academic year, the third and fourth semesters and the third academic year, the fifth and sixth semesters.
- b. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year.

2. Course of study

The course of study for Bachelor Degree courses shall comprise of the following

Part I & II – Foundation courses

- I. Part- I Tamil
- II. Part II English

Part III

- a. Core Subjects
- b. Allied Subjects

Part IV

- a. Softskill (4 Papers)
- b. Non- Major Elective (2 Papers)
- c. Environmental Studies
- d. Value Education

Compulsory Core Module course in Environmental studies consisting of 2 extra credits, Value education – 2 Credits, Soft skills – 8 Credits (2 credits each). Non-Major elective – 4 credits (2 credits each)

Part V

Compulsory Extension service

A candidate shall be awarded a maximum of one credit for compulsory Extension service. All students shall have to enroll for NSS/NCC/YRC/RRC/Sports and Games/Consumer club/Enviro club/Leo club or any other service organization in the college and shall have to put in compulsory attendance of 40 hours, which shall be duly certified. If a student lacks 40 hours attendance in the First year, she shall have to compensate the same during the subsequent years.

Students who complete the minimum attendance of 40 hours in One Year only will get credit and those who complete the attendance of 80 or more hours in Two years will get 1 credit.

PROGRAMME OUTCOMES

On completion of the Programme, the learner is able to:

1. Apply human values.
2. Identify the subject goals.
3. Formulate creative skills..
4. Acquire Communication Skills and subject knowledge
5. Analyse the responsibilities.

PROGRAMME SPECIFIC OUTCOMES

PSO1: ,yf;fpa/ ,yf;fzk;/ bkhHpapay; TWfis mwpKfg;;gLj;Jjy;.

PSO2: ,yf;fpa/ ,yf;fzk;/ bkhHpapay; TWfis tpsf;fpj; bjspaitj;jy;.

PSO3: ,yf;fpa/ ,yf;fzk;/ bkhHpapay; TWfisr; rhd;whjhu';fnshL xg;gpl;Lf; fhl;Ljy;.

PSO4: ,yf;fpa/ ,yf;fzk;/ bkhHpapay; TWfisj; jw;fhy tHf;fhWfnshL bghUj;jp Muha;e;jwpjy;.

PSO5 : ,yf;fpa/ ,yf;fzk;/ bkhHpapay EQfp Maf; fw;gpj;jy;.

PSO1. Illakkiya, Ill kkanam, Mozhiyeal kurugalai arimuga paduthuthal.

PSO2. Ilaakkiya, Illakkanam, Mozhiyeal kurugalai vilakki theliyavaithal.

PSO3. Illakiya Illakkanam, Mozhiyeal kurugalai saantratharangalodu oppittu kattuthal.

PSO4. Illakkiya, Illakkanam, Mozhiyeal kurugalai tharkkala vazhakkarugyalodu poruthiparthal.

PSO5. Illakkiya, Illakkanam, Mozhiyeal kurugalai nunugii aitharithal.

**bghJj;jkpH;
General Tamil**

gUtk; I – IV
Semester I-IV

2017 – 2018

**QUAID-E-MILLATH GOVERNMENT COLLEGE FOR
WOMEN(AUTONOMOUS)
ANNA SALAI, CHENNAI-02**

DEPARTMENT OF TAMIL

SYLLABUS PARTICULARS

B.A., B.Sc., B.Com – Part I

Kjyhkhz;L

Semester	Components	Title of the paper	Lec/Hrs./Wk.	C.A	S.E.	Total	Credit
I Semester	Part I- Tamil Paper I	bra;a[s; ,yf;fpatuyhW ciueil bkhHpj;jpwd;	6	25	75	100	3
II Semester	Part-I Tamil Paper -II	bra;a[s; ,yf;fpatuyhW rpWfij ,jHpaYk; bkhHpbgah;g;g [k;	6	25	75	100	3

,uz;lhhkhz;L

Semester	Components	Title of the paper	Lec/Hrs./Wk.	C.A	S.E.	Total	Credit
I Semester	Part I - Tamil Paper III	bra;a[s; ,yf;fpatuyhW g[jpdk; brk;bkhHptuyh W	6	25	75	100	3
II Semester	Part-I Tamil Paper -IV	bra;a[s; ,yf;fpatuyhW ehlfr; gilg;ghf;fj; jpwd;	6	25	75	100	3

**Kjyhhk; Mz;L - Kjw;gUtk;
First Year – First Semester**

jhs; : I: bra;a[s;/ ,yf;fpatuyhW/ ciueil/ bkhHpj;jpwd;
Paper: 1 : Seyyul, Ilakkiya Varalaru, Urainadai, Mozhithiran

Total Hours : Course Code :
Credits : L.T.P. :

nehf;fk; :

- 111.jkpHwp"h;fspd; ,yf;fpag; gilg;ghy; r_fj;jpy; gFj;jwpit nt%d;wr;
bra;jy;.
- 112.jkpH; ,yf;fpaj;jpy; jdpj;jkpH; eiliaf; ifahz;L ,yf;fpa';fSf;F tsk;
nrh;j;jy;.
- 113.ftpij/ fl;Liu/ tpz;zg;g';fs;/ mwptpay; fiyrr; brhw;fs; Mfpatw;iw
gpiHapy;yhky; vGj mwpar; bra;jy;.

Course Objectives :

- 111.Tamizhrinjargalin Elakkiya Padaippaal Samugathil Pagutharivai
Verunra seithal.
- 112.Tamizh Elakkiyathil TaniTamizh Nadaiyai Kaiyandu
Elakiyangallukku Valam serthal.
- 113.Kavithai, Katturai, Vinnapangal, Ariviyal Kalaisorkal Aakiyavatrai
Pizhiyellamal Ezhuta Ariya Seithal.

myF : 1

1. ghujpahh; - jkpH;bkhHpthH;j;J - 'thH;fepue;juk;'
2. ghujpjhrd; - cyfk; cd;DilaJ - 'gs;sk; gwpg;gha;'
3. ftpkzp - kUkf;fs;tHpkhd;l;rpak; (nfhnlpwFoKoj;jg; glyk;
Fyf;Fwj;jp..... (5 ghly;)
4. gl;Lf;nfh;l;ilahn; - fhLtpisal;Lk; bghz;nz - 'Rk;khfple;jepyj;ijj; bfhj;jp'
5. fz;zjhrd;-fhyf;fzpj; - 'ftp"d; ahndhh;fhyf; fzpjk;.....'

Alagu – 1

1. Baratiyaar – Tamizhmozhi Vaazhtu – 'Vazhganirantaram'
2. Baarati Tasan – Vulagam Vunnudaiyatu – 'Pallam Paripaai'
3. Kavimani – Marumakkalvazhimaantiyam (Koderikudimuditha
Padalam Kulakurati.....(5 Paadal)
4. Pathukotthaiyaar - Kaaduvelaiyaatum Penne – 'Summa kidanta
nelathai Kotti'
5. Kannathasan – Kaalakanitham – 'Kavinjinan Yaanorkaala
Kanitham.....'

myF :2

1. "hdf;Tj;jd; - cghak; - 'tl;lyhk; gpirayhk;.....'
2. thzpjhrd; - fhL - 'Fztpid.....'
3. kPuh - fdt[fs;+fw;gidfs; = fhfpj';fs; 'cdf;bfd;d.....'
4. rpw;gp - xUfpuhkj;Jejp - 'fy;Yk; fhLk;.....'

5. C.K.re;jpunchfd; - iAf;TbjhFg;g[- ‘my;thj;Jz;Lk; rpy mQ Fz;LfSk;’ 8 ghly;fs;.

Alagu – 2

1. Gnanakuuthan - Vubaayam – ‘ Vatalaam Pisaiyalam.....’
2. Vaanithasan – Kaadu – ‘Kunavenai.....’
3. Meera – Kanavugal+ Karpanaigal = Kaakithangal ‘Vunakenna...’
4. Sirpi – Orukramathunadhi – ‘Kallum Kaadum....’
5. C.K. Sandira Mohan – Hicootoguppu – ‘Aavaatundum sila Anukundugalum’ 8 Paadalgal.

myF : 3 : ,yf;fpatuyhW: ghle;jGtpa ,yf;fpatuyhW

1. 19/ 20Mk; E]w;whz;LjkhH;f;ftp" h;fs;
2. g[Jf;ftpj/ ciueiltsh;r;rp

Alagu – 3

1. 19, 20 Aam Nootrandu Tamizh Kavinjargal
2. Puthukavithai, Vurainadaivalarchi

myF :4

r';fj;Jspfs; - fhapnjcpy;yj; fy;Y]hp - jkhH;j;JiwbtspaPL

Alagu – 4

Sangatuligal – Q – E – Millath College – Tamizhturai Veliyeedu

myF :5

1. brhw;fis mfuthpirapy; mik;jy;
2. gy bghUs; Fwpj;j xU brhy;/ xU bghUs; Fwpj;j gy brhw;fis vGJjy;
3. vGj;Jg; gpiH ePf;fp vGJjy; (y/ H/ s/ u/ w/ z/ e/ d ntWghLfs;)
4. ty;ypdk;kpFk;/ kpfh ,l';fs;
5. bjhlh;g;gpiH ePf;fp vGJjy; (jpiz/ ghy;/ vz;/ ,lk;/ fhykaf;fk; ,d;wpvGJjy;)
6. fiyr;brhy;yhf;fk;
7. gHbkhHpfs;/ kuglj; bjhlh;fisg; gad;gLj;jp thf;fpak; mik;jy;.

Alagu : 5

1. Sorkalai Agaravarisaiyil Amaithal.
2. Palaporul Kuritha Oru Sol, Oru Porul Kuritta Pala Sorkalai Ezhtuthal
3. Ezhutupizhai Neeki Ezhtuthal (La, Zha, Laa, Ra, Raa, Na, Naa, Na, Verubaadugal
4. VallinamMigum, Migaa Edangal
5. Todarpizhi Neeki Ezhituthal, (Tinai, Paal, Ean, Edam, Kaalamayakkam eandri Ezhtuthal)
6. Kalaisollaakam
7. Pazhamozhigal Marabu sorkalai payanpadutti Vaakiyam Amaithal.

ghpe;Jiu E]y;

1. fhapnj kpy;yj; mmuR kfsph; fy;Y]hp (jd;dhl;rp) jkpH;j;Jiwig; nguhrphpah;fshy; bjhFf;fg;gl;l bghJj;jkpH;/ bra;a[s; E]y;.
2. jkpH; ,yf;fpa tuyhW - Kidth;. g.r. VRehjd;.
3. ciueil - r';ff; flypy; Fspj;j Kj;Jf;fs;.
4. bkhHpj;jpwd;/ gad;ghl;Lj; jkpH;/ gapw;rp VL.

Recommended Book

1. Quaid – E – Millath Govt. Womens College (Autonomus) Tamizhturai Perasiriyargalaal Togukkapatta Potu Tamizh, Seyyul Nool.
2. TamizhElakkiya Varalaaru – Munaivar. P. S. Yesunathan.
3. Vurainadai – Sanga Kadalil Kulitta Muthukkal.
4. Mozhitiran, Payanpaatu Tamizh, Payirchi Eadu.

gad;fs; : Course Outcome

CO1	:	ghujpahh;/ ghujpjhrd;/ ftpkzp gl;Lf;nfhil;ilahh;/ fz;zjhrd; nghd;nwhhpd; ftpijfsy; btspg;gLk; tpLjiy/ r_f tpHpg;g[zh;t[/ jkpH;bkhHpg; gw;W Mfpatw;iw mwpe;J bfhs;Sjy;. Baaratiyaar, Baarati thasan, Kavimani Pattukothaiyaar, Kannatasan Pondrorin Kavithaigalil Velippadum Vidutalai, Samuga Vizhipunaryu , Tamilmozhi patru akiyavartri arinthu kolluthal .
CO2	:	ftpijfspd; gy;ntW tot';fisg; gw;wp bjhpe;J bfhs;Sjy;. Kavithaikalin palveru vadivankalai partri therinthu kolluthal .
CO3	:	jha[khdth;/ ts;syhhd; Md;k nea xUikg;ghl;ila[k; g[Jik/ g[ul;rp ftp"h;fspd; r_frPh;jpUj;jk; gw;wpa[k; mwpe;J bfhs;sy;. Thayumanavar , Vallallarin aanma now orumaipataiyum puthumai , puratthi kavinarkalin samukasirithirutham pattriyum arinthu kollal .
CO4	:	r';f ,yf;fpa';fspy; bghjpe;Js;s gy;ntW fUj;Jf;fis mwpar; bra;jy;. Sanga illakkiyakkalin poorthulla palveru karuthukalai ariya siethal .
CO5	:	gpiHapd;wp vGj mwpe;J bfhz;ldh;. Bizhiyenri yezhutha arinthu kondanar .

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5

CO1	2	2	2	2	2
CO2	3	3	3	3	3
CO3	3	2	3	2	3
CO4	2	3	2	3	2
CO5	3	3	3	3	3
AVERAGE	2.6	2.6	2.6	2.6	2.6

,uz;lhk; gUtk; : jhs;:2 - bghJj;jkpH;
 Second Semester : Paper : 4 – General Tamil
 bra;a[s;/ ,yf;fpatuyhW/ rpWfij/ bkhHpj;jpwd;
 Seyyyul, Ilakkiya Varalaru, Sirukathai, Mozhitthiran

bra;a[s; : gf;jp ,yf;fpaKk;/ rpw;wpvf;fpaKk;
Seyyyul: Bakthi Ilakkiyamum, Sitrilakkiyamum

Total Hours : Course Code :
Credits : L.T.P. :

nehf;fk; :

114.irt/ itzt/ fpwpj;Jt/ ,!;yhpka rkar;; rhd;nwhh;fisg; gw;wp mwpar;
 bra;jy;.

115.rpWfijfs; _yk; ,aw;if ts';fisg; ghJfhj;jy; ekJ flik vd;gij czh;j;jy;.

116.ehaf;fh;fhy fiy/ gz;ghl;il ,yf;fpa';fs; tHp czur; bra;jy;.

Course Objectives :

114. Saiva, Vainava, Kristuva, Eslaamiya Samaya Saandrorgalai patri ariya seithal.
115. Serugathaigal muulam Eyarkai Valangalai Paatukaathal namatu kadamai enbathai vunartuthal.
116. Naayakar kaala Kalai, Panbaattai Elakkiyangal Vazhi vunara Seithal.

myF : 1

1. rk;ge;jh; njthuk; - jpUtpHPkpHiyg; gjpfk; (miuahh;tphpnfhtz Mil..... - 11 ghly;fs;)
2. 11-Mk; jpUKiwek;gpahz;lhh; ek;gp - (jpUehiua{h; tpehafh; jpUtpul;ilkzpkhiy - 20 ghly;fs;).
3. kJuftpahH;thh; - fz;zp'Ez;;' rpWjhk;g[- 11 ghly;fs;
4. ek;khH;thh; - jpUthrphpak; - 7 ghly;fs;

Alagu : 1

1. Sambanthar Teavaaram – Thiruvizhimizhalai pathippagam (Araiyaarvirikovana Aadai..... – 11 Paadalgal)
2. 11 – Aam Tirumurainambiyaar nimbi – (Tirunaraiyur Vinayagar Tiruverattaimanimaalai – 20 Paadalgal)
3. Maturakaviyazhvaar – Kanni 'Nun'Sirutambu – 11 Paadalgal
4. Namaazhvaar – Tiruvaasiriyam – 7 Paadalgal.

myF :2

1. fz;zjhrd; - ,naRfhtpak; - (xUthh;j;ijbrhd;dhy; nghJk; (7 ghly;fs;))
2. fhrpk;g[yth; - jpUg;g[fH; (1-59ghly;fs;)
3. ee;jpf;fyk;gfk; (5 ghly;fs;)
 1. ciutuk;gpfe;j (ghly; vz;. 23)
 2. kapy;fz;lhh;.....(ghly; vz;. 25)
 3. Xlhp;fz;.....(ghly; vz;. 29)
 4. jpUtpd;brk;ika[k; (ghly; vz;. 61)
 5. gifapd;wpghh;fhf;Fk; (ghly; vz;. 70)
4. Kf;Tlw;gs;S - gs;spah; Vry; (5 ghly;fs; - 164/ 165/ 166/ 167/ 168).

Alagu: 2

1. Kannathaasan – Easukaaviyam – (Oruvaarthai sonaal Potum – 7 Paadalgal)
2. Kaasimpulavar – Tirupugazh (1 -59 Paadalgal)
3. Nandikkalambagam (5 Paadalgal)
 1. Vuraivarambikanda (Paadal Ean 23)
 2. Mayilkandal....(Paadal Ean 25)
 3. Odarikan.....(Paadal Ean. 29)

4. Tiruvinsemmaiyum (Paadal Ean. 61)
5. Pagaimaiyendripaarkaakum (Paadal Ean. 70)
6. Mukkudatpallu – Palliyar Easal (5 Paadalgal – 164, 165, 166, 167, 168).

myF : 3 : ,yf;fpatuyhW: ghle;jGtpa ,yf;fpatuyhW

1. irt ,yf;fpa';fs; (bghpa g[uhzk; eP';fyhf)
2. itzt ,yf;fpa';fs;
3. rpw;wpyf;fpa';fs;
4. fpwpj;Jth; jkpH;j;bjhZ;L
5. ,Ryhpah; jkpH;j;bjhZ;L

Alagu: 3 : Ilakkiya Varalaru, Padanthazhuviya Ilakkiya Varalaru

1. Seiva Elakkiyangal (Periya puraanam Neengalaga)
2. Vainava Ealakiyangal
3. Setrilakkiyangal
4. Kristavar Tamizhthondu
5. Eslaamiyar Tamizhthondu.

myF :4 : rpWfij

mHfpabghpatd; - rpWfijfs;

1. tz;zj;Jg;g{r;rpfs; gwe;Jtpl;ld.
2. ,iur;ry;
3. jPtphp

Alagu: 4 : Sirukathai

Azhagiya Periyavan - Sirukathaigal

1. Vannattupuuchigal Parantuvittana.
2. Eraichal
3. Teviri

myF : 5 : ,jHpay;

1. ,jGf;Fj; jiya';fk; vGJjy;
2. E]y; kjpg;g[iuvGJjy;
3. tpsk;guk; cUthf;Fjy;
4. ,jHpay; eil
5. neh;fhzy;

Alagu: 5 : Idhazhiyal

1. Ethazhukku Talaiyangam Eazhututhal
2. Nool Matippurai Eazhututhal
3. Vilambaram Vuruvaakuthal
4. Ethazhiyal Nadai
5. Nerkaanal

ghpe;Jiu E]y;fs;;

5. fhapnj kpy;yj; mmuR kfsph; fy;Y]hp (jd;dhl;rp) jkpH;j;Jiwg; nguhrphpah;fshy; bjhFf;fg;gl;l bghJj;jkpH;/ bra;a[s; E]y;.
6. jkpH; ,yf;fpa tuyhW - Kidth;. g.r. VRehjd;.

7. ciueil - r';ff; flypy; Fspj;j Kj;Jf;fs;.
8. bkhHpj;jpwd;/ gad;ghl;Lj; jkpH;/ gapw;rp VL.

Recommended Book

1. Quaid – E – Millath gov. college for Women (Autonomos) Tamil Turai Perrasiriyargalaal Togukkapatta Potutamizh, Seiyul Nool.
2. Tamizh Elakkiya Varalaaru – Munaivar. P. S. Yesunathan.
3. Vurainadai – Sangakadalil Kulitha Muthukkal.
4. Mozhithiran, Payanpaatu Tamizh, Payirchi Eadu.

gad;fs; : Course Outcome

CO1	:	irt/ itzt rkar; rhd;nwhh;fspd; cz;ikahd ,iwj;bjh;oid czh;e;J bfhz;ldh; Seiva Vainava Samaya Saandrorgalin Vunmaiyaana Eeai tondinai Vunartu kondanar.
CO2	:	,!;yhpag; ghly;fSk;/ ,naR fpwpj;Jtpd; nghjidfSk; r_fj;ij ey;tHpg;gLj;Jk; vd;gij mwpe;J bfhz;ldh;. Eslaamiya Paadalgalum, Easu Chistuvina Potanaigalum Samatayathai Nalvazhippaduthum enbathai arintu kondanar.
CO3	:	gf;jp ,yf;fpa';fis ,aw;wpa rkar; rhd;nwhh;fs; r_fj;jpyy; Md;k nea xUikg;ghl;il tsh;j;jdh; vd;gij bjhp;J bfhz;ldh;. Pakthi Ealakiyangalai Eayatriya Samaya Saandrorgal Samugathil Aana Neya Orumaipaatai Valarthanar Eanbathai Terintu kondanar.
CO4	:	mHfpa bghpatd; rpWfijfs; tHp ,aw;ifiag; ngzp ghJfhg;gJ ekJ flik vd;gij mwpe;J bfhz;ldh;. Aazhakiya Periyavan Serukadaigal Vazhi Eayarkaiyai Peni Paatugaapatu Namatu kadamai enbathai arintu kondanar.
CO5	:	,jHpay; gzpf;F khzhf;fpah;fspd; vz;z';fs; ce;jg;gl;Ls;sJ vd;gij czh;e;J bfhz;ldh;. Eathazhiyal Panikku Maanakkargalin Eannangal Vuntapatullatu Enbathai vunartu kondanar.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	2	2	2	2	2
CO3	3	2	2	3	3
CO4	3	3	3	3	3
CO5	2	3	3	3	3
AVERAGE	2.6	2.6	2.6	2.8	2.8

Third Semester

3 : bra;a[s;/ ,yf;fpaturyhw/ g[jpdk;/ brk;bkhHptuyhW

Paper :3: Cheyyul, Ilakkiya Varalaru, Puthinam, Semmozhi Varalaru

Total Hours : Course Code :
Credits : L.T.P. :

nehf;fk; :

- 117.fhg;gpa';fisg; gw;wpa bghJg;ghh;itia cUthf;Fjy;.
- 118.,yf;fpa tuyhw;wpy; ePjpE]y;fspd; Kf;fpaj;Jtj;ij mwpar; bra;jy;.
- 119.xU bkhHp brk;bkhHp Mtjw;Fhpa jFjpfisa[k; tiuuiwfisa[k; tpsf;fpf; TWjy;.

Course Objectives :

- 117.Kaapiyangalai pathiya pothupaarvaiyai vuruvakkuthal.
- 118.Elakiya Varalatrill Neethi Noolgalin mukkiyatuvathai ariya seithal.
- 119.Oru mozhi Semmozhi aavathatkuriya takutigalaiuum varaiyaigalaiuum vilakki kuuruthal.

myF : 1 : bra;a[s; : fhg;gpa';fs; / ePjp ,yf;fpa';fs;

1. rpyg;gjpfhuk; - kJiuf;fhz;lk; - t";rpdkhiy (57 mofs;)
2. kzipnkfiy - cyfmwtpg[f;ff;fhij (98 mofs;)
3. rPtfrpe;jhkzp - ehkfs; ,yk;gfk; (28 ghly;fs;)
4. fk;guhkhazk; - f';ifg;glyk; (28/ 64 ghly;fs;) (bkhj;jk; 37 ghly;fs;)

Alagu – 1

1. Silappathigaram – Maturaikandam – Vanjinamaalai (57 Adigal)
2. Manimegalai – Vulaga arivupukkakathai (98 Adigal)
3. Seevaga sinthamani – Naamagal elambagam (28 Paadalgal)
4. Kambaramayanam – Gangaipadalam (28, 64 Paadalgal) (Motham 37 Paadalgal)

myF :2

1. jpUf;Fws;
(m) mwj;Jg;ghy; - bra;e;ed;wpmwpjy;
(M) bghUl;ghy; - brhy;td;ik
(,) fhkj;Jg;ghy; - ehQj;Jw[t[iuj;jy;
2. btw;wpntw;if (40 mofs;)
3. bgz;kjpkhiy (32 ghly;fs;)
(m) bja;tgf;jp (19 fz;zpfs;)
(M) FUtzf;fk; (5 fz;zpfs;)
(,) khjhgpjhtzf;fk; (8 fz;zpfs;)
4. ghujpjhrd; Mj;jpr;No (84 mofs;)

Alagu – 2

1. Thirukural
(A) Arathupaal – Seinandri aarithal
(B) Porutpaal – Solvanmai
(C) Kamathupaal – Naanthturavuraithal
2. Vetrivetkai – (40 Adigal)
3. Penmathimaalai (32 Paadalgal)
(A) Thaiva bakthi (19 Kannigal)
(B) Guruvanakkam (5 Kannigal)
(C) Mathapita vanakkam (8 Kannigal)
4. Bharathithasan Aathisudi (84 Adigal)

myF : 3 : ,yf;fpatuyhW: ghle;jGtpa ,yf;fpatuyhW

1. gjpbdz;fPH;f;fzf;F E]y;fs;
2. lk;bgU';fhg;gpa';fs;
3. l";rpWfhg;gpa';fs;
4. fk;guhkhazk;

Alagu – 3

1. Pathinenkizhkanakku Noolgal
2. Iamberungappiyangal
3. Iachirukappiyangal
4. Kambaramayanam

myF : 4 :

g[jpdk; - tothry; - rp.R.bry;yg;gh.

Alagu – 4

Puthinam – Vaadivasal – C. S. Sellappa.

myF : 5 :

brk;bkhHp tuyhW - r';fk; Xtpa ciur; r';f btspaPL.

Alagu – 5

Semmozhi Varalaru – Sangam Voviya vurai Sanga velieedu.

ghpe;Jiu Ely;

jkpH; ,yf;fpaturyW - Kidth; rh.rthpKj;J

Recommended Book

Tamizh Elakkiya Varalaru – Munaivar C Savari muthu

gad;fs; : Course Outcome

CO1	:	bgU';fhg;gpa ,yf;fzg;go rpyk;g[/ nkfiy/ rpe;jhkzp/ fk;guhkhazk; Fwpj;j jfty;fisj; bjhp;Jf; bfhs;sy;. Perungappiya Elakkanappadi Selambu, Megalai, Sinthamani, Kambaramayanam kuritha tagavalkalai terintu kollal.
CO2	:	r';fk; kUtpa fhyj;jpy; vGjg;gl;l ePjp Ely;fspd; tHp ePjpf; fUj;Jf;fis mwpjy;. Sangam maruviya kalathil ezhuthappatta Neethi Noolgalin Vazhi Neethi karuthukkalai Arithal.
CO3	:	,yf;fpaj;ij mjd; tuyhw;W mog;gilapYk;/ Ely; Fwpj;j bra;jpfisa[k; fw;Wf; bfhs;sy;. Elakkiyathai Athan Varalathru Adipadaiyilum, Nool Kuritha Seithikalaiuum Katru kollal.
CO4	:	jkpHhp; tPu tpisah;l;llhd #y;yppf;fl;od; rpwg;iga[k; bgUikiaa[k; mwpjy;. Tamizhrin Veera Velaiyattukalana Jallikattin Sirappaiuum Perumaiyaiuum Arithal.
CO5	:	jkpHUf;F brk;bkhHp jFjp fpil;jija[k;/ brk;bkhHp;fhf ghLgl;lth;fisg; gw;wpa jfty;fisa[k; bjhp;Jf; bfhs;sy;.

		Tamizharukku Semmozhi Takuti Kidaithathaiuum, Semmozhihaha Padupattavargalai Patriya Tagavalgalaiuum Terintu Kollal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	3
CO2	2	3	2	3	3
CO3	2	3	2	3	2
CO4	3	3	3	2	3
CO5	3	2	3	3	2
AVERAGE	2.6	2.4	2.6	2.6	2.6

**ehd;fhk; gUtk;: jhs; : IV : bghJj;jkpH;
Fourth Semester : Paper : IV : General Tamil**

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

- 120.jkpHh;fspd; giHa gz;ghl;il r';f ,yf;fpa tHp mwpKfg;gLj;Jjy;.
- 121.ehlf ,yf;fpaj;jpd; njhw;iwa[k; mt;tpyf;fpak; jkpH;r; r_fj;ij gw;wpa
gpujpgypg;iga[k; mwpar; bra;jy;.
- 122.gilg;g[,yf;fpa';fis mwpKfg;gLj;jp ,yf;fpak; gilf;Fk; jpwid
cUthf;Fjy;.

Course Objectives :

- 120.Tamizharkalin Pazhaya Panpadhai Sanga Ilkkiyam Vazhi
Arimugapaduthuthal.
- 121.Naadaga Ilakkiyathin Thotrium Avilakkiyum Tamil Samugaththai
Patriya Pithipalipaiyam Ariya Seythal.
- 122.Padaipu Ilakkiyakakai Arimugapaduthal Ilakkiyam Padaikum
Thiranai Uruvakuthal.

myF : 1

- **FWe;bjhif (5 ghly;fs;)-**
 1. ,of;Fk; nfsph;!Ek;Fiw Mf.....(ghly; 58)
 2. rpiwgdpcile;jnrahpkHf;fz;...(ghly; 86)
 3. mUtpg; gug;gpd; ltdk; tpj;jpg;... (ghly; 100)
 4. tpGj;jiyg; bgz;iztpisay; khkly;...(ghly; 182)
 - 5.fhe;jsk; bfhGKif/ fhty; bry;yhJ...(ghly; 265).
- **ew;wpiz (3 ghly;fs;)**
 1. jlkUg;g[vUikkleilf; FHtp (ghly; 120)
 2. g[y;nyd; kfpH;e! g[yj;jhYk; ,y;nyd;.....(ghly; 340)
 3. thiHbkd;njhLthh;g[Wg[Cf;Fk; ... (ghly; 400).
- **mfehD]W(3 ghly;fs;)**
 1. te;JtpidKoj;jdd; nte;jDk;/ giftUk;...(ghly; 44)
 2. kiypirf; Fiy,acUbfGjpUtpy;...(ghly; 84)
 3. ngh;ciwjiy,abgUk;g[yh; itfiw...(ghly; 194).
- **fypj;bjhif (3 ghly;fs;)**
 1. ghmy;m";brtpg; gizj;jhs; khepiu...(ghly; 5)
 2. mhpJMamwd;va;jpmUspnahn;f;Fmispj;jYk;... (ghly; 11)

3. gy;tsk; gfh;g[Cl;Lk; gad;epyk; itJmwr;... (ghly; 20).
- **I';FWE]W (5 ghly;fs;)**
1. md;idthHpntz;Lmd;id! g[d;id (jha;f;Fiuj;jgj;J) (ghly; 110)
 2. mk;kthHp/ njhHp!bed;dy;... (njhHpf;Fiuj;jgj;J) (ghly; 113)
 3. vf;fh; "hHy; kyhpy; kfsph;...("hHw; gj;J) (ghly; 147)
 4. bts;sh'; FUfpd; gps;isbrj;bjd...(bts;sh';FUF gj;J) (ghly; 159)
 5. bgU';flw;fiuaJrpWbtz;fhf;if (rpWbtz;fhf;ifg; gj;J) (ghly; 165).

Alagu – 1

Kuruthogai (5 paadal)

- 1.Idikum kaalir ! Nuumkurai Aaka....(paadal 58)
- 2.Siraipanudaiththasayarimazhaikaan... (paadal 86)
- 3.Aruvin parappin Ivanam viththip...(paadal 100)
- 4.Vizhuthalaip pennaivilaiyal maamadal...(paadal 182)
- 5.Kadhalam kuzhumugai , Kaaval sollaathu...(paadalgal 265)

Natrinai (3 paadalgal)

- 1.Tadamaruppu yerumaimadai kuzhuvi...(paadal 120)
- 2.Pullen makizdha ! Pulaththalum illen....(paadal 340)
3. Vaazhaimenthoduvaarpurupu vukum...(paadal 400)

Akanaanoor (3 paadalgal)

- 1.Vanthuvinai mudithanan veththanum , pagaivarum...(paadal 44)
2. Malaimisai kulai iyaurukazh uthiruvil..(paadal 84)
3. Per uraithalai iyaperumpular vaikarai.. (paadal 194)

Kalithokai (3 paadalgal)

- 1.Pa.al. Ajasavi panaithal maanirai...(paadal 5)
- 2.Arithu aaya aran yaithi aruliyoorku alithalum...(paadal 11)
- 3.Palvalam pakarpu vuildum payannilam vaithuara...(paadal 20)

myF 2:

➤ **g[wehD]W (3 ghly;fs;)**

1. X';Fkiyg; bgUtpy; ghk;g["hz; bfhsP,... (ghly; 55)
2. mspnjhjhnd/ ghHPaJgwk;ng!... (ghly; 109)
3. xy;YtJxy;Yk; vd;wYk;/ ahth;f;Fk;...(ghly; 196).

➤ **gjpw;Wg;gj;J (2 ghly;fs;)**

1. bjhWj;jtay; Muk; gpwH;et[k;... (ghly; 13)
2. epyk;g[ilg;g[md;dMh;g; bghLtpRk;g[Jila{... (ghly; 44).
3. gl;odg;ghiy (1 Kjy; 220 motiu)

Alagu – 2

Puranaanoor (3 paadalgal)

- 1.Okumalai peruvil paampunaan kaolii...(paadal 55)
- 2.Alithothane , Pariyathuparampe !...(paadal 109)
- 3.Olluvathuollum yenralum , yavarkum...(paadal 196)

Pathirupathu (2 paadalgal)

- 1.Thoruthavayal yaarum pirazhnavam...(paadal 13)
- 2.Nilampadaipu anna aar pooduviisumpa thudaiyu...(paadal 44)
- 3.Pattinapaalai (1 muthal 220 adivarai)

myF : 3 : ,yf;fpauyhW: ghle;jGtpa ,yf;fpauyhW

1. bjhy;fhg;gpak;
2. vl;Lj;bjhif
3. gj;Jg;ghl;L

Alagu –3

Ilakkiyavarallaru : Paadathazhuviya ilakkiyavarallaru

- 1.Tholkaappiyam
- 2.Yetthokai
- 3.Pathupaadu

myF 4 :

ehlfk; - Mrphpah; nrnahd; - mk;khvg;gePghl;oaht?

Alagu – 4

Naadakam – Aashiriyar seyoona – Ammayeppaniipaadiyarva ?

myF5 :gilg;ghf;fj;ipwd;

1. ftpijahf;fk;
2. rpWfijgilj;jy;
3. Xu';f ehlfk; ,aw;wy;
4. gazf;fl;Liu

Alagu –5

Padaipaakathiran

- 1.Kavithaiyaakam
- 2.Chirukathaipadaithal
- 3.Oraka naadakam iyatral
- 4.Payanakatdurai

ghpe;Jiu Ely;

jkpH; ,yf;fpa tuyhW - Kidth;.g.r. VRjhrd;/ epa{ br";;Rhp g[f; At[!; (gp) ypl;.

Recommended Book

Tamzh ilakkiya varalaaru – Munaivar . P . S . Yesuthasan , Niyu century book house (B) Ltd.

gad;fs; : Course Outcome

CO1	:	r';f fhyj;jpa epy mikg;gpida[k;/ mjd; mog;gilapy; kf;fspd; thH;f;if Kiwfisa[k; mwpe;Jf; bfhs;sy;. Sanga kalaththil nila amaippinaiyum, adhan adippadaiyiil makkalin vazhkai muraigalaiyum arinthu kollal.
CO2	:	r';f fhy nggh; Kiwfisa[k; nghUf;Fhpa mwf; nfhl;ghLfisa[k; bjhpe;Jf; bfhs;sy;.

		Sanga kala por muraigalaiyum porukkuriya arak kotpadugalaiyum therinthukollal.
CO3	:	r';f ,yf;fpa';fshd vl;Lj;bjhif/ gj;Jg;ghl;Lg; gw;wpa bghJg;ghh;it. Sanga ilakkiyangalana ettuthogai, paththupattu patriya pothu parvai.
CO4	:	,d;iwa fhyj;jpy; gzf;Fr; bry;Yk; bgz;fspd; kdepিয়া tpsf;Fjy;. Indraiya kalaththil panikku sellum pengalin mananilaiyayi vilakkuthal.
CO5	:	gilg;ghf;jj;pwid tsh;j;jy;. Padaippakkathiranai valarthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	2
CO2	3	3	2	3	2
CO3	2	3	3	2	3
CO4	1	2	2	3	3
CO5	2	3	3	2	3
AVERAGE	2.2	2.6	2.4	2.6	2.4

• **QUAID-E-MILLATH GOVERNMENT COLLEGE FOR
WOMEN(AUTONOMOUS)
ANNA SALAI, CHENNAI-02**
DEPARTMENT OF TAMIL
**SEMESTER SYSTEM WITH CHOICE, BASED CREDIT SYSTEM,
STUDENTS ADMITTED**
 • **FROM 2017 - 2018**

Semester	Components	Title of the paper	Lec/Hrs./Wk.	C.A	S.E.	Total	Credit

I	Core jhs:: 1	, yf;fpak; - I ,f;fhy ,yf;fpak;	5	25	75	100	4
		,yf;fzk;- I ed;D]y; vGj;J	5	25	75	100	4
	Allied – I	jkpHf tuyhW kf;fSk; gz;ghLk; – I	6	25	75	100	5
	NME – I		2	40	60	100	2
	Soft Skill-I		2	40	60	100	3
II	Core jhs:: 3	,yf;fpak; - II rka ,yf;fpak;	5	25	75	100	4
	Core jhs:: 4	,yf;fzk;- I ed;D]y; brhy;	5	25	75	100	4
	Allied – II	jkpHf tuyhW kf;fSk; gz;ghLk; – II	6	25	75	100	5
	NME – II		2	40	60	100	2
	Soft Skill-II		2	40	60	100	3
III	Core jhs:: 5	,yf;fpak; - IIlrpw;wpyf;fpak;	4	25	75	100	4
	Core jhs:: 6	,yf;fzk;- III ek;gpafg;bghUs; g[wg;bghUs; btz;ghkhiy	5	25	75	100	4
	Allied – III	jkpH; ,yf;fpa tuyhW – I	5	25	75	100	5
	Soft Skill-III		2	40	60	100	3
	EVS		-	-	-	-	-
IV	Core jhs:: 7	,yf;fpak; - IV ePjp ,yf;fpak;	5	25	75	100	4
	Core jhs:: 8	,yf;fzk;- IV ahg;bgU';fyf;fh hpifa[k;/ jz;oay';fhuKk;	5	25	75	100	5
	Allied – IV	jkpHf ,yf;fpa tuyhW – II	5	25	75	100	5
	NME – IV		2	40	60	100	3

	EVS External Exam		1	40	60	100	2
V	Core jhs:: 9	,yf;fpak; - V fhg;gpa';fs;	6	25	75	100	4
	Core jhs:: 10	fy;btl;oay;	6	25	75	100	4
	Core jhs:: 11	,yf;fpak; - V jkpH;bkhHp tuyhW	6	25	75	100	4
	Core jhs:: 12	,yf;fpaj; jpwdha;t[	6	25	75	100	4
	Elective jhs:: 1	ehl;Lg;g[w , yf;fpak;	5	25	75	100	5
	VE	kjpg;gPl;Lf; fy;tp	1	-	-	-	-
VI	Core jhs:: 13	, yf;fpak; - VI r';f , yf;fpa';fs;	6	25	75	100	4
	Core jhs:: 14	,yf;fpak;- VI jkpH;r; brk;bkhHpg; gz;g[fs;	6	25	75	100	4
	Core jhs:: 15	,yf;fpak;- VI jpuhtpl bkhHpfspd; xg;gha;t[	6	25	75	100	4
	Elective jhs:: 2	,jHpay;	5	25	75	100	5
	Elective jhs:: 3	gilg;gpyf;fpaKk; bkhHpbgah;g;g[k;	5	25	75	100	5
	VE	kjpg;gPl;Lf; fy;tp	1	40	60	100	2

EVALUATION PATTERN FOR CA

Distribution of marks for Continuous Assessment:- Theory

Part I, Part II & Part III

Test		Total	Assignment/Seminar/ Creative Presentation/ Assignment on glossary			Model Exam	Attendance	Total	Reduced to
1	2	40	1	2	3	25	10	100	25
20	20		10	10	5				

Test (two) : 40 Marks

Assignment / Seminar/ Creative Presentation/
Assignment on glossary : 25 Marks

Model Examination : 25 Marks

Attendance : 10 Marks

Attendance percentage

90 & above : 10 Marks

80 & above : 9 Marks

75 & above : 8 Marks

65 & above : 7 Marks

55 & above : 6 Marks

End Semester Theory Examination: Question Paper Pattern:

Section A Short answers(answer ANY TEN questions) : 10 X 2 = 20 Marks

Section B Paragraph answers : 5 X 5 = 30 Marks (5 out of 8)

Section C Essay : 3 X 10 = 30 Marks (3 out of 5)

Total : 75 Marks

B.A. DEGREE COURSE

,s';fiy - Kjyhk; Mz;L - Kjw;gUtk;

Ilangalai – First Year – First Semester

jhs; : 1 (,yf;fpak; - I) : ,f;fhy ,yf;fpak;

Paper : 1 (Ilakkkiyam – I): Ikkala Illakkiyam

Total Hours : Course Code :

Credits : L.T.P. :

nehf;fk; :

123.fhy tuyhw;W mog;gilapy; ,yf;fpa';fis neh;Fk;ngghJ jw;fhy
,yf;fpa';fspd; tifa[k; cl;bghUSk; Fwpj;J mwpa itj;jy;.

124.,f;fhy ,yf;fpa tifkfSf;F vLj;Jf;fhl;lhf cs;s rpy gilg;g[fis tpsf;Fjy;.

125.khzth;fs; j';fSila gilg;g[j; jpwid tsh;j;Jf; bfhs;s ,f;fhy ,yf;fpa tifkfs;
cjt[jy;.

Course Objectives :

123.Kaala Varalaatru Adipadaiyil Ilakiyangalai Nokkumpothu Thrkaala
Ilaikiyangalin Vakaiyum Utporulum Kurithu Ariya Vaiythal.

124.Ikkala Ilaikkya Vaimaigalumkkum Eaduthukkattaga Ulla Sela
Badaippukalai Vilakuthal.

125.Manavargal Thangaludaya Badaippu Tharanai Valarthuk Kola
Ikkala Ilakkiya Vagaimaigal Uthavuthal.

myF -1 : ftpij - kug[f; ftpij

1. ghujpahh; - ghuj #d';fspd; jw;fhy epiyik -“be";R bghWf;Fjpy;iyna...”
2. ghujpjhrd; cyfg;gz;ghl;L -“gFj;jwpt[kd;wj;jpy;...”
3. ftpkzp - kUkf;fs; tHp khd;kpak; (FyKiwfpsj;Jglyk;)-“vd;fijnfSk;...”
4. ehkf;fy; ftp"h; - jkpHd; ,jak; -“jkhPd; vd;nwhh; ,dKz;L...”
5. gl;Lf;nfh;il fy;ahzRe;judhh;;-J]';fhnj jk;gp J]';fhnj-“J]';fhnj jk;gp...”
6. fz;zjhrd;- mu';nfWk; brhw;fs; -“fd;Wjhd; rp';fk;...”
7. thyp - g[d;dif kd;dd; - “nA! kAhj;kh...”
8. g[tpauR - kPwy; - “rg;g[f; bfhl;Lk;...”
9. tyir g.fnzrd; - g[fHpD; cr;rpapy; VW - “thapidg;...”
10. fhrp Mde;jd; - jkpH;f;fd;dp njhw;wk; - “vj;ji vj;jid...”

Alagu – 1

1. Bharathiyaar – Baaratha Janangalin Tharkala Nilamai –“Nenju Porukkuthilaiye...”
2. Barathithasan – Ulappanpattai -:Paguththarivu Mandrathil....:::
3. Kavimani-Mamumakkal Vazhi Maanmiyam (Kulamuraikilathu Padalam...”
4. Namakkal Kavinjar–Thamizhan Idhayam-:Thamizhan Eandur Inamunndu...”
5. Pattukkootai Kalayanasundharanar-Thoongathe Thambi Thoongathe-“Thoongathe Thambi”
6. Kannathasan-Arangerum Soorkkal –“Kandrudhan Singam...”
7. Vaali -Punnagai Mannan –“Hesa Magathma...”
8. Puviyarasu – Meeral-:Saappuk Kootum...’
9. Valasai P. Ganesan-Pugazhin Uicheyil Yearu-“Vaainaip”
- 10.Kaasi Aanandhan – Thamikkani Thotram -:Yeahanai...!

myF -2 : ftpij - g[Jf;ftpij/ iAf;T

3. e. gpr;r_h;j;jp - tp";"hdp -“flt[shy; vd;d...”
4. "hdf;Tj;jd; - ehs; -“bfhl;of;bfhz;L...”
5. ,d;Fyhg; - kz;TLfs; rhpe;jnghJ -“v';fpUe;njh ePSk;;...”
6. mg;Jy; uFkhd; - ghh;itapy; epHy; -“xUtiu xUth;...”
7. nkj;jh -Vh;nfh; ,utpth;kh -“epykfs; Kfkjp...”
8. rpw;gp - xU fpuhkj;J -“v';fpUe;J tUfpwJ...”
9. eh.Kj;Jf;Fkhh; - j';f kPd;fs; -“Mde;j ahHpId...”
10. jkpHr;rp j';fghz;oad; - v";nrhl;Lg;bgz;. -“v";nrhl;Lg;bgz;...”
11. K.bry;yh - bjhiye;Jnghd eiltz;o -“bjhiye;Jnghd...”

12. F.m.jkpH;bkhHp - rpwfpd; fPH; thdk; - iAf;T ftpijfs;

Alagu – 2

1. N. Pichchaimrthi – vinjanani:-kadavulal yenna...”
2. Gnanakoothan – Nall – “Kottikodu...”
3. Ingulap – mankudugal sarindhapothu – “ Yengiruntho Niloom...”
4. Abdul Raguman – paarvaiei Nizhal – “ Oruvarai Oruvar...”
5. Metha – Yerkol Ravivaruma – “ Nilamagal mugamathi...”
6. Serppi – Oru Gramatthu – “Yeguiruthu varugirathu...”
7. Naa. Muthukumar – thanga Mingal – “ Anandha Yazhinai”
8. Thamizhachi Thangapandiyan – Enjottuppen – “Enjottuppen..”
9. M. Chella – Thlainthupona Nadaivandi – “Tholainthupona...”
- 10.K.A. Thamizhmozhi – Siragin Keezh Vanam – Hichoo Kavithaigal.

myF -3 : rpWfij/ ciueil

rpWfij : brg;g[bkhHp gjpbdl;Lilahs; (,e;jpabkhHpr; rpWfijfs;)

3. Cul';F cj;jut[
4. fojk;
5. thH;f;if vd;gJ ftpijnah fw;gidnah my;y.
6. mk;kh tUths; vd;W...
7. RHy;

ciueil

1. flt[s; xUtnu - t.c.rp.

2. fz;nld; rPijia - ehkf;fy; ftp"h;
3. fhsj;jp ntIDk; f';if ntIDk; - uh.gp. nrJg;gps;is
4. Vl;of;Fg; nghl;o - fy;fp
5. gz;ghL - m.fp. gue;jhkdhh;

Alagu – 3

Sirukathai : Seppumozhi Pathinettudaiyal (India Mozhi Sirukathaigal)

1. Ooradangu uththaravu
2. Kaditham
3. Vazhkkai enbathu kavithaiyo karpanaiyo alla.
4. Amma varuval endru...
5. Chuzhal

Urainadai

1. Kadavul Oruvare – V.O.C.
2. Kanden Seethaiyai – Namakkal Kavingar
3. Kalaththi vedanum Gangai vedanum – R.P. Sethupillai
4. Yettikkuppotti – Kalki
5. Panpadu – A.K. Parandamanar

myF - 4: ehty::

_d;whk; cyfg;nggh; - ituKj;J.

Alagu – 4

Moondram Ulagappor – Vairamuthu.

myF - 5: ehlfk;

brf;F khLfs; - nfhky; Rthkpehjd;

Alagu – 5

Sekku madugal – Komal Swaminathan.

ghpe;Jiu E]y;fs;

1. Ch;tyk;/ nkj;jh. K/ tp#ah gjpg;gfk;/ nfhak;g[j;J]h;-1/ _d;.g.m./ 1980.
2. xU fpuhkj;J ejp/ rpw;gp/ ftpjh btspaPL/ ghz;ogrrh;/ jp.efh;. 17/ VHHk;.g. #&iy/ 2009.
3. fz;zjhrd; ftpijfs; (bjhFjp le;J) ftp"h;.fz;zjhrd;/ thdjp gjpg;gfk;/ jp.efh;.-17/ K.g. Mf.1972.
4. ftpkzp ghly;fs;/ ftpkzp njrpf tpdhfk; gps;is.
5. fhrp Mde;jd; ftpijfs;/ jkpH;f;fdy; (Kjy; bjhFg;g[]) czh;r;rp; ftp"h; gjpg;g[/ kJiu/ K.g.ij. 1982.
6. brf;F khLfs;/ nfhky; Rthkpehjd;.
7. brg;g[bkhHp gjpbd;Lilahs;/ jpUitfht{h;/ nfh.gpr;ir (jkhHf;fk;) (e;jpa bkhHpr; rpWfijfs;)/ epa{ br";Rhp At[!; (gp)ypl;./ brd;id-98/ K.g. #&d;/ 1998.
8. "hdf;Tj;jd; ftpijfs;/ mHfparp';fh; (bjhFg;g[]) tpUl;rk; gjpg;gfk;/ nkW;F khk;gyk;/ brd;id-33/ K.g. or./ 1998.
9. j';fkPd;fs;/ eh. Kj;Jf;Fkhh;.
10. jkpH;f; fl;Liu fs";rpak;/ ,uh.nkhfd;/ rhfpj;jpa mfhbjkp/ g[Jjpy;yp/ K.g.2009.
11. jkpH; iAf;T Mapuk;/ ,uh.nkhfd; (bjhFg;g[])/rhfpj;jpa mfhbjkp/ g[Jjpy;yp/ K.g.2012.
12. bjhiye;Jnghd eiltz;o/ K.bry;yh/ epa{ br";Rhp At[!; (gp)ypl;./ brd;id-98/ K.g. mf;.2009.
13. ehkf;fy; ftp"h; ghly;fs;/ ehkf;fy;/ bg.uhkyp';fk; gps;is.
14. gl;Lf;nfhil;il fy;ahz Re;juk; ghly;fs;/ gp,.. ghyfpU\;zd; (bjhFj;jth;) epa{ br";Rhp At[!; (gp)ypl;./ brd;id-98/ K.g. nk.1965.
15. ghujpjhrd; ftpijfs;/ ghujpjhrd;/ kzpthrfh; gjpg;gfk;/ ghhpKid-1/ K.g.1999.
16. ghujpahh; ftpijfs;/ ghujpahh;/ kzpthrfh; gjpg;gfk;/ ghhpKid-1/ K.g.1993.
17. ghy;tPjp/ mg;Jy; uFkh;d;/ mfuk; gjpg;gfk;/ rptf';if-1/ _gjp. mf;.1980.
18. g[fHpd; cr;rpapy; VW/ tyir/ g.fnzrd;/ epa{ br";Rhp At[!; (gp)ypl;./ brd;id-98/ K.g. #&iy/ 1992.

19. g[y]pefr; RtLfs;/ ,d;Fyhg;
20. bgha;f;fhy; Fjpiufs;/ thyp.
21. kPwy;/ g[tpauR.
22. _d;whk; cyfg;nggh;/ ituKj;J.

Recommended Book

1. Oorvalam, Mehtha, K., Vijaya Pathippagam, Coimbatore-1, M.P.A. 1980.
2. Orru Gramaththu Nathi, Sirpi, Kavitha Publications, Pandibazzarr, T.Naga-17, Ezham Pathippu, July 2009.
3. Kannadasan Kavithaigal (Part Five) Kavingar Kannadasan, Vaani Pathippagam, T.Nagar-17, M.P. Aug. 1972.
4. Kavimani Padalgal, Kavimani Desiga Vinayagam Pillai.
5. Kasi Anandan Kavithaigal, Thamizhkanal (First Edition) Unarchi Kavingar Pathippu, Mathurai, K.P. Thai.1982.
6. Chekku madugal, Komal Swaminathan.
7. Seppumozhi Pathinettudaiyal, Thiruvaigavoor, K. Pichai (Thamizhakkam), (India Mozhi Sirukathaigal), New Century House (P) Ltd., Chennai-98, M.P. June 1998.
8. Gnanakoothan, Kavithaigal, Azhagia Singar (Editor), Virutcham Pathippagam, West Mambalam, Chennai-33, M.P. Dec. 1998.
9. Thanga Meengal, Naa. Muthukumar.
10. Thamizh Katturai Kalanjiyam, R. Mohan, Sagithiya Academy, New Delhi, M.P. 2009.
11. Thamizh Hichoo Ayiram, R. Mohan (Editor), Sagithiya Academy, New Delhi, M.P. 2012.
12. Tholaindupona Nadaivandi, M. Chella, New Century House (P) Ltd., Chennai-98, M.P. Oct.2009.
13. Namakkal Kavingar Padalgal, Namakkal, P. Ramalingam Pillai.
14. Pattukkottai Kalyana Sundaram Padalgal, P.E. Balakrishnan (Editor), New Century House (P) Ltd., Chennai-98, M.P. May 1995.
15. Bharathidasan Kavithaigal, Bharathiyar, Manivasagar Pathippagam, Parimunai-1, M.P. 1999.
16. Bharathiyar Kavithaigal, Bharathiyar, Manivasagar Pathippagam, Parimunai-1, M.P. 1993.
17. Paal veethi, Abdull Rahuman, Agaram Pathippagam, Sivagangai-1, Moo.Pathi.Oct.1980.
18. Pugazhin uchiyil Yeru, Valasai, P. Ganesan, New Century House (P) Lt., Chennai-98, M.P. July 1992.
19. Pulinaga Suvadugal, Ingulap.
20. Poikkal Kuthiraigal, Vaali.
21. Meeral, Puviyarasu.

22.Moondram Ulagappor, Vairamuthu.

<https://www.youtube.com/watch?v=08mjXJSCpE8>

https://www.youtube.com/watch?v=pPBe6PyO_jk

gad;fs; : Course Outcome

CO1	:	ghujpahh;/ ghujpjhrd; nghd;w ,Ugjhk; E]w;whz;L ftp"h;fspd; rpy E]y;fs; tHp kug[f; ftpijg; gw;wp mwpe;J bfhs;Sjy;. Bhathiyar, Bharathidasan ponndra Irubatham Nootrandu Kavignargalinn sila Noolgal vazhi marabukavithai pattri arinthu kolluthal.
CO2	:	e.gpr;r_h;j;jp bjhl';fpa g[Jf;ftpjapd; rpwg;g[fis ,d;iwa gilg;ghspfspd; E]y;fs; _yk; g[hpe;Jf; bfhs;Sjy;. N. Pichhamurthi thodangiya Puthukkavithaiyin sirappukkalai indraiya padaippaligalin noolgal moolam purinthu kolluthal.
CO3	:	,f;fhy ,yf;fpa tot';fshd rpWfij/ ciueil gilf;Fk; jpwid rpwe;j gilg;ghspfspd; E]y;fs; tHp bgWjy;. Ikkala ilakkiya vadivangalana sirukathai, urainadai padaikkum thiranai sirantha padaippaligalin noolgal vazhi peruthal.
CO4	:	ehty; ,yf;fpa totk; jUk; gad;fSk;/ fiy czh;t[k; Fwpj;jr; bra;jpfis ituKj;J gilj;j _d;whk; cyfg;nggh; ehtypd; tHp mwpjy;. Novel ilakkiya vadivam tharum payangalum, kalai unarvum kuriththa seithigalai Vairamuthu padaiththa moondram ulagappor navalin vazhi aridhal.
CO5	:	ehlfk; vd;gJ E]y; tHpahf vj;jifa gaidj; jUfpd;wJ vd;gij nfhky; Rthkpehjdpd; brf;F khLfs; vDk; ehlf; gilg;g[_yk; tps';fpf; bfhs;Sjy;. Nadagam enbathu nool vazhiyaga eththagaiya payanai tharuginrathu enbathai Komal Swaminathanin Sekku Madugal enum nadaga padaippu moolam vilangi kolluthal.
CO5	:	ehlfk; vd;gJ E]y; tHpahf vj;jifa gaidj; jUfpd;wJ vd;gij nfhky; Rthkpehjdpd; brf;F khLfs; vDk; ehlf; gilg;g[_yk; tps';fpf; bfhs;Sjy;. Nadagam enbathu nool vazhiyaga eththagaiya payanai tharuginrathu enbathai Komal Swaminathanin Sekku Madugal enum nadaga padaippu moolam vilangi kolluthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	3
CO2	2	3	2	3	2
CO3	3	3	2	2	3
CO4	3	2	3	3	2
CO5	2	3	2	3	3
AVERAGE	2.6	2.6	2.4	2.8	2.6

jhs; : 2 – ,yf;fzk; - I: ed;D]y; - vGj;jjpfhuk;
Paper: 2 – Ilakkanam – I: Nanool -- Ezhuththathigaram

Total Hours	:	Course Code	
	:171602		
Credits	:	L.T.P.	:

nehf;fk; :

126.jkpHpd; le;jpyf;fz';fSs; Kjyhtjhd vGj;jpyf;fzj;ij khzhf;fUf;F
fw;gpj;jy;.

127.jkpH; vGj;Jf;fspd; jd;ikiaa[k;/ bkhHpapd; fl;likg;gpida[k;
czh;j;Jjy;.

128.vGj;Jg; gpiHapd;wp vGj ,yf;fz tpjpfisf; fw;wy;.

Course Objectives :

126.Thamizhin Inthilakkanangalum Muthalaavadhaana
Yezhuthilakkanathai Maanaakkakrukku Karopithal.

127.Thamizh Yeauthukallin Thanmaiyaiyum, Mozhiyin
Kattamaipinayum Unathuthal.

128.Yeazhthu Pizhaiindri Yezhutha Ilakkana Vithikalaik Karral.

myF -1 :

bgahpay;

Alagu – 1

peyariyal

myF - 2:

vGj;jpay;

Alagu – 2

Yeazhuthiyal

myF - 3:

gjtpay;

Alagu – 3

Pthaviyal

myF - 4:

caphPw;Wg; g[zhpay;

Alagu – 4

Uiyretrup punariyal

myF - 5:

bka;aPw;Wg; g[zhpay;/ cUg[g; g[zhpala

Alagu – 5

Meieetrrup punariyal, urup punariyal.

ghpe;Jiu E]y;

ed;D]y; - vGj;jjpfhuk; - fhz;oif ciu (fHf btspaPL).

Recommended Book

Nannool – yezhuthaigaram – kaandigai urai (kazhaga veliyedu).

gad;fs; : Course Outcome

CO1	:	E]ypdJ tuyhW/ vGtif kjk;/ gj;Jf;Fw;wk;/ mHF/ cj;jpKiw/ Mrphpah; khzhf;fh; tuyhW/ ghl';fw;gpj;jy;/ nfl;ly; tuyhW Mfpatw;iw mwpar; bra;tJ. Noolinadhu varalaaru, yeazhuthuvagai madham, pathkkutram, azhagu, uththimurai,aasiriyar maanaaakkar varalaru, paadakarpilthal kettal varalaru aagiyavatrai ariyach seivathu.
CO2	:	bkhHpf;F Kjy; fhuzkhFk; xypna vGj;J vd;gij czh;e;J mt;btGj;Jf;fspypUe;J vz;/ bgah;/ Kiw/ gpwg;g[/ cUtk;/ khj;jpiu Mfpatw;iwf; fw;wwpjy;. Mozhikku mudhal karanamaagum oliye yeazhuthu yenpathai unarnthu avvapo zhuthukkaliruthu yen, peyar, murai,pirappu,uruvam, maathirai aagiyavatraik kattrarithal.
CO3	:	brhw;fspd; g[zh;r;rpia mwpe;J gpiHapd;wp vGjt[k;/ fw;ft[k; bjhp;J bfhs;Sjy;. Sorgallin punaarchiyai arinthu Pizhaintri ezhuthavum, katkavum terintu kolluthal.
CO4	:	bghJg;g[zh;r;rp/ caphPw;W rpwg;g[g; g[zh;r;rp gw;wpa[k;/ caphPw;W Kd; ty;ypdk; kpFk; ,l';fisa[k; mwpe;J bfhs;th;. Potupunarchi, Vueretru sirappu Punarchi patriyum, Vueretru mun Vallinam mikum edangalaiyum arintu kolvar.
CO5	:	bka;aPw;Wg; g[zh;r;rp/ cUg[g[zh;r;rp/ zfu/ dfu cUg[fs;/ kfu <W/ tfu <W rhhpiafs; gw;wpa ,yf;fz g[zh;r;rpia fw;Wzh;th;. Meiyeetru punarchi, Vurubu punarchi, nagara, nagara vurubugal, Magara Yeeru, Vagara Yeeru Saariyargal patriya Elakkana punarchiyai katrunarvar.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2
CO2	3	3	3	3	2
CO3	3	3	3	3	2

CO4	3	3	3	3	2
CO5	3	3	3	3	2
AVERAGE	3	3	3	3	2

jhs; : 3 – ,yf;fpak; - II : rka ,yf;fpak;

Paper : 3 – Ilakkiyam – II : Samaya Ilakkiyam

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

- 129.fhye;njhWk; gf;jp ,yf;fpa tsh;r;rpia vLj;Jiuj;jy;.
- 130.rka ey;ypzf;fj;ij cUthf;Fjy;.
- 131.rpw;wpyf;fpa';fs; tHp gf;jp bewpawpjy;.

Course Objectives :

- 129.Kaalandhorum bakthi ilakkiya valarachiyai eduthuraithal .
- 130.Saamaya nalinakkathai uruvaakudhal.
- 131.Sitrilakkiyangal vali bakthi neriyeridhal.
- 132.

myF -1 :

gjpndhuhk; jpUKiw - nrukhd; bgUkhs; ehadhhpd; bghd;tz;zj;Jj;
jpUte;jhjp (1-65 ghly;fs;)

Alagu – 1

Pathinoram thirumurai – seramaan perumaal naayanaarin ponvannath
thiruvandhathi (1-65 Paadalgal)

myF - 2:

- 1. jpUkhiy - bjhz;luog; bgahoahH;thh; (1-45 ghly;fs;)
- 2. jpUf;FWe;jhz;lfk; - jpUk';ifahH;thh; (1-20 ghly;fs;)

Alagu – 2

- 1. Thirumalai – thondaradi podiyazhvar (1-45 Padalgal).
- 2. Thirukurandhandagam – Thirumangaiyazhvar (1-20 Padalgal).

myF - 3:

jpUtUl;gh Mwhk; jpUKiw - jpUtUl;gpufhr ts;syhh;.

- 1. gukrpt tzf;fk;
- 2. jpUr;rpw;wk;gyj; bja;tkzpkhiy
- 3. Mw;whik
- 4. gpw;gtk; nghwhJ ngJwy;
- 5. khiy - tpyf;fH';fy;
- 6. KiwaPL (1-53 ghly;fs;)

Alagu – 3

Thiruvatpa aaraam thirumurai – thiruvartprakasa Vallalar.

- 1. Paramasiva vanakkam.
- 2. Thiruchittrambalath deivamanimalai.
- 3. Atraamai.

- 4. Pirpavam poaraadhu Pedhural.

5. Maalai – vilakkalandal.
6. Muraiyeedu (1-53 Paadalgal).

myF - 4:

1. fpwp!;Jtpd; mUs;ntl;ly; - jpU.tp.f. (KGika[k;)
2. ,ul;rz;a kndhfuk; - ghy;a gpuhh;j;jid (1-40 ghly;fs;)

Alagu – 4

1. Kristhuvín arulvettal – Thiru.Vi.K. (Muzhumaiyum)
2. Iratchanya Manogaram – Palya Prarthanaí (1-40 Padalgal)

myF - 5:

mfi;jPrd; rjfk; - Fz';Fo k!;jhd; rhfpg[- FUtzf;fk; Kjy; tspeiy Koa (1-50 ghly;fs;)

Alagu – 5

Agathisan sadhagam – gunagudi masthan saagippu – guruvannakkam mudhal valinalai mudiya (1-50 Paadalgal).

ghpe;Jiu E]y;

1. ,ul;rzpa kndhfuk;/ lhf;lh;. fjph; KUF rhujh gjpg;gfk;/ 2010.
2. ,naR fhtpak;/ ftpauR fz;zjhrd;/ fiyf;fhtphp/ jpUr;rp/ 2014.
3. fpwp!;Jtpd; mUs; ntl;ly;/ Kidth;.fkyh KUfd;/ rhujh gjpg;gfk;/ 2008.
4. Fz';Fo k!;jhd; rhfpg;g[ghly;fs;/ kh.tontY Kjypahh;/ Ky;iy epiyak;/ brd;id/ 2015.
5. ehyhapu jpt;a gpuge;jk;/ jpUnt';flj;jhd; jpUkd;wk; btspaPL/ brd;id/ 1973.
6. gjpbduhe; jpUKiw/ g[lyth;. gp.uh.eluhrd;/ ckh gjpg;gfk;/ brd;id/ 2005.
7. jpUtUl;gh/ _yKk; ciua[k; (vl;lhk; bjhFjp)/ xsit j.Jiurhkpg; gps;is/ mz;zhkiyg; gy;fiyf;fHf btspaPL/ 1988.

Recommended Book

1. Ratchaniya manogaram ,DR. Kathir murugu saaradha padhipagam , 2010.
2. Yesu kaaviyam , Kaviarasu Kannadhasan , kalaikaaveri , Thiruchi , 2014.
3. Kirusthuvín arul vettal , munaivar.Kamala murugan , saaradha pathippagam, 2008.
4. Gunangudi masthan saagippu Paadalgal , M . Vadivelu mudhaliyar , mullai nilaiyam , Chennai , 2015.
5. Naalayira dhivya pirabandham , thiruvengadathan thirumandram veliyeedu , Chennai , 1973.
6. Padhinoram thirumurai , pulavar . P.R.Nadarajan , Uma padhippagam , Chennai , 2005.

7. Thiruvartuppa , moolamum uriyum (ettam thogudhi) , ovvai T .
Duraissaamippillai , Annamalai palgalaikazhagam veliyeedu , 1988.

E – LEARNING RESOURCES

<http://www.tamilvu.org/ta/library-l4100-html-l4100cor-135660>

<https://www.dinamani.com/weekly-supplements/tamilmani/2016/aug/22/%E0%AE%9A%E0%AE%AE%E0%AE%AF-%E0%AE%87%E0%AE%B2%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AE%BF%E0%AE%AF%E0%AE%AE%E0%AF%8D-%E0%AE%95%E0%AF%82%E0%AE%B1%E0%AF%81%E0%AE%AE%E0%AF%8D-%E0%AE%86%E0%AE%A3%E0%AF%8D-%E0%AE%AA%E0%AF%86%E0%AE%A3%E0%AF%8D-%E0%AE%9A%E0%AE%AE%E0%AE%A4%E0%AF%8D%E0%AE%A4%E0%AF%81%E0%AE%B5%E0%AE%AE%E0%AF%8D-2557636.html>

gaf;fs; : Course Outcome

CO1	:	fhy khw;w';fnshL Toa gf;jp bewpiaf; fw;Wf; bfhs;Sjy;. Kala matrangalodu koodiya bakthi netriyai katra kolluthal.
CO2	:	rkag; bghiwa[k; xw;Wika[k; Toa ,iwaDgtj;ijg; bgWjy;. Samaya poraiyum otrimaiyum koodiya iraiyanubavathai peruthal.
CO3	:	gf;jp ,yf;fpa';fs; kpFjpahd rpw;wpyf;fpa';fs; tHp jkpH; tsh;j;jikia mwpjy;. Bakthi ilakkiyangalana miguthiyana sitrilakkiyangal vazhi thamizh varthamaiyai arithal.
CO4	:	,ilf;fhyj;J gf;jp ,yf;fpa';fs; ,iraa[[k;/ jkpiHa[[k; tsh;j;jikiaj; bjhpe;J bfhs;Sjy;. Idaikalathu bakthi ilakkiyangal isaiyum, thamizhaiyum valarthamaiyai therinthu kolluthal.
CO5	:	----- -----

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2

CO2	2	3	1	2	2
CO3	3	2	3	2	2
CO4	2	2	2	3	1

CO5	2	2	2	2	3
AVERAGE	2.4	2.2	2	2.2	2

**jhs; : 4 – ,yf;fzk; - II: ed;D]y; - brhy;yjpfhuk;
Paper: 4- Ilakkanam – II: Nanool - Sollathigaram**

Total Hours	:	Course Code
	:171604	
Credits	:	L.T.P.
		:

nehf;fk; :

- 132.ehy;tifr; brhw;fspd; ,yf;fzj;ij mwpt[Wj;Jjy;.
- 133.brhw;fspd; mikg;iga[k;/ tiffisa[k; gapw;Wtpj;jy;.
- 134.brhw;fisg; gpiHapd;wp vGJk; tHpfisf; fw;gpj;jy;.

Course Objectives :

- 133.Naalvagai sorkalin ilakkanaththai arivuruththal.
- 134.Sorkalin amaippaiyum, vagaigalaiyum payittruviththal.
- 135.Sorkalai pizhaiyinri ezhuthum vazhigalai karpiththal

myF -1 :

bgahpay;

Alagu – 1

Peyariyal

myF - 2:

tpidapay;

Alagu – 2

Vinaiyiyal

myF - 3:

bghJtpay;

Alagu – 3

Pothuviyal

myF - 4:

,ilapay;

Alagu –4

Edaiyiyal

myF - 5:

caphpay;

Alagu – 5

Uyiriyal

ghpe;Jiu Ely:

ed;D]y; - brhy;yjpfhuk; - fhz;oif ciu (fHf btspaPL).

Recommended Book

Nanool – Sollathigaran – Kaandigai Orai (Kazhaga Veliyeedu).

E – LEARNING RESOURCES<http://www.tamilvu.org/library/I0900/html/I0900ind.htm><https://www.bookshare.org/browse/book/1069534?returnPath=L2Jyb3dzZS9hdXRob3I%2FbW9kdWxlTmFtZT1wdWJsaWMma2V5PUFydW11Z2EgTmF2YWxhciBBdmFyZ2Fs>**gad;fs; : Course Outcome**

CO1	:	brhy;ypd; bghJ ,yf;fzk;/ ,Ujpiz/ lk;ghy;/ _tplk; gw;wpa[k;/ bra;a[[s; ,d;dbjd;gJ vd;gija[k; fw;wwpjy;. Sollin Pothu Ilakkanam , Iruthinai , Imball , Moovidam Patrium, Cheyyul Innathebathu Eabanthaiyum Katrarithal.
CO2	:	jkpH;r; brhw;;fspd; tiffisa[k;/ ntw;Wik tiffisa[k; khzhf;fh; fw;Wf; bfhs;th;. Tamizh sorkalin Vagaigal , Vetrumai Vagaigalaiyum manaakkar katra kolvar .
CO3	:	Kw;Wtpid/ bgabur;rk;/ tppidbar;rk; tpjpfis mwpe;J bfhs;th;. Mutruvinai , Peyaricham, vinaiyecham vithigalai arinthu kolvar.
CO4	:	,ilg;gpwtuy;/ ghy;bghJik/ bjhfepiy/ bjhfepiy Mfpatw;iwf; fw;Wzh;jy;. Idaipiravaal, Palpothumai, Thogainilai, Thoga Nilai Agiyavatrai Katrunarthal.
CO5	:	tHhepiy tGtikjp/ mWtftpdh/ vz;tif tpil/ bghUs;nfhs; ,yf;fz';fis khzhf;fh; bjhp;J bfhs;Sjy;. Vazha Nilai Vazhuvamaithi Nilai, Aruvagaivina, Envagai Vidai, Porulkol Ilakkanangalai Manaakkar Therinthu Kolluthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2
CO2	3	3	3	3	2
CO3	3	3	3	3	2
CO4	3	3	3	3	2
CO5	3	3	3	3	2
AVERAGE	3	3	3	3	2

_d;whk; gUtk; - ,yf;fpak; - III
Third Semester – Ilakkiyam – III
jhs; : 5: rpw;wpyf;fpak;
Paper: 5 : Sitrilakkiuyam

Total Hours	:	Course Code	
	:	171605	
Credits	:	L.T.P.	:
<u>nehf;fk; :</u>			

- 135.khzth;fSf;Fj; jkpH; ,yf;;fpaj;jpy; cs;s gphpt[fspy; xd;whd
rpw;wpyf;fpak; Fwpj;J mwpKfg; gLj;JjYk;/ tpsf;fpa[iuj;jYk;.
- 136.khh;fHp khjk; jpUg;gs;spbaGr;rpq; ghly;fs; nfhapy;fspy;
Xjg;gLfpd;wd. ,g;ghly;fs; rpw;wpyf;fpa tirna vd mwpa;itj;jy;.
- 137.gf;jp czh;tpidj; jUk; rpw;wpyf;fpa';fs; gy;ntW tot';fspy;
gilf;fg;gl;Ls;sij tpsf;FtJk;/ mjd; jdpr;Ritfis mwpa itj;jYk;.

Course Objectives :

- 136.Maanavargalukku Thamizh Ilakkiyathil Ulla Pirivugalil Ondraana
Sitrillakiyam Kurithu Arimugam Padythudhalum Vilakkiyuraithalum
.
- 137.Maargali Maadham Thirupalli Elluchi Paadalgal Koyilgalil
Oadhappadukindrana. Yippadalgal Sitrilakiya Vasaiye Ena
Ariyavaithal.
- 138.Bakthi Unarvinai Tharum Sitrilakkiyangal Palveru Vadivangalil
Padaikkappattulladhahi Villakkuvadhumi, Adhan Thanischuvaigalai
Ariyeva Vaithalum .

myF -1 :

1. kJiuf;fyk;gfk; - FkuFUguh; - 25 ghly;fs; (5/ 11/ 13/ 15/ 16/ 17/ 20/ 21/ 23/ 28/ 30/ 33/ 35/ 40/ 55/ 57/ 61/ 62/ 74/ 75/ 76/ 77/ 80/ 81/ 97).
2. jf;fahfg;guzp - xl;lf;Tj;jh; - 29 ghly;fs; (245/ 246/ 247/ 248/ 249/ 253/ 259/ 260/ 261/ 265/ 268/ 292/ 322/ 323/ 324/ 327/ 328/ 329/ 330/ 331/ 332/ 335/ 352/ 361/ 375/ 396/ 400/ 429/ 440).

Alagu – 1

1. Madhuraikalambam – Kumaragurubarar – 25 Paadalgal (5 ,11 ,13 ,15 , 16 , 17 , 20 , 21 , 23 , 28 , 30 , 33 , 35 , 40 , 55 ,57 , 61 , 62 , 74 , 75 , 76 , 77 , 80 ,81 , 97)
2. Thakkayaagapparanni – Oattakkoothar – 29 Paadalgal (245 , 246 , 247 , 248 , 249 , 253 , 259 , 260 , 261 , 265 , 268 , 292 , 322 , 323 , 324 , 327 , 328 , 329 , 330 , 331 , 332 , 335 , 352 , 361 , 375 , 396 , 400 , 429 , 440).

myF - 2:

1. mw;gljj; jpUte;jhjp - fhiuf;fhyk;ikahh; (1 - 25 ghly;fs;).
2. jpUr;rhHy; - khzpf;fthrfh; (1 - 20 ghly;fs;).

Alagu – 2

- 1.Arpuḍha thiruvandhadhi – Kaaraikaalamaiyar (1 – 25 Paadalgal)
- 2.Thiruchalal – Maanikkavaasagar (1 – 20 Paadalgal).

myF - 3:

1. rPu';fehjh; Cry; - gps;isg; bgUkhs; la';fhh; (1 - 20 ghly;fs;)
2. jz;liyahh; rjfk; - gof;fhRg; g[yth; (1 - 25 ghly;fs;)

Alagu – 3

1. Seeranganaadhar oosal - Pillai perumal iyangar (1 – 20 Paadalgal)
2. Thandalaiyar sadhagam – padikaasu pulavar (1 – 25 Paadalgal)

myF - 4:

1. mKjbbkhHp khiy - Vtp.vk;. e!pKj;jPd; (1 - 25 ghly;fs;)
2. bgj;ynfk; Fwt";rp - ntjehafk; rh!;jphpahh; (1-24 ghly;fs;)
m. rp';fp tut[rpe;J - 6 ghly;fs;
M. rp';fp eldr; rpe;J - 6 ghly;fs;
,. kiytsk; - 12 ghly;fs;

Alagu – 4

- 1 Amudha mozhi maalai – AV . M . Nasimuthin (1 – 25 Paadalgal)
- 2 Bethalagame kuravange – Vethanaayagam saasthirriyaar (1 – 24 Paadalgal)
A.Siggi varavvu sinthu – 6 Paadalgal
AA.Siggi nadana sinthu – 6 Paadalgal
I.Malaivalam – 12 Paadalgal

myF - 5:

- Kj;bjhs;shapuk; - ghz;oad; Fwpj;j 57 ghly;fs;.

Alagu – 5

Muthoolaayerram – Pandiyan kuritha 57 Paadalgal

ghpe;Jiu E]y;fs;

1. mKjbewp khiy/ Vtp.vk;.e!PKj;jPd;/ Rlh; gjpg;gfk;/ fhiuf;fhy;/ 2000.
2. mw;g]jj; jpUte;jhjp/ fhiuf;fhy; mk;ikahh;/ ciuahrphpah; g[yth;. jkpHKjd;/ Ky;iy epiyak;/ brd;id-17/ 2014.
3. m\lg; gpuge;jk;/ Kjy; bjhFjp/ rPu';fehjh; Cry;/ gps;isg; bgUkhs; la'fhh;/ ciu.tpj;thd; M. ehuhaz ntYg;gps;is/ Ky;iy epiyak;/ brd;id-2/ 1996.
4. jf;fahJguzp/ xl;lf;Tj;jh;/ ciu. c.nt.rhkpehijah;/ c.nt.rhkpehija;ah; E]y;epiyag; gjpg;g/ brd;id-20/ 1960.
5. jz;ilahhh; rjfk;/ gof;fhR g[yth;/ bghHpg;g[iu. g[yth; rpt.fd;dpag;gd;/ Ky;iy epiyak;/ brd;id-1/ 1995.
6. jpUthrfk;/ khzpf;fthrfh;/ ciu. Jiu.jz;lghzp/ ckh gjpg;gfk;/ brd;id-1/ 2007.
7. bgj;ynfk; Fwt";rp/ j";ir. nj.ntjehaf rh!;jphpahh;/ ciu.nr.Re;juuhrd;/ Ky;iy epiyak;/ brd;id-17/ 2009.
8. kJiuf; fyk;gfk;/ FkuFUguh;/ ciu.Kidth;. fjph;KUF/ rhujh gjpg;gfk;/ brd;id-14/ 2011.
9. Kj;bjs;shapuk;/ bjspt[iu. lhf;lh;.br.cyfehjd;/ Ky;iy epiyak;/ brd;id-17/ 2010.

Recommended Book

1. Amudhaneri Malai, A. M. Nasimudhi, Sudar Padhipagam, Kaaraikkal 2000.
2. Arputha Thiruvaththathi, Kaaraikal Ammaiya , Uraiyaasirriya Pulavar. Tamilmuthan , Mullai Nilaiyam , Chennai 17, 2014 .
3. Astap Prabaththam, Muthal Thoguthi, Sree Raganathar Uoosal, Pilai Perumal Iyengar , Ura . Vithvaan M . Narayana Velupellai, Mullai Nilaiyam, Chennai – 2 , 1996 .
4. Thakkayathubarani, Otakuthare, Uorai. U.VE. Saminathaiyar, U.VE. Saminathaiar , Noolnilaiya Pathipu , Chennai – 20 , 1960 .
5. Thandaiyaar Sathakkam, Padikasu Pulavar, Pozhippurai Pulavar, SIVA. Kaniyappan , Mullai Nilaiyam , Chennai – 1 , 1995 .
6. Thiruvagasam, Maanikkavasagar, Urai.Dhurai. Dhanapani, Uma Pathippagam Chennai-1 2007.
7. Bethagam Kuravanji, Thanjai. D.Vethanayaga Saasthiriyaar, Urai. S.Sundharasan, Mullai Nilayam, Chennai-17,2009.
8. Maduraik Kalambam, Kumarakurubar , Urai. Munaivar. Kadhirmurrugu, Saaratha Pathippagam, Chennai-14,2011.
9. Mthdholyariyam, Dhelivurai. Prrof. S.Ulaganathan, Mullai Nilayam, Chennai-17, 2010.

gad;fs; : Course Outcome

CO1	:	fyk;gfk; vDk; tif Fwpj;J tpsf;fp/ rpw;wpyf;fpa tiffSy; mJ bgUk; g';F mwpjYk;/ FkuFUguh;/ xl;lf;Tj;jh; E]y;fs; tHp g[uhzf; fijfisa[k;/ kJiu rpwg;iga[k; mwpe;J bfhs;Sjy;. Kalambagam Enum Vagai Kurithu Vilakki, Sitrilakkiya Vagaigalul Adhu Perum Pangu Aridhalum, Kumaragurubarar, Oattakkuthar Noolgal Vali Puranak Kadhaikalaiyum, Madurai Sirrapaiyum Arindhu Koludhal..
CO2	:	rptdpd; gf;jpahy; ,ilf;fhyj;nj fhiuf;fhy; mk;ikahh; vDk; bgz;;zpd; gf;jp czh;ita[k;/ jpUthrfk; ghoea khzpf;fthrfhpd; jpUr;rhHy; jUk; gf;jp czh;ita[k; g[hpyj; . ,iw bgUik mwpjy;. Sivanin Pakthiyai Idaikaalathe Kaaraikaal Ammaiya Enum Pennin Pakthi Unarvaiyum Puridhal Irai Perumai Aridhal.
CO3	:	Cry;/ rjfk; vDk; rpw;wpyf;fpa tif mwpjYk;/ rpu';fehjh; bgUik mwpjYk;. Oosal, Sadhagam Enum Sitilakkiya Vagai Aidhalum, Siranganaadhar Peumai Aridhalum.
CO4	:	Fwt";rp vDk; totpy; ,naR rpwg;g[TWk; bgj;ynfk; Fwt";rpia mwpjy;/ Fwt";rp rpw;wpyf;fpa tif mwpjy;. Kuravanji Enum Vadivil Iyesu Sirappu Koorum Bethalagame Kuravanjiyai Aridhal, Kuravanji Sitrilakkiya Vagai Aridhal.
CO5	:	gHe;jkpH; kd;dh; tPuk;/ rpwg;g[[mwpjYk; mjd; _yk; ghuk;ghpak; fhf;Fk; czh;itg; bgWjy;. Palandamil Manar Veeram, Sirapu Aridhalum Adhan Moolam Paarambarium Kaakum Unarvai Perudhal .

jhs; : 6 – ,yf;fzk; - III
Paper: 6 – Ilakkanam - III
ek;gpafg;bghUs;/ g[wg;bghUs; btz;ghkhiy
Nambiyagaporul, Purapporul Venbamalai

Total Hours	:	Course Code	
	:171606		
Credits	:	L.T.P.	:
<u>nehf;fk; :</u>			

- 138.jkpHhpd; mfthH;f;ifapd; rpwg;ig mwpe;J bfhs;Sjy;.
- 139.nghh;g;gil rpwg;ig mwpe;J bfhs;Sjy;
- 140.mwtHpapy; nggh;g[hpe;j epiyia fhzy;.

Course Objectives :

- 139.Thamizharin agavaalkaiyin sirappai arindhu kolludhal .
- 140.Porepadai sirappai arindhu kolludhal .
- 141.Aravazhiyil porepurindha nilaiyai kaanal .

myF -1 :

mfj;jpizapay; (1-93)

Alagu – 1

Agathinaiyiyal (1 – 93).

myF - 2:

mfj;jpizapay; (94-116)

xHp;gp; (KGtJk;)

Alagu – 2

Agathinaiyiyal (94 – 116)

Olipiyal (muluvadhūm).

myF - 3:

btl;rpg;glyk;/ fh";rpg;glyk;

Alagu – 3

Vetshipadalam , Kaanjipadalam .

myF - 4:

behr;rpg;glyk;/ thifg;glyk;

Alagu – 4

Nochippadalam , Vaagaipadalam .

myF - 5:

ghlhz; glyk; (bgUe;jpiz tiu)

Alagu – 5

Paadaan padalam (perundhinai varai).

ghpe;Jiu Ely;

1. ek;gpafg;bghUs; - ehw;ftpuhr ek;gp (fHf btspaPL)

2. g[wg;bghUs; btz;ghkhiy - ladhhpjdhh; (fHfbtspaPL)

Recommended Book

1. Nambiyagapporul – naarkaviraasa nimbi (kalaga veliyidu)
2. Purapporul venpaamaalai – iyanaarithanaar (kalagaveliyidu).

<http://www.tamilvu.org/ta/library-libcontnt-273141>

<https://www.panuval.com/nambiyaga-porul-10009464>

gad;fs; : Course Outcome

CO1	:	mfthH;;tpd; epy';fspd; xGf;'f';fspd; mog;gilapy; tH';fpaij fw;Wf;bfs;sy;. Agavaazhvin nilangalin olukkangalin adippadaiyil valangiyadhāi katrukkolal.
CO2	:	mfthH;;tpd; tud;Kiwf;Fl;gl;ll thH;it jkpH;g; ghuk;ghpakhf fhzy;.

		Agavaazhvin varanmuraikkutpatta vaazhvai thamizh paarampariyamaaga kaanal.
CO3	:	Mepiufspd; rpwg;g[k;/ gifthplkpUe;J ehl;ilf; fhj;jy; gad;bfhs;SjyhFk;. Aanirraikalin sirappum , pagaivaridamirundhu naatai kaathal payankolludhalagum .
CO4	:	gifthplkpUe;J vy;iykjpy;; fhg;gJk;/ btw;wp bgw;wif; bfhz;lhLjypd; Kiwia mwpjy;. Pagaivaridamirundhu ellaimadhil kaapadhum , vettri pettradhai kondaadudhalin muraiyai aridhal .
CO5	:	mwtHpapy; MSk; jd;ika[ilatiu cyfk; nghw;Wk; vd;gjd; gaid miljy;. Aravazhiyil aalum thanmaiudaiyavarai ulagam poattrum enpadhan payanai adaidhal .

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3
CO2	3	2	3	2	3
CO3	3	2	3	2	2
CO4	3	3	2	3	3
CO5	3	2	2	3	3
AVERAGE	3	2.4	2.4	2.4	2.8

**jhs;: 7 - ,yf;fpak; - IV: ePjp ,yf;fpak;
Paper: 7 – Ilakkiyam – IV: Neethi Ilakkiyam**

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

- 141.jkpH; ,yf;fpa kug[/ gpw rka/ muR Mjpf;fj;jpdhy; mw ,yf;fpa kughf khwpa gpd;dzpia czh;j;Jjy;.
- 142.ePjp ,yf;;fpa';fspd; tot khw;wj;ij mwpjy;.
- 143.mfg;g[w ghLbghUs; mwk;/ bghUs;/ ,d;gk;/ tPL vd;Dk; ghLbghUshf khwpa gpd;dzpia tpsf;Fjy;;.

Course Objectives :

- 142.Thamizh elakkiya marabu , pira samaya , arasu aathikkathinaal ara elakkiya marabaka maariya pinnaniyai vunartuthal .
- 143.Neethi elakkiyangalin vadiva maatrathai arithal .
- 144.Agappura paduporul aram , porul , enbam , veedu ennum paadu porulaga maariya pinnaniyai vilakkuthal .

myF -1 :

1. ehyoahh; mwj;Jg;ghy; - ,sik epiyahik(10 ghly;fs;)
2. gHbkhHp ehD]W - fy;tp(2 Kjy; 11 tiu) (flt[s; thH;j;J eP';fyhf)
3. Mrhuf;nfhit - xGf;fk gpiHahjth; bra;tJ (20-30 ghly;fs;)
4. KJbkhHp; fh";rp - 40 mofs; rpwe;j gj;J/ mwpt[g; gj;J/ ,y;iyag;gj;J/ vspa gj;J.

Alagu – 1

1. Naaladiyaar Arathupaal – Elamai Nelaiyamai (10 paadalgal)
2. Pazhamozhi Naanuru – Kalvi (2 Muthal 11 Varai) (Kadavul Vazhthu Ningalaga)
3. Aasarakkovai – Vozhukkam Pizhiyathavar Seivatu (20 – 30 paadalgal)
4. Muthumozhik kanghi – 40 Aadigal Siranta Pathu, Arivuppathu, Ellaipathu, Eliyappathu .

myF - 2:

1. jdpg;ghly;fs; - jdpg;ghly; jpul;L - xsitahh; 22 ghly;fs;(9/10/ 11/ 28/ 30/ 36/ 41/ 43/ 44/ 45/ 56/ 57/ 61/ 63-66).
2. cyfePjp - KGtJk; (flt[s; thH;j;J eP';fyhf)

Alagu – 2

1. Tanipadalgal – Tanipadal Thirattu – Avaiyaar 22 Paadalgal (9 , 10 , 11, 28, 30, 36, 41, 43, 44, 45, 56, 57, 61, 63 – 66).
2. Vulaga Niyati – Muzhuvatum (Kadavul Vazhthu Ningalaga)

myF - 3

jpUke;jpuk; - jpU_yh; - 5Mk; je;jpuk; (1-50 ghly;fs;)

Alagu – 3

Thirumanthiram – Thirumular – 5 Aam Thandiram (1-50 Paadalgal)

myF - 4:

gj;jpufphpahh; ghly;fs; - vf;fhyf;fz;zp - 50 ghly;fs;

Alagu – 4

Pathiragiriyar Padalgal – Eakkalakkanni -50 padalgal.

myF - 5

ePjp E]y; - kha{uk; ntjehafk; gps;is - 50 ghly;fs;

1. mjpgfhuk;; 5 (1-11 ghly;fs;)
2. mjpgfhuk;; 9 (1-10 ghly;fs;)
3. mjpgfhuk;; 23 (1-10 ghly;fs;)
4. mjpgfhuk;; 25 (1-11 ghly;fs;)
5. mjpgfhuk;; 36 (1-8 ghly;fs;)

Alagu – 5

Neethi Noolgal – Maayuram Vethanayagam Pillai – 50 Paadalgal

1. Adhigaaram; 5 (1 – 11 Paadalgal)
2. Adhigaaram ; 9 (1 – 10 Paadalgal)
3. Adhigaram; 23 (1 – 10 Paadalgal)
4. Adhigaram; 25 (1 – 11 Paadalgal)
5. Adhigaram; 36 (1 – 8 Paadalgal)

ghpe;Jiu E]y;fs;

2. cyf ePjp - ePjpf;fs";rpak; - epa{br";Rhp g[f; At[!;(gp) ypl;./ mk;gj;J]h;/ brd;id-98/ 2006.
3. jdp;ghly; jpul;L - jdp;ghly; jpul;L - xsitahh;/ m.,uhkrhkpg; g[yth; ciu/ jpUbey;ntyp/ irtrpj;jhe;j E]w;gjpg;g[f; fHfk;/ nrd;id-1/ 1964.
4. jpUke;jpuk; - jpU_yehadhh; mUspa jpUke;jpuk;/ FkuFUgud; gps;is/ \$FkuFUgud; r';fk;/ \$itFz;lk;/ 1968.
5. ePjp E]y; - kha{uk; ntjehafk; gps;is/ rPij gjpg;gfk;/ brd;id-5/ 2010.
6. gj;jpufphpahh; ghly;fs; - rpj;jh;ghly;fs; - j.nfhnte;jd;/ g{k;g[fhh; gpuRuk;/ brd;id-13/ 1976.

Recommended Book

1. Vulaga niyathi – Neetikkalangiyam – New Century Book House(P) Ltd., Ambathur, Chennai – 98, 2006.
2. Thanippaadal Tirattu – Thanipaadal Tirattu – Avvaiyar, A Ramasaamy Pulavar Vurai, Tirunelveli, Seiva Setharnta Nuurpathippu Kazhakam,Chennai – 1, 1964.
3. Thirumandiram – Thirumuula Nayanaar Aruliya Thirumandiram, Kumarakurubaran Pillai, Sree Kumara Kurubaran Sangam, Sree Vaikundam, 1968.
4. Neethi Nuulgal – Maayuram Vedhanayagam Pillai, Seethai Padippagam, Chennai – 5 , 2010.
5. Pathiragiriyaar Paadalgal – Sithar Paadalgal – t . Govendhan, Boombuhar Prasuram, Chennai 13, 1976.

ghh;it E]y;fs;

1. jpU_yhpd; - jpUke;jpu tpUe;J - jpU.rk;ge;jk;/ thdjp gjpg;gfk;/ jp.efh;/ brd;id-17/ 1990.
2. gjpbdl;Lr; rpj;jh;fSk;/ thf;Fk; - njtehj Rthkpfs;/ eh;kjh gjpg;gfk;/ brd;id-17/ 2016.

Reference Books

58. Thirumuularin – Thirumandira virunthu – Thiru. Sambantham, Vanathi Padippagam, T. nagar, Chennai – 17, 1990.
59. Pathinettuchithargalum, Vaakum – Vetha natha Swamigal, Narmatha Pathipagam, Chennai – 17, 2016.

<http://www.tamilvu.org/ta/library-l2100-html-l2100ind-128184>

<http://www.tamildigitallibrary.in/book-detail.php?id=jZY9lup2kZl6TuXGIZQdjZp1luMy&tag=%E0%AE%A4%E0%AE%BF%E0%AE%B0%E0%AF%81%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AF%81%E0%AE%B1%E0%AE%B3%E0%AF%8D%20%E0%AE%A8%E0%AF%80%E0%AE%A4%E0%AE%BF%20%E0%AE%87%E0%AE%B2%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AE%BF%E0%AE%AF%E0%AE%AE%E0%AF%8D%20%20%20%E0%AE%A4%E0%AE%BF%E0%AE%B0%E0%AF%81%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AF%81%E0%AE%B1%E0%AE%B3%E0%AF%8D%20%E0%AE%86%E0%AE%B0%E0%AE%BE%E0%AE%AF%E0%AF%8D%E0%AE%9A%E0%AF%8D%E0%AE%9A%E0%AE%BF%20%20%20Tirukkural:%20A%20Didactic%20Literature#book1/>

gad;fs; : Course Outcome

CO1	:	thH;f;ifapy; gpd;gw;w ntz;oa cah;e;j bewpfis mwpar; bra;jy;. Vazhikaiyil Pinpatra Vendiya Vuyarnta Nerigalai Ariya Seithal.
CO2	:	ePjp ,yf;fpa';fspd; tot khw;wpaj;ij mwpjy;. Neethi Elakiyangalin vadiva maatriyathai aarithal.
CO3	:	mwf; nfhl;ghLfis mwpjy;. Aarakotpadugalai arithal.
CO4	:	,yf;fpa';fs; tHp thH;f;ifia bewpg;gLj;j fw;Wf; bfhs;sy;. Elakkiyangal vazhi vaazhkaiyai neripadutha katru kollal.
CO5	:	thH;f;iff;Fj; njitahd xGf;f';fis fw;wypd; _yk; jdppkdpj xGf;fj;ij epiyehl;ly;. -Vazhikaiku Thevaiyana Vozhukangalai Katralin Mulam Thani Manitha Vuzhikkathai Nilai Natal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2
CO2	3	2	3	2	3
CO3	3	2	3	3	3
CO4	3	3	2	3	2
CO5	2	3	2	3	3

AVERAGE	2.8	2.6	2.6	2.8	2.6

**jhs; : 8 – ,yf;fzk; - IV : ahg;bgU';fyf;fhhpif/ jz;oay';fhuk;
Paper: 8 – Ilakkanam – IV: Yapperungalakkarigai, Thandiyalangaram**

**Total Hours : Course Code :
Credits : L.T.P. :**

nehf;fk; :

- 144.ahg;gpd; neh;fk; bra;a[s; vGJk; Kiwia Fwpj;J fw;gpj;jy;;.
145.,yf;fzj;jpd; cj;jpfisa[[k; tfig;ghLfisa[k; fw;W mwpa bra;jy;.
146.,s';fiy gapYk; khztpah;fSf;F Xira[lld; Toa ,iria Fwpj;J fw;gpj;jy;.

Course Objectives :

- 145.Yappin nokkam seyyul ezhuthum muraiyai kuriththu karpiththal.
146.Ilakkanaththin uththigalaiyum vagappadugalaiyum katru ariya seithal.
147.Ilangalai payilum manaviyargaluku osaiyudann koodiya isaiyai kuriththu karpiththal.

myF -1 :

vGj;J/ mir/ rPh;/ jis/ mo.

Alagu – 1

Ezhuthu, Asai, Seer, Thalai, Adi.

myF - 2:

bjhil/ Xir/ btz;gh/ Mrphpag;gh.

Alagu – 2

Thodai, Oosai, Venba, Asiriyappa.

myF - 3:

fypg;gh/ t";rpg;gh/ kUl;gh.

Alagu – 3

Kalippa, Vanjippa, Marutppa.

myF - 4:

1. jd;ikazp
2. ctikazp (gz;g[tik Kjy; khiya[tik tiu)
3. cUtf mzp (bjhifa[Utfk; Kjy; mtpatpa[Utfk; tiu)
4. gpd;tU epiyazp
5. ntw;Wikazp

Alagu – 4

1. Thanmaiyan
2. Uvamaiyan (Panbuvamai muthal Maalaiyuvamai varai)

3. Uruvaga Ani (Thogaiuruvagam muthal aruviyuruvagam varai)
4. Pinvarunilaiyani
5. Vettrumaiyani

myF - 5:

1. ntw;Wg;bghUs; itg;gzp
2. xl;lzp
3. jw;Fwpg;ngw;w mzp
4. epuy; epiwazp
5. Ritazp
6. rponylazp

Alagu – 5

1. Vetrupporul vaippani
2. Ottani
3. Tharkurippetrani
4. Niral Niraiyani
5. Suvaiyani
6. Siledaiyani

ghpe;jiu Ely;

1. ahg;gU';fyf; fhhpif - mkph;jrhfuh; (fHf btspaPL).
2. jz;oay';fhuk; - jz;o (fHf btspaPL)

Recommended Book

1. Yapperungalakarigai – Amirthasagar (Kazhaga veliyeedu).
2. Thandiyalangaram – Thandhi (Kazhaga Veliyeedu)

<http://www.tamilvu.org/ta/library-libcontnt-273141>

<https://www.youtube.com/watch?v=ybjc5WjAQcw>

<http://ggktamil.blogspot.com/2018/04/thalai.html?m=1>

gad;fs; : Course Outcome

CO1	:	md;iwa fhyfl;jjpy; thH;e;j g[yth;fspd; ,yf;fz mikjpia g[hpe;Jbfhs;Sk;go bra;jy;. Andraiya kalakattaththil vazhntha pulavargalin ilakkana amaithiyai purinthukollumpadi seidhal.
CO2	:	bra;a[s; kugpd; ,yf;fz;j;ij ,dpa Xira[k; ghliy gof;f bra;jy;. Seyyul marabin ilakkana iniya osaiyum padalai padikka seidhal.
CO3	:	,d;iwa khztpfis ehisa ftp"h;fshf cUthf;Ftjhy; kiwe;Jnghd kuig kPl;blLj;jy;. Indraiya manavigalai nalaiya kavnargalaga uruvakkuvathal marainthupona marabai meeteduththal.
CO4	:	ghtpd; Xirfis TWtjhy; gpd;dhs py; rpwe;j ghly; ghLk; jpwikia tsh;j;jy;.

		Paavin osaigalai kooruvathal pinnalil sirantha padal padum thiramaiyai valarththal.
CO5	:	brhy;y tUk; fUj;iij nehpilahfnth my;yJ kiwKfkhfnth/ bfhz;L Tl;o bghUs; Twnth/ epuy;epiw bghUs; Twhfntth vjph;kiw Twhfntth mikj;J vGJtjw;F jz;oay';fhuk; bgHpJk; gad;gLfpwJ. Solla varum karuththai neridaiyagavo (or) maraimugamagavo kondu kootti porul kooravo, niralnirai porul kooragavo ethirmarai kooragavo amaiththu ezhuthuvatharku thandiyalangaram perithum payanpadugirathu.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	2
CO2	3	2	2	2	2
CO3	3	3	3	2	2
CO4	3	2	3	2	2
CO5	3	2	3	2	2
AVERAGE	3	2.4	2.6	2.2	2

Title : **SOFT SKILLS PAPER – III**
Personality Enrichment
Subject Code : Credits:2
: 2Hours

Unit I: Determinants of Personality and Personality Traits

- Definition of ‘Personality’
- Determinants of Personality
- Personality Traits
- Big Five Personality Traits
- Related Activities

Unit II: Understanding Self: The Johari - Window

- Introduction
- Johari-Window
- Changing the Quadrants
- Related Activities

Unit III: Coping with Self Liabilities

- Common liabilities and coping with these liabilities
 - Anger
 - Shyness
 - Conflicts
- Related Activities

Unit IV: Self-Discipline

- Introduction
- Key ingredients of Self-discipline
- Conclusion
- Related Activities

Unit V: Personality Manifestation

- Non-verbal communication: a powerful tool
- Types of non-verbal communication and body language
- Psychologically proven examples of body language
- Using body language and non-verbal communication successfully.
- Do’s and Don’ts of body language
- Related Activities

Books for Reference:

1. Aurther John, *Personality Development*, Lotus Press, New Delhi, 2006.
2. Karstein, H. *Positive Thinking for Positive Living*, Focus Books, Popular Prakashan, Mumbai, 1986.

3. Khera Shiv. You Can Win. *A Step by Step Tool for Top Achievers*, Macmillan, Chennai, 1998.
4. Newstrom John W. and Edward E. Scannell, *Games Trainers Play, Experiential Learning Exercises*, Tata McGraw-Hill, New Delhi, 1980.
5. Newstrom John W. and Edward E. Scannell, *More Games Trainers Play*, Tata McGraw-Hill, New Delhi, 1980.
6. [http://en.wikipedia.org/wiki/body language](http://en.wikipedia.org/wiki/body_language).
7. <http://www.deltabravo.net/custody/body.php>.

II B.A. SEMESTER - IV

Title : **SOFT SKILLS PAPER – IV**
Basic Computer Skills & Applications

Subject code : 129004

Credits : 2

Unit I: Computer Fundamentals

- Computer Basics: Computer Hardware, Computer Software, System Software, Application Software, Utility Software, single User OS, Multi User OS

Unit II: Computer Environment

- Computer Peripherals: Input Devices, Output Devices, Secondary Storage, Windows
- Operating System: Introduction, Features, Desktop, Windows Explorer, Organizing Files and Folders – Build-in- Applications.

Unit III: MS-Word

- Creating a document, Entering text, Opening, Saving and Closing Documents, Inserting, Moving, Copying text, Search and Replacing Text, Paragraph Format, Spell Check, Page Views, Page Formats, Special Formats and Page layouts, Working with tables, Printing documents.

Unit IV: MS-Excel

- Introduction: worksheet, Cell, Range, Data Entry, Formulae Creation, Fill Command, Insertion, Deletion, Cell Row, Column, Inserting Pictures, Special Characters Objects, Charting and Mapping, Printing worksheets.

Unit V: MS-Powerpoint

- Overview: Slides, Speaker Notes, Charts, Graphs, Clipart, Editing Text, Animation, Art and Sound, Slide Show, Slide Sorter.

Text Book

1. Computer Application in Business and Management – AnanthiSheshasaayee and Sheshasaayee, Margham Publications.
2. Mastering Microsoft Office Professional for Windows Lonnie. Moseley, David M Boodey – BPB Publications.
 1. MS – Dos and Windows User Guide (Chapter 3).
 2. MS – Office Professional instant reference – Dienes.
 3. The Compact Guide to MS-Office-Mansfield.

**SEMESTER – III and IV
ENVIRONMENTAL STUDIES**

SUBJECT CODE - 174001

CREDITS: 2

COURSE OBJECTIVES

- To teach the students the importance of renewable and non renewable resources
- To enable the students to understand about biodiversity conservation and social issues
- To impart knowledge about the various ecosystems in the biome, population and environment

COURSE OUTLINE

UNIT - 1 : The multi disciplinary nature of environmental studies :

Definition , scope and importance . Need for awareness .

UNIT - 2 : Natural resources : Renewable and non renewable resources :

Natural resources and associated problems :

a . Forest resources : use and over exploitation , deforestation , case studies. Timber extraction mining , dams and their effects on forest and tribal people .

b . Water resources : use and over utilization of surface and ground water , flood, drought, conflicts over water , dams – benefits and problems .

c. Mineral resources : use and exploitation , environmental effects of extraction and using mineral resources , case studies .

d. Food Resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer – pesticide problems, water logging , salinity , case studies .

e. Energy resources : Growing energy needs , renewable and non renewable energy sources, use of alternate energy sources, case studies .

f. Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification .

Role of an individual in conservation of natural resources.
equitable use of resources for sustainable lifestyles.

UNIT -3 : Ecosystem : Concept of an ecosystem – structure and function of an ecosystem – procedures , consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains , food webs and ecological pyramids – introduction, types, characteristics features, structure and function of the following ecosystem :

a. Forest ecosystem

- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystem (ponds , streams , lakes, rivers , oceans, estuaries).

UNIT – 4 : Biodiversity and its conversation

- a. Introduction – definition : genetic, species and ecosystem diversity
- b. Biological classification of India.
- c. Value of biodiversity : consumptive use, productive use , social, ethical, aesthetic and option values.
- d. Biodiversity a global , National and local level.
- e. India as a mega – diversity nation .
- f. Hot – spots of biodiversity.
- g. threats to biodiversity : habit loss, poaching of wildlife, man wildlife conflicts.
- h. Endangered and endemic species of India .
- i. conservation of biodiversity : in-situ and EX-situ conservation of biodiversity.

UNIT -5 : Environmental pollution : Definition

- 1. causes, effects and control measures of
 - a. Air pollution
 - b. Water pollution
 - c. Soil pollution
 - d. Marine pollution
 - e. Noise pollution
 - f. thermal pollution
 - g. Nuclear pollution
- 2. Solid waste management : Causes, effects and control measures of urban and industrial water.
- 3. Role of an individual in prevention of pollution.
- 4. Pollution case studies
- 5. Disaster management : floods , earthquake , cyclone and landslides.

UNIT – 6 : Social issues and the environment

- 1. From unsustainable to sustainable development
- 2. Urban problems related to energy
- 3. Water conservation , rain water harvesting , watershed management
- 4. Resettlement and rehabilitation of people ; its problems and concerns. case studies
- 5. Environmental ethics : issues and possible solutions
- 6. climatic change , global warming , acid rain, ozone layer depletion , nuclear accidents, and holocaust. case studies .
- 7. Waste land reclamatiom
- 8. Consumption and waste products
- 9 . Air (prevention and control of pollution) act
- 10. Water (prevention and control of pollution) act
- 11. Wildlife protection act
- 12. Forest conservation Act
- 13. Issues involved in enforcement of environmental legislation
- 14. Public awareness

UNIT – 7 : Human population and the environment

- 1. Population growth , variation among nations

2. Population explosion – family welfare programs
3. Environment human health
4. Human rights
5. Value education
6. HIV / AIDS
7. Women and child welfare
8. Role of information technology in environment and human health
9. Case studies

UNIT -8 : Field work:

1. Visit to a local area to document environmental assets- river/ forest/ grassland/hill/mountain
 2. visit to a local polluted site – urban/ rural/ industrial/ agricultural
 3. study of common plants , insects, birds
- study of simple ecosystem – pond , river, hill slopes , etc
(field work equal to 5 lecture hours)

Text Books:

1. A Textbook in Environmental Science by V. Subramanian:
Narosa Publications
2. Sutrusoozhal ariviyal (Tamil book) by Chandrasekaran

Reference Books:

- 1.. Sharma P.D. 1993. Environmental Biology and Toxicology Rastogi& Co., Meerut
2. Global Environmental Change by Jonathan Graves, Longmann\
3. Fundamental Concepts in Environmental studies by D. D. Mishra, Chand Publications
4. Fundamentals of Environmental studies by Sarita Kumar, Sultan Chand Publications
- 5 Environmental Resources by A. S Mather , Longman.

Journals

- 1.Environmental Biology
2. Indian Hydrobiology
- 3.Science

E – LEARNING RESOURCES

1. www.evs.anl.gov.
2. <https://www.kilian.com>
3. <https://www.nationalgeographic.org>
4. <https://www.livescience.com>
5. <https://www.ncbi.nlm.nih.gov>

COURSE OUTCOME

CO NUMBER	CO STATEMENT
1	Get a thorough knowledge on different natural resources
2	Understand the various ecosystems with examples
3	Acquire knowledge on Biodiversity and its conservation
4	Obtain a detailed account on environment and health
5	Get a hands on experience on maintaining a garden ecosystem

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO4	PSO5
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
AVERAGE	3	3	3	3	3	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

jhs; : 9 – ,yf;fpak; : V : fhg;gpa';fs;

Paper – 9 – Ilakkiyam – V: Kappiyangal

**Total Hours : Course Code :
Credits : L.T.P. :**

nehf;fk; :

147.FWfppa bra;a[s; totk; kpf ePz;l bjhlh;epiyr; bra;a[s; totk; bgw;wj; gpd;g[yj;jpid tps';fr; bra;jy;.

148.fhg;gpa';fspd; _yk; rkz/ bgsj;j/ irt/ itzt/ fpwp!;jt/ ,!;yhkpa rka';fisa[[k;/ mjd; jkpH;j; bjhz;ila[k; g[hpar; bra;jy;.

149.fhg;gpa kug[etPd ,yf;fpakhd g[jpdj;jpy; fhzg;gLtij mwpar; bra;jy;.

Course Objectives :

148.Kurugiya Seiuul Vadivam miga Neenda Todal nilai Seiuul Vadivam petrathan pinpulathinai Vilanga seithal.

149.Kappiyangalin muulam Samana, Powthira, Saiva, Vainava, Kristuva, Eslamiya Samayangalaiuum, Athan Tamizh Tondaiuum Puuriya seithal.

150.Kappiya marabou Navina Elakkiyamana Puthinathil Kanapaduvathi ariya seithal.

myF -1 : rpyq;gjpfhuk;

1. bfhiyf;fsf;fhij - 217 mofs;
2. Jd;gkhiy - 50 mofs;
3. Ch;RH;thp - 75 mofs;
4. tHf;Fiufhij - 81 mofs;
5. t";rpdkhiy - 57 mofs;
6. mHw;gLfhij - 157 mofs;

Alagu – 1

1. Kolaikalakaathai - -217 Adigal.
2. Tunbamaalai - - 50 Adigal
3. Vuusuzhvarikaathi – 75 Adigal
4. Vazhakkuraikaathi – 81 Adigal
5. Vanjinamaalai – 57 Adigal

6. Azhrpadukaathai – 157 Adigal

myF - 2: kzpnkfiy

1. Mg[j;jpud; jpwd; mwptpj;j fhij (115 mofs;)
2. ghj;jpu kug[Twpa fhij (100 mofs;)
3. ghj;jpu'; bfhz;L gpr;ir g[f;ff;fhij (85 mofs;)

Alagu – 2: Manimegalai

1. Abuthiran Tiran Arivitha Kaathai (115 Adigal)
2. Paathira marapu kooriya kathai (100 Adigal)
3. Paathirangu kondu pichai pukkak kadhai (85 Adigal)

myF - 3:

1. rPtf rpe;jhkzp - g{kfs; ,yk;gfk; (1-51 = 51 ghly;fs;)
2. Nshkzp - Fkhufhyr; RUf;fk; (1-51 = 51 ghly;fs;)

Alagu – 3

1. Sivagachindhamani – poomagal ilampagam (1-51=51 Paadalgal)
2. Soolamani – kumaarakaalach surukkam (1-51=51 Paadalgal)

myF - 4:

1. fk;guhkhazk; - mfypifg; glyk; (1-86 = 86 ghly;fs;)
2. bghpa g[uhzk; - bka;g;bghUs; ehadhh; g[uhzk; (1-26 = 26 ghly;fs;)

Alagu – 4

1. Kambaraamayanaam – agalikaip padalam (1-86 Paadalgal)
2. Periya puraanam – meipporul naayanar puranam(1-26 = 26 Paadalgal)

myF - 5:

1. njk;ghtzp - kftUs; glyk; (76 - 150 = 74 ghly;fs;)
2. rPwhg;g[uhzk; - fjP#h fdt[fhz; glyk; (1 - 37 = 37 ghly;fs;)

Alagu – 5

1. Thembaavani – magavarul padalam(76 – 150 = 74 Paadalgal)
2. Seerappuranam – kadhija kanavukan padalam (1 – 37 = 37 paadalgal)

ghpe;Jiu E]y;fs:

1. fk;guhkhazk; (ghy fhz;lk;) - fk;gh;/ ciuahrphpah; it.K.nfhghy fpU\;zkh;rhhphahh;/ ckh gjpg;gfk;/ brd;id-01/ 2006 (Kjy; gjpg;g[])
2. rPtf rpe;jhkzp(,uz;lhk; ghfk;) - jpUj;jf;j; njth;/ ciuahrphpah; g[yth; muR/ bgh.nt.nrhkRe;judhh;/ jpUbey;ntyp/ bjd;dpe;jpa itrpj;jhe;j E]w;gjpg;g[f; fHfk;/ brd;id-18/ 1994 (Mwhk; gjpg;g[]).
3. rPwhg;g[uhzk; (Kjw;gFjp) - ckWg; g[yth;/ ciuahrphpah;/ bra;Fjk;gp ghtyh;/ ghhp epiyak;/ brd;id-108/ 2009 (Kjw; gjpg;g[]).
4. Nshkzp - njhyh bkhHpj; njth;/ c..nt.rhkpehj lah; E]y; epiyak;/ brd;id-41/ 1962 (,uz;lhk; gjpg;g[])
5. njk;ghtzp (Kjy; fhz;lk;) - tPukhdKdpth;/ ciuahrphpah; g[yth;. nf.Re;juuhrd;/ ghhp epiyak;/ brd;id-108/ 2010 (Kjw; gjpg;g[]).
6. kzpnkfiy - rPj;jiy rhj;jdhh;/ g[ypa{h;f;nfrpfd; ciu/ ghhp epiyak;/ brd;id-108.

Recommended Book

60. Kambaraamaayanam (paala kaandam) – Kambar , Vuraiyaasiriyar V.M.Gopalakrishnamachaariyar Uma padhippagam , Chennai – 01,2006 (Mudhal padhippu)
61. Seevaga chindhamani (irandaam paagam)-Thirthagath devar , Vuraiyasiriar pulavar arasu P.V.Somasundharanar Thirunelveli

62. Seerapuranam (mutharpaguthi)-umarup pulavar, uraiyaasiriyar, seiguthambi baaval ar baarinilayam, Chennai-108, 2009 (mutharpaguthi)
63. Soolaamani –thola mozhith dhevar, u.v.saaminatha iyyar nool nilayam, Chennai-41, 1962 (irandam pathippu).
64. Dhambaavani (muthar kaandam) –veeramanamunivar, uraiyaasiriyar pulavar k. sunrarasan, paari nilayam, Chennai-108, 2010 (muthar pathipu).
65. Manimegalai –seethalai saathanar, puliurkesekkan urai, paari nilayam Chennai-108.

<https://youtu.be/E7zyM6XLfzE>

https://ta.m.wikipedia.org/wiki/%E0%AE%90%E0%AE%AE%E0%AF%8D%E0%AE%AA%E0%AF%86%E0%AE%B0%E0%AF%81%E0%AE%99%E0%AF%8D_%E0%AE%95%E0%AE%BE%E0%AE%AA%E0%AF%8D%E0%AE%AA%E0%AE%BF%E0%AE%AF%E0%AE%99%E0%AF%8D%E0%AE%95%E0%AE%B3%E0%AF%8D

<http://ta.vikaspedia.in/education/ba4baebbfbb4bcd-ba8bc2bb2bcd95bb3bcd/b87bb3ba8bbfb2bc8-ba4baebbfbb4bbfbafbb2bcd-b-a-tamilology-b95bbebaabcdbaabbfbafba4bcdba4bbfba9bcd-b87bb2b95bcd95ba3baebcd-baab95bc1ba4bbf-1-baabbeb95baebcd-1>

gad;fs; : Course Outcome

CO1	:	fhg;gpa ,yf;fz';fis mwpjy;. Kappiya ilakkanamkalai arithal.
CO2	:	rka';fSf;Fk;/ fhg;gpa';fSf;Fk; ,ilapyhd bjhlh;gpidd; g[hpyjy;. Samayangalukkum, kappiyangalum idaiyilana dhodarbinaip purithal.
CO3	:	bgU';fhg;gpa';fnshL rpWfhg;gpa';fisa[k; fw;wy. Berunkaapiyangalodu serukaapiyangalaiyum katrral.
CO4	:	bra;a[s; totpy; Vw;wg;gl;l khw;wj;jpid mwpjy;. Seiyyul vadivil eatrappatta matraththinai arithal.
CO5	:	gy rka fhg;gpa';fisf; fw;wy;. Bala samaya kaapiyangalaiik katrral.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	2
CO2	3	3	2	2	3

CO3	2	3	2	3	3
CO4	3	2	3	2	2
CO5	3	3	2	2	3
AVERAGE	2.8	2.6	2.4	2.4	2.6

**jhs;: 10 - fy;btl;oay;
Thal : 10- Kalvettiyal**

Total Hours	:	Course Code
	:171610	
Credits	:	L.T.P.
nehf;fk; :		:

- 150.fy;ypy; bghwpf;Fk; fiyapd; jpwj;ijj; bjhl;fk; Kjy; jkpH;
,yf;fpa';fspy; ,lk; bgw;wtw;;iw mwpar; bra;jy;.
- 151.jkpH; vGj;Jf;fSf;F Kd;gpUe;;j vGj;J tot';fs; gjpt[bgw;w tpjj;jpid
mwpar; bra;jy;.
- 152.fy;btl;Lf;fs; jUk; bra;jpfshy; mf;fhy kd;dh;fspd; tPuk;/ g[fH;/ bfhil/
gz;ghL/ fiy tsh;r;rpia mwpar; bra;jy;.

Course Objectives :

- 151.Kallil porikkum Kalaiyin thithai thodakkam mudhal thamizh
ilakkiyangalil idam petravatrai ariyach seidhal .
- 152.Thamizh elluthukkalukku munpirundha elluthu vadivangal padhivu
petra vidhathinai ariya seidhal .
- 153.Kalvettukkal tharum cheithikalal akkaala manargalin veeram ,
Pughal , Koadai , Panpaadu , kalai valarchiyai arich seidhal.

myF -1 :

fy;ypy; bghwpf;Fk; fiyapd; njhw;wk; - eLfw;fs; - J]z;fs; kw;Wk;
jspfw;fs; - nfhtpy; fl;ol';fspy; bghwpj;j epiy - brg;gj;jfLfs; - rhd;Wfs; -
r';ffhyk;.

Alagu – 1

Kalil porikkum kalaiyin thottram – nadukarkal – thoongal matrum
thalikkarkkal – kovil kattidangalil poritha nilai – cheputhagadukkal –
saandrukkal – sangakaalam .

myF - 2:

gy;yth;fhyk; - ghz;oah;fhyk;.

Alagu – 2

Pallavarkaalam – Paandiyarkaalam .

myF - 3:

fy;btl;L mikg;g[,ay;g[k; neh;Fk; nrhHh;fhyk;.

Alagu – 3

Kalvettu amaippu iyalpum nokkum cholarkaalam .

myF - 4:

fy;btI;Lf;fspy; jkpH;vGj;J tsh;r;rp - gpuhkp vGj;J -tl;blGj;J - jkpH;vGj;JKiw - thptot khw;w';fs; - jkpH; ,yf;fpaj;jpy; fy;btI;oay; TWfs; - brg;ngLfs; - ghFghL - nghh;tpsf;ff; fy;btI;Lf;fs; - nrhH/ gy;yt ghz;oa kd;dh;fs; fy;btI;Lf;fs; jdpj;jd;ikfs;.

Alagu – 4

Kalvettukkalil thamizh eluthu valarchi – piraami eluthu – vatteluthun-thamizheluthumurai – varivadiva maatrangal – thamizh ilakkiyathil kalvettiyaal koorugal – cheppedugal – paagupaadu – poarvilakka kalvettukkal – chola , pallava pandiya mannargal kalvettukkal thanithanmaigal .

myF - 5:

fy;btI;Lf;fs; czh;j;Jk; mhpā bra;jpfs; - fy;btI;Lf;fspy; bkhHpeilf;TWfs; - mwr;bray;fis tpsf;Fk; fy;btI;Lf;fs; - tp#aefu ehaf;fh; - fy;btI;Lf;fs; ,yf;fpaf; fy;tpapy; fy;btI;Lf;fspd; g';fspg;g[.

Alagu – 5:

Kalvettukkal unarthum ariya cheithigal – kalvettukkalil mozhinadaikoorugal – aracheyalkalai vilakkum kalvettukkal – vijayanagara naayakkar – kalvettukkal ilakkiya kalviyaal kalvettukkalin pangalippu .

ghpe;Jiu E]y;

jkpH; ,yf;fpaj;jpy; fy;btI;oay; TWfs; - Kidth;. M.b#fjPrd;/ ,uhikah gjpg;gfk;/ brd;id/ 2011.

Recommended Book

Thamizh ilakkiyathil kalvettiyaal koorugal – munaivar .A . Jegatheeshan , Raamaiya pathippagam , Chennai , 2011 .

ghh;it E]y;

1. 'fy;byGj;Jf;fiy' - nguhrphpah; eld fhrpehjd;.
2. fy;btI;oay;; - f.,uhrd;.
3. fy;btI;oay;; - jkpH;g; gy;fiyf;fHfk;/ j";ir.

Reference Books

66. 'Kaleluthukkalai' – perasiriyar nadana kaasinaadhan.
67. Kalvettiyaal – K . Rasan .
68. Kalvettiyaal – Thamizh palkalaikalagam , Thanjai .

<https://www.tamiluniversity.ac.in/tamil/%E0%AE%95%E0%AE%B2%E0%AF%8D%E0%AE%B5%E0%AE%BF-2%E0%AE%AA%E0%AF%81%E0%AE%B2%E0%AE%99%E0%AF%8D%E0%AE%95%E0%AE%B3%E0%AF%8D/%E0%AE%95%E0%AE%B2%E0%AF%8D%E0%AE%B5%E0%AF%86%E0%AE%9F%E0%AF%8D%E0%AE%9F%E0%AE%BF%E0%AE%AF%E0%AE%B2%E0%AF%8D-%E0%AE%AE%E0%AE%B1%E0%AF%8D%E0%AE%B1%E0%AF%81%E0%AE%AE%E0%AF%8D-%E0%AE%A4%E0%AF%8A%E0%AE%B2/>

<https://youtu.be/nvQ8n71XQRE>

https://ta.m.wikipedia.org/wiki/%E0%AE%A4%E0%AE%AE%E0%AE%BF%E0%AE%B4%E0%AF%8D%E0%AE%95%E0%AF%8D_%E0%AE%95%E0%AE%B2%E0%AF%8D%E0%AE%B5%E0%AF%86%E0%AE%9F%E0%AF%8D%E0%AE%9F%E0%AF%81

<https://youtu.be/dNRQAKspjE>

gad;fs; : Course Outcome

CO1	:	bjhl;f fhyj;jpd; fy;bt;LfSk; mtw;wpd; gjpt[fs; gw;wp bjhp;J bfhs;sy;. Thodakka kaalathin kalvettukalum avartrin padhivugal patri therindhu kollal .
CO2	:	fy;bt;Lfspy; vGj;Jf;fspd; _yk; bkhHp tsh;r;rp epiyapidj; bjhp;J bfhs;sy;. Kalvettukalil elluthukalin moolam mozhi valarchi nizhaiyinai therindhu kollal .
CO3	:	fy;bt;Lfspd; _yk; mf;fhy rKjhaj;jpd; bfhlj; jd;ikiaj; bjhp;J bfhs;sy;. Kalvettugalin moolam akala samudhayathin kodai thanmai therindhu kollal .
CO4	:	r';f fhyj;jpy; murh; bgah;fs;/ tzpfh; bgah;/ bghUs;fspd; bgah;/ Ch;g;bgah;/ gl;lg;bgah;/ nghh;f;fUtpfspd; bgah; vd jkpHhpd; rpwg;ig brhy;tJk;; mhp gjpt[[fis bjhp;J bfhs;sy;. Snga kaalathin arasar peyargal , vanigar peyar , porulgalin peyar , oorpeyar , pattapeyar , porekaruvigalin peyar ena thamizharin sirappai solvadhuma ariya padhivugalai therindhu kollal.
CO5	:	jkpHf fy;bt;L tuyhw;Wg; gh;it;ia KGikahfj; bjhp;J bfhs;sy;. Thamizhaga kalvettu varalartru paarvaiyai mulumaiyaaga therindhu kollal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	2	3	2	2	2
CO3	2	2	3	3	3

CO4	3	2	2	3	2
CO5	3	2	2	2	2
AVERAGE	2.6	2.2	2.2	2.4	2.2

**,yf;fzk; - V: jhs; : 11 : jkpH;bkhHp tuyhW
Ilakkanam – V: Paper: 11 : Thamizh Mozhi Varalaru**

**Total Hours : Course Code :
Credits : L.T.P. :**

nehf;fk; :

- 153.jkpH; bkhHpapd; mikg;g[k; tuyhWk; mwpKfk; bra;jy;.
154.fy;btl;Lj; jkpH; bjhl';fp 20-Mk; E]w;whz;L jkpH; tiuapyhd
tsh;r;rpg; goepiyfis mwpjy;.
155.jw;fhyj;jpy; jkpHpd; brhw;bwhlh; mikg;gpYk;/ thp totj;jpYk;
Vw;gl;Ls;s khWghLfis mwpe;J bfhs;Sjy;.

Course Objectives :

- 154.Thamizh Mozhiyin Amaippum Varralarum Arimugam Seithal .
155.Kalvettuth Tamil Thodangi 20th Nootrandu Tamil Varaiyilana
Valarchi Padinilaigalai Aridhal.
156.Tharkaalathil Thamizhin Sotrodar Amaipilum , Vari Vadivathilum
Erppatula Maarupaadugalai Arindhu Kolludhal .

myF -1 :

bkhHp mikg;g[k; tuyhW -bkhHp tuyhw;Wr; rhd;Wfs; - bjhy;jpuhtpl
bkhHpa[k;/ jkpGk;.

Alagu – 1

Mozhi Amaippum Varalaru – Mozhi Varalaru Saandrugal – Tholdrravida
Mozhiyum, Thamizhum.

myF - 2:

jkpH;g; gpuhkpf; fy;btl;Lf;fspd; bkhHp - bjhy;fhg;gpaj;jkpH; - r';f
fhyj;jkpH; - r';fk; kUtpa fhyj;jkpH;.

Alagu – 2

Thamizh Piramic Kalvettugal Mozhi – Tholkaapiyathamizh – Sanga Kaalathamizh – Sangam Maruviya Kaalathamizh .

myF - 3:

gy;yth;fhyj; jkpH; - nrhHh;fhyj; jkpH; - ehaf;fh;fhyj; jkpH; - 19/ 20Mk; E]w;whz;Lj; jkpH;.

Alagu – 3

Pallavar Kaalath Thamizh – Sollarkaalathu Thamizh – Nayakka Kalar Thamizh – 19,20th Noottrandu.

myF - 4:

jkpHpy; gpwbkhHpf; fyg;g[tuyhW -jkpHpd; fpisbkhHpfSk; tuyhWk; - jkpH;r;brhw;bghUs; khw;w tuyhW.

Alagu – 4

Tamizh Piramozhi Kalapu Varalaru – Thamizhin Kilaimozhikalum Varalarum – Thamizh Sorkporul Matra Varalaru.

myF - 5:

jkpH;r;brhw;bwhlh; mikg;g[tuyhW - jkpH;thptot tuyhW.

Alagu – 5

Thamizh Chorrodar Amaippu Varalaru – Thamizh Varivadiva Varalaru.

ghpe;Jiu E]y;

1. jkpH;bkhHp tuyhW/ Kidth;. R. rf;jpnty;/ kzpthrfh; gjpg;gfk;/ brd;id/ 2006.
2. jkpH;bkhHp tuyhW/ nfh.tprauhftd;/ cyfj; jkpHhuha;r;rp epWtdk;/ brd;id.

Recommended Book

1. Tamilmozhi Varalaru, Munaivar. S. Sakthivel, Manivasagar Pathipagam, Chennai, 2006.
2. Tamilmozhi Varalaru, K. Visayaragavan, Ulagath Thamilaratchi Niruvanam, Chennai.

<http://tamilgnanavel.blogspot.com/2017/07/blog-post.html?m=1>

<http://www.tamilvu.org/ta/library-IA470-html-IA470hom-152178>

gad;fs; : Course Outcome

CO1	:	jpuhtpl bkhHpfspd; mwpKfk; bgWjy;. Dravida mozhigalin arimugal seithal.
CO2	:	jkpH;gppuhkpf; fy;btL;L Kjw;bfbhz;L fhzg;gLk; jkpH; vGj;Jf;fis mwpjy; Thamizhbrami kalvettu mutharkondu kanappadum thamizh ezhuththukkalai aridhal.
CO3	:	fhye;njhWk; bkhHpapd; tsh;r;rp khw;wj;jpid mwpjy;.

		Kalanthorum mozhiyin valarchi mattrathinai aridhal.
CO4	:	jkpH;r; brhw;bghUs; khw;w tuyhw;wpid mwpjy;. Thamizh chorporul maatra varalatrinal aridhal.
CO5	:	jkpH; thptot tuyhw;wpid mwpjy;. Thamizh varivadiva varalatrinal aridhal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3
CO2	3	2	3	2	2
CO3	3	3	3	2	2
CO4	2	2	3	3	2
CO5	2	3	3	2	2
AVERAGE	2.6	2.6	2.8	2.2	2.2

jhs; : 12 : ,yf;fpaj;jpwdha;t[
Paper : 12: Ilakkiya Thiranaivu

Total Hours	:		:	Course Code
Credits	:		:	L.T.P.

nehf;fk; :

- 156.,yf;fpa';fspd; gad;fis mwpa jpwdha;tpd; njit vd;d vd;gij tpsf;Fjy;.
- 157.czh;r;rp/ fUj;J/ fw;gid/ totk;/ nrh;e;jJjhd; rpwe;j ,yf;fpak; vd;gij
g[hpaitj;jy;.
- 158.,yf;fpa tot';fs; tpsf;fg;gl;L mtw;wpd; jdpj;jd;ikfisa[k;/
rpwg;g[fisa[k; mwpa itj;J gilg;ghf;fj; jpwdid tsh;j;jy;.

Course Objectives :

- 157.Ilakkiyyangalin payangalai ariya thiranaivin thevai enna enna
enbathai vilakkuthal.
- 158.Unarchi, karuthu, karpanai, vadivam, sernthathuthan sirandha
ilakkiyam enbadhai puriyavaithal.
- 159.Ilakkiya vadivangal vilakkappattu avartrin thanitthanmaiyaum,
sirappugalaiyum ariya vaithu padaippagath thiranai valarthal.

myF -1 :

,yf;fpa Ma;t[- jpwdha;t[- jpwdha;tpd; ,Utifg;gzp - jpwdha;t[,yf;fpak;
- ,yf;fpa kjpg;gPL - ,yf;fpaf; fiy.

Alagu – 1

Ilakkiya aaivu – thiranai – thiranaivin iruvagaippani – thiranaivu
ilakkiyam- ilakkiya mathippeedu – ilakkiyakkalai.

myF - 2:

,yf;fpa czh;r;rpfs; - fw;gid

Alagu – 2

Ilakkiya unarchigal - karpanai

myF - 3:

khdpl cz;ikfs; - totk; - fiyr;Ritf;fhfnt

Alagu – 3

Maanida unmaigal – vadivam - kalaichuvaikkaagave.

myF - 4:

ghl;L - fhg;gpak; - ehlfk

Alagu – 4

Paattu – kaapiyam - naadagam

myF - 5:

g[jpdk; - ednthilg; g[jpdk; - rpWfij - fl;Liu - ,yf;fpa , af;f';fs;.

Alagu – 5

Pudhinam – nanavodaippudhinam – sirukadhai – katturai – ilakkiya
iyakkangal.

ghpe;Jiu E]y;

,yf;fpaj;jpwdha;tpay; - jh.V."hd_h;j;jp/ le;jpizg; gjpg;gfk;/ brd;id/
2011.

Recommended Book

Ilakkiyathiranaiviyal – T.A.Gnanamoorthy, Iaindhinai padhipagam,
Chennai, 2011.

ghh;it E]y;fs;

1. ,yf;fpaj;jpwd; - lhf;lh;.K.tujuhrdhh;
2. ,yf;fpaf; fiy - m.r."hdrk;ge;jd;.
3. ,yf;fpaj; jpwdha;t[- R.ghyr;re;jpud;

Reference Books

69. Ilakkiyathiran – Dr. M.Varadharajanar.
70. Ilakkiyak kalai – A.S. Gnanasambandhan.
71. Ilakkiyath thiranaivu – S. Balachandran

https://tamililakkiyangal.blogspot.com/2012/10/blog-post_16.html?m=1
<http://keetru.com/index.php/component/content/article?id=18288:2012-02-01-10-02-07>

gad;fs; : Course Outcome

CO1	:	,yf;fpaj;ij vt;thW gog;gJ mjd; gaid Efh;tJ gw;wpa tpHpg;g[zh;it bgWjy;. Ilakkyathai evvaru padippathu adhan payanai nugarivathu patriya vizhippunarvai peruthal.
CO2	:	czh;r;rpia mog;gilahff; bfhz;IJ fiyfs;. mjd;tHp kdpj czh;t[fspd; btspg;ghlhf fw;gidnahL fye;j gilg;g[fspd; rpwg;g[fis czh;jy;. Unarchigalin adippadayaga konnda kalaigal. Adhan vazhi manitha unarvugalin velippadaga karpannaiyodu kalantha padaippugalin sirappugalai unardhal.
CO3	:	czh;r;rp/ fw;gid/ fUj;J/ totk; ehd;Fk; ,iztnj ,yf;fpak; vd;gij tps';fpf;bfhs;Sjy;. Unarchi, karpanai, karuththu, vadivam nangum inaivatheu ilakkiyam enbathai vilangikolluthal.
CO4	:	,yf;fpa';fspd; jdpj;jd;ikfis mwpe;J j';fSila gilg;g[j; jpwid tsh;j;Jf; bfhs;Sjy;. Ilakkiyangalin thaniththanmaigalai arinthu thangaludaiya padaippu thiranai valarthukolluthal.
CO5	:	gy;ntW jpwdha;t[f; fUj;Jfs; tHp jukhd ,yf;fpa gilg;g[j; jpwid bgWjy; Palvery thiranaivu karuththukal vazhi tharamana ilakkiya padaippu thiranai perudhal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	2	3	2	3
CO3	2	3	2	3	3
CO4	3	2	3	3	2
CO5	3	3	3	3	3
AVERAGE	2.8	2.6	2.8	2.8	2.8

**tpUg;gg; ghlk; - I: jhs; : 1 – ehl;Lg;g[w ,yf;fpak;
Viruppa Padam – I: Paper : 1- Nattupura Ilakkiyam**

Total Hours	:		Course Code	:
Credits	:		L.T.P.	:

nehf;fk; :

- 159.tha;bkhHp ,yf;fpa';fns ehl;Lg;g[w ,yf;fpa';fs; vd;gij vLj;Jiu;jjy;.
- 160.kf;fspd; eilKiw thH;tpy; tUk; ngr;R tHf;F ghly;fs;/ thH;tpaYf;F
Jizg[hpjiy vLj;Jiu;jjy;.
- 161.kf;fspd; ek;gpf;if/ bja;t tHpghL/ jpUtpHh/ tpisahL;L/ bjhHpy;
nghd;w midj;J tptu';fisa[k; mwpjy;.

Course Objectives :

- 160.Vaimozhi illakiyangale nattupura ilakkiyangal enbathai
eduthuraiththal.

161.Makkalin nadaimurai vazhvil varum pechu vazhakku padalgal,
vazhviyaluku thunai purithalai eduththuraiththal.

162.Makkalin nambikkai, deiva vazhipadu, thiruvizha, vilaiyattu, thozhil
pondra anaithu vivarangalaiyum arithal.

myF -1 :

ehl;Lg;g[wtpay; - ehl;Lg;g[wg; ghly;fs; - ehl;Lg;g[wf; fijfs; -
ehl;Lg;g[wf; fijg; ghly;fs;.

Alagu – 1

Nattuppuraviyal – Nattupura Padalgal – nattupura kathigal – nattupura
kathai padalgal.

myF - 2:

gHbkhHpfs; - tpLfijfs; - g[uhzf; fijfs; - ehl;Lg;g[wf; fiyfSk; iftpidg;
bghUl;fSk; - ehl;Lg;g[w ,ir.

Alagu – 2

Pazhamozhigal – Vidukathaigal – Puranak Kathaigal – Nattupura
Kalaigalum Kaivinaipporutkalum – Nattupura Isai.

myF - 3:

ehl;Lg;g[w ek;gpf;iffs; - ehl;Lg;g[wj; bja;t';fs; - ehl;Lg;g[wj;
jpUtpHhf;fs; - ehl;Lg;g[w tpisahl;Lf;fs;.

Alagu –3

Nattupura nambikkaigal – Nattupura dheivangal – nattupura
thiruvizhakkal – nattupura vilayaittukkal.

myF - 4:

ehl;Lg;g[wf; fl;lf;fiy - ehl;Lg;g[wj; bjhHpy;El;gtpay; - gad;ghl;L
ehl;Lg;g[wtpay; - kf;fs; bgauha;t[- Ch;g;bgauha;t[- fs Ma;t[Kiw -
ehl;Lg;g[w ,yf;fpaKk; vGj;jpyf;fpaKk; - ehl;Lg;g[wtpay; gs;spfs;.

Alagu – 4

Nattupura kattidakkalai – Nattupura tholilnutppamngal– payanppattu
nattupuraviyal –makal peraaviu – oorppeyaraivu – Kala Aaivu murai –
Nattupura ilakkiyamum ezhuthilakkiyamum – Nattupuravial palligal.

myF - 5:

ehl;Lg;g[wtpay; Ma;t[f; nfhl;ghLf; - ehl;Lg;g[wtpaYk; gpw ,aYk; -
ehl;Lg;g[w ,aypd; tuyhW - ,e;jpa ehl;Lg;g[w ,aypd; tuyhW - jkpHf
ehl;Lg;g[wtpaypd; tuyhW.

Alagu – 5

Nattupuraviyal Aaivuk Kotpadugal – nattupuraviyallum pira iyalum –
nattupura iyalin varalaru – India nattupura iyalin varalaru – thamizhaga
nattupuraviyallin varalaru.

ghpe;Jiu E]y:

ehl;Lg;g[w ,ay; Ma;t[- lhf;lh;. R. rf;jpnty;/ kzpthrfh; gjpg;gfk;/ rpjk;guk;.

Recommended Book

Nattupura iyal aaivu – Dr. Sakthivel, Manivasagar Pathippagam, Chidambaram.

ghh;it E]y;fs;

20. ehl;Lg;g[wg; ghly;fs; jpwdha;t[- lhf;lh; MW. mHfg;gd;.
21. jkpH; ehl;Lg;g[wtpay; Ma;t[- lhf;lh; r.nt. Rg;gpukzpad;
22. ehl;Lg;g[wtpaYk; gz;ghLk; - lhf;lh; kh.nfhjz;luhkd;
23. ehl;Lg;g[wtpay; Ma;t[fs; - lhf;lh; MW. , uhkehjd;
24. ehl;Lg;g[wtpay; rpe;jidfs; - lhf;lh; m.eh.bgUkhs;

Reference Books

- 72.Nattupura Padalgal Thiranaivu – Dr. Aru. Alagappan.
- 73.Tamil Nattuppuraviyal Aaivu – Dr. S.V. Subramanian.
- 74.Nattuppuraviyalum Panpadum – Dr. M. Kothandaraman.
- 75.Nattuppuraviyal Aaivugal – Dr. Aru. Ramanathan.
- 76.Nattuppuravial Sindanaigal – Dr. A.N. Perumal.

<https://ta.m.wikipedia.org/wiki/%E0%AE%A8%E0%AE%BE%E0%AE%9F%E0%AF%8D%E0%AE%9F%E0%AF%81%E0%AE%AA%E0%AF%8D%E0%AE%AA%E0%AF%81%E0%AE%B1%E0%AE%B5%E0%AE%BF%E0%AE%AF%E0%AE%B2%E0%AF%8D>

<https://sgmanarken.wordpress.com/2011/01/17/%E0%AE%A8%E0%AE%BE%E0%AE%9F%E0%AF%8D%E0%AE%9F%E0%AF%81%E0%AE%AA%E0%AF%8D%E0%AE%AA%E0%AF%81%E0%AE%B1-%E0%AE%87%E0%AE%B2%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AE%BF%E0%AE%AF%E0%AE%99%E0%AF%8D%E0%AE%95%E0%AE%B3/>

<https://www.tamiluniversity.ac.in/tamil/%E0%AE%B5%E0%AF%86%E0%AE%B3%E0%AE%BF%E0%AE%AF%E0%AF%80%E0%AE%9F%E0%AF%81%E0%AE%95%E0%AE%B3%E0%AF%8D-2/%E0%AE%A8%E0%AF%82%E0%AE%B2%E0%AF%8D%E0%AE%95%E0%AE%B3%E0%AF%8D-2/%E0%AE%A8%E0%AE%BE%E0%AE%9F%E0%AF%8D%E0%AE%9F%E0%AF%81%E0%AE%AA%E0%AF%8D%E0%AE%AA%E0%AF%81%E0%AE%B1%E0%AE%B5%E0%AE%BF%E0%AE%AF%E0%AE%B2%E0%AF%8D/%E0%AE%A8%E0%AE%BE%E0%AE%9F%E0%AF%8D%E0%AE%9F%E0%AF%81%E0%AE%AA%E0%AF%8D%E0%AE%AA%E0%AF%81%E0%AE%B1%E0%AE%B5%E0%AE%BF%E0%AE%AF%E0%AE%B2%E0%AF%8D-%E0%AE%93%E0%AE%B0%E0%AF%8D-%E0%AE%85/>

gad;fs; : Course Outcome

CO1	:	ehl;Lg;g[wtpay; vd;gJ tha;bkhHp ghly;fs; kw;Wk; brtp tHp fijg;ghly;fs; tHp miktij mwpjy;. Nattuppuraviyal Enbathu Varalaru Vaimozhi Padalgal Matrum Sevi Vazhi Kathappadalgal Vazhi Amaivathai Arithal.
CO2	:	fhg;gpa';fSk;/ g[uhz';fSk; TWk; fpisf; fijfis tha;bkhHpg; ghly;fs; tHp rhjhuz kf;fSk; mwpe;jpUg;gij czUjy;.

		Kappiyangalum, Puranagalum Koorum Kilaikathaigalai Vaivazhi Padalgal Vazhi Sadarana Makkalum Arinthuruppathai Unaruthal.
CO3	:	tHpghl;L Kiwfs;/ ek;gpf;iffs;/ jpUtpHhf;fs;/ tpisahl;Lf;fs; gw;wp mwpyj;. Vazhippattu Muraigal, Nambikkaigal, Thiruvizhakkal, Vilaiyattukkal Patria Arithal.
CO4	:	fpuhk kf;fspd; fl;olf;fiy gw;wpa[k;/ bjhHpy;El;gk; gw;wpa[k;/ Ch;fspd; bgah; mika[k; Kiw gw;wpa[k; mwpe;Jf; bfhs;Sjy;. Grama Makkalin Kattidakkalai Patriyum, Thozhil Nutpam Patriyum, Oorgalin Peyar Amaiyum Murai Patriyum Arinthukkolluthal.
CO5	:	jw;nghJ tsh;e;J tUk; ehl;Lg;g[wtpay; Ma;t[fSk;/ bfhs;iiffSk; gw;wp mwpe;J ehl;Lg;g[wtpay; tuyhWk;/ rpwg;g[fSk; mwpe;J khzth;fSk; ghly;fis nrfhpj;J ghJfhj;jy;. Tharpozhuthu Valarnthuvarum Nattuppuraviyal Aaivugalum, Kolgaigalum Patri Arinthu Nattuppuraviyal Varalarum, Sirappugalum Arinthu Manavargalum Padalgalai Segarithu Pathukaththal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	2	3	2	3	2
CO3	3	3	3	3	3
CO4	3	2	3	2	3
CO5	3	3	3	3	2
AVERAGE	2.8	2.8	2.8	2.8	2.6

rh;g[g; ghk; - I : jhs; : 1 – jkHf tuyhW kf;fSk; gz;ghLk; - I
Saambu Padam–I: Paper : 1 : Thamizhaga Varalaru Makkalum Panpadum
– I

Total Hours :
:171691

Credits :

Course Code

L.T.P. :

nehf;fk; :

- 162.jkpHf tuyhw;Wf;fhd mog;gil Mjhu';fs;/ jkpHfj;jpd; ,aw;if mikg;g[fs;/ tuyhw;Wff;F Kd;g[jkpHfj;jpd; epiy/ rpe;Jbtsp Muha;;r;rp Mfpait gw;wp mwpar; bra;jy;.
- 163.gz;ilj; jkpHhpd; may;ehl;Lj; bjhlh;g[fs; Fwpj;Jk; r';fk; itj;J jkpH; tsh;j;j bgUik Fwpj;Jk; tpsf;Fjy;.
- 164.r';f ,yf;fpa';fspd; thapyhfg; gz;ilj; jkpHhpd; thH;f;ifapidj; bjspt[gLj;jy;. nkYk;/ fsg;gpuh;-gy;yth;fs; gw;wpa[k; ehd;fhk; E]w;whz;L Kjy; xd;gjhk; E]w;whz;L tiu jkpHfj;jpd; r_f epiy gw;wpa[k; mwpjy;.

Course Objectives :

- 163.Tamizhaga Varalaatrukaana Adippadai Aatharangal, Tamizhagathin Iyarkai Amaippugal, Varalaatrucku Munbu Tamizhagathin nelai, Sindhuveli Araichi Aagiyavai patri ariya seithal.
- 164.Pandai Tamizharin Ayal Naatu Todarbugal Kurithum Sangam Vaithu Tamizh Valartha Perumai kurithum vilakkuthal.
- 165.Sanga Ilakkiyangalin Vaayilaaga Pandai Tamizharin Vazhikaiyenai Telivu paduthal. Melum, Kalapirar – Pallavargal patriyum Naangaam Nootrandu Varai Tamizhagathin Samuga nelai Patriyum arithal.

myF -1 :

jkpHf tuyhw;Wf;fhd mog;gil Mjhu';fs;- jkpHfj;jpd; ,aw;if mikg;g[fs; - tuyhw;W fhyj;Jf;F Ke;jpa jkpHfk; - rpe;Jbtsp Muha;r;rp.

Alagu – 1

Tamizhaga Varalaatrukkaana Adippadai Aatharangal – Tamizhagathin Iyarkai Amaippugal – Varalaatru Kaalathukku Munthaiya Tamizhagam – Sindhuveli Araichi.

myF - 2:

gz;ila jkpHhpd; may;ehl;Lj; bjhlh;g[fs; - jkpH; tsh;j;j r';fk; - r';f ,yf;fpak;.

Alagu – 2

Padaiya Tamizharin Ayalnaatu Todarbugal – Tamizh Valartha Sangam – Sanga Ilakkiyam.

myF - 3:

r';f ,yf;fpak; - gz;ilaj; jkpHhpd; thH;f;if.

Alagu – 3

Sanga Ilakkiyam – Pandaiya Tamizharin Vazhkai.

myF - 4:

gz;ila jkpHhpd; thH;f;if - fsg;gpuh;fs; - gy;yth;fs;.

Alagu – 4

Pandaiya Tamizharin Vazhkai – Kalappirargal – Pallavargal.

myF - 5:

gy;yth;fs; - jkpHfj;jpy; ehd;fhk; E]w;whz;L Kjy; xd;gjhk; E]w;whz;L
tiu r_fepiy.

Alagu – 5

Pallavargal – Tamizhagathil Naangaam Nootrandu Muthal Vonbatham
Nootrandu Varai Samuganelai.

ghpe;Jiu E]y;

jkpHf tuyhW kf;fSk; gz;ghLk; - nf.nf.gps;is/ cyfj; jkpHhuha;r;rp
epWtdk;/ brd;id.

Recommended Book

Tamizhaga Varalaru Makkalaum – K. K. Pillai, Vulaga Tamizharaichi
Niruvanam, Chennai.

ghh;it E]y;fs;

1. jkpHh; ehfhpfKk; gz;ghLk; - lhf;lh; m.jl;rz_h;j;jp
2. jkpHf tuyhWk; jkpHh; gz;ghLk; - lhf;lh; M. ,uhkfpUl;ozd;.
3. jkpHf tuyhWk; gz;ghLk; - lhf;lh; nt.jp. bry;yk;

Reference Books

- 77.Tamizhar naagarigamum Panpaadum – DR. A.Dhatchana moorthy
- 78.Tamizhaga varalarum tamizhar Panpaadum – DR. A. Ramakrishnan
- 79.Tamilaga varalarum Panpaadum – DR. V. D. Chellam

<https://www.udumalai.com/thamilaga-varalarum-panpaadum.htm>

<https://www.goodreads.com/book/show/18463252-tamil-varalarum-tamilar-panpaadu>

gad;fs; : Course Outcome

CO1	:	jkpHf tuyhw;Wr; rpwg;gpId Mjhu';fSld; mwpe;J bfhs;Sjy; kw;Wk; jkpHfj;jpd; ,aw;if mikg;gpd; rpwg;gpId tpsf;fp mikjy;. Thamizhaga varalartru sirappinai aatharangaludan arindu koludhal matttrum thamizhagathinn iyarkai amaipin sirappinai vilakki amaidhal.
CO2	:	tuyhw;Wf; fhyj;jpw;F Kd;gpUe;j jkpHfj;jpd; epiyapidg; g[yg;gLj;Jjy;. nkYk;/ jkpHh;fs; may;ehl;Lj; bjhlh;gpy; rpwe;J tps';fpdh; vd;gijj; bjspt[gLj;jy;. Varalatra kaalathirukku munpirundha thamizhagathin nilaiyinai pulappaduthudhal melum, thamizhlargal ayal naatuth thodarpil sirandhu vilanginar enbadhai thelivu paduthudhal

CO3	:	r';fk; itj;J jkpH; tsh;j;j rpwg;gpida[k; r';f ,yf;fpa';fspd; rpwg;gpida[k;/ gz;ilj; jkpHhpd; thH;f;if epiyapida[k; tpsf;Fjy;. Sangam vathu tamizh valartha sirappinaiyum sanga ilakkiyangalin sirappinaiyum , pandai tamizharin vaalkai nilaiyinaiyum vilakkudhal
CO4	:	fsg;gpufSk; gy;yth;fSk; jkpHfj;jpy; epfH;j;jpa khw;w';fs; Fwpj;J tpsf;Fjy;. Kalappirakallukku pallavargalum tamilagathil nigalthiya martrangal kurithu vilakkudhal .
CO5	:	jkpHfj;jpy; 4-Mk; E]w;whz;L Kjy; 9-Mk; E]w;whz;L tiu r_fepiy kpft[k; khw;wk; bgw;wikia czh;j;jy;. Thamizhathin 4 - aam nootrandu muthal 9 – aam nootrandu varai samuganilai migavum maatram pettramaiyai unardhal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	2
CO2	2	3	3	2	3
CO3	2	3	2	3	2
CO4	3	2	3	3	2
CO5	3	2	3	2	3
AVERAGE	2.6	2.5	2.8	2.6	2.5

rrh;g[g; ghlk; - II: jhs; : 2 – jkpHf tuyhW kf;fSk; gz;ghLk; - II
Sarbu Padam–II : Paper : 2– Thamizhaga Varalaru Makkalum Panpadum
- II

Total Hours	:	Course Code
	:171692	
Credits	:	L.T.P.
nehf;fk; :		:

- 165.nrhHg; nguurpd; njhw;wk; kw;Wk; tsh;r;rp/ tPH;r;rp Fwpj;Jk;
 nrhHh; fhyj;jpy; jkpHhpd; rKjhak; ,Ue;j epiy Fwpj;Jk; tpsf;Fjy;.
- 166.ghz;oahpd; Vw;wk;/ tPH;r;rp kw;Wk; kJiu ehaf;fh;fs; gw;wp
 mwpjy;. nkYk;/ 13-Mk; E]w;whz;L Kjy; 18-Mk; E]w;whz;L tiu
 jkpHfj;jpd; r_fepiy gw;wpa[k; mwpjy;.
- 167.Inuhg;gpah;fspd; tut[/ 19Mk; E]w;whz;od; murpay; ghz;ika[;
 jkpHfj;jpy; r_f epiya[k; Fwpj;J tpsf;Fjy;.

Course Objectives :

- 166.Chola perarasin thotram mattrum valarchi, veezhchi kurithum
 Chozhar kaalathil Thamizharin samuthayam iruntha nelai kurithum
 vilakkuthal.
- 167.Pandiyarin yettram, veezhchi mattrum Madurai Nayakkargal patri
 arithal. Melum, 13 – aam Nootrandu muthal 18 – Nootrandu varai
 Tamizhgathin samuga nilai patriuum arithal.
- 168.Iropiyargalin varavu, 19 aam Nootrandin Arasiyal Panmaiym
 Tamizhagathil Samuga nilaium kurithu vilakkuthal.

myF -1 :

nrhHg; nguurpd; njhw;wk; - nrhHg; nguurpd; tsh;r;rpa[k;
 tPH;r;rpa[k;.

Alagu – 1

Chozha Perarasin thotram – Chozha Perarasin valarchiyum Veezhchiyum.

myF - 2:

nrhHh; fhyj;jpy; jkpHhpd; rKjhak;.

Alagu – 2

Chozhar Kaalathil Tamizharin Samuthayam.

myF - 3:

nrhHh; fhyj;jpy; jkpHhpd; rKjhak; - ghz;oahpd; Vw;wKk;
 tPH;r;rpa[k; - kJiu ehaf;fh;fs;.

Alagu – 3

Chozhar Kaalathil Tamizharin Samuthayam – Pandiyarin yeatramum Veezhchiyum – Madurai Nayakkargal.

myF - 4:

jkpHfj;jpy; 13 Kjy; 18-Mk; E]w;whz;L tiu r_fepiy - Inuhg;gpahpd; tut[- gj;bjh;gjhk; E]w;whz;od; murpaYk; jkpHfj;jpd; r_f epiya[k;.

Alagu – 4

Tamizhagathil 13 muthal 18 – aam Nootrandu varai Samuga nilai – Iroppiyarin varavu – Pathonpatham Nootrandin Arasiyalum Tamizhagathin Samuga nilaiyum.

myF - 5:

gj;bjh;gjhk; E]w;whz;od; murpaYk; jkpHfj;jpd; r_f epiya[k; - ,Ugjhk; E]w;whz;oy; jkpHfk;.

Alagu – 5

Pathonbatham Nootrandin Arasiyalum Tamizhagathin Samuga nilaiyum – Irubatham Nootrandil Tamizhagam.

ghpe;Jiu E]y;

jkpHf tuyhW kf;fSk; gz;ghLk; - nf.nf.gps;is/ cyfj; jkpHhuha;r;rp epWtdk;/ brd;id.

Recommended Book

Tamizhaga Varalaaru Makkalum Panbadum – K. K. Pillai, Vulaga Tamizharaichi Niruvanam, Chennai.

ghh;it E]y;fs;

1. jkpHh; ehfhpfKk; gz;ghLk; - lhf;lh; m.jl;rzh_h;j;jp
2. jkpHf tuyhWk; jkpHh; gz;ghLk; - lhf;lh; M. , uhkfpUl;ozd;.
3. jkpHf tuyhWk; gz;ghLk; - lhf;lh; nt.jp. bry;yk;

Reference Books

- 80.Tamizharin Nagarigamum Panpadum – DR. A. Dhatchana moorthy.
- 81.Tamizhaga Varalaarum Tamizhar Panpaadum – DR. A. Ramakrishnan.
- 82.Tamizhaga Varalaarum Panpaadum – DR. V. T. Sellam.

<https://www.goodreads.com/book/show/18463252-tamil-varalarum-tamilar-panpaadu>

<https://www.udumalai.com/thamilaga-varalarum-panpaadum.htm>

gad;fs; : Course Outcome

CO1	:	nrhHg; nguurpd; njhw;wk; gw;wpa[k; tsh;r;rp tPH;r;rp gw;wpa[k; ed;F mwpjy; Chozha Perarasin Totram Patriyum Valarchi Veezhchi partriyum nangu arithal.
CO2	:	nrhHh; fhyj;jpy; jkpHhpd; rKjhak; bgw;wpUe;j nkd;ik epiyapid czh;j;Jjy;.

		Chozhar Kaalathil Tamizharin samuthayam petrirunta meanmai nelaiyenai vunarthuthal.
CO3	:	ghz;oahpd; Vw;wk; Fwpj;Jk; tPH;r;rp Fwpj;Jk; kJiu ehaf;fh;fspd; jpwd; Fwpj;Jk; tpHpg;g[zh;t[bgwr; bra;jy;. Pandiyarin yetram kurithum Veezhchi kurithum Madurai Nayakkargalin thiran kurithum Vezhippunarvu pera seithal.
CO4	:	jkpHfj;jpy; 13-Mk; E]w;whz;L Kjy; 18-Mk; E]w;whz;L tiu r_fepiy vt;thW khw;wk; bgw;wpUe;jJ vd;gjid czh;j;Jjy;. Tamizhgathil 13 – aam Nootraandu muthal 18 – aam Nootrandu varai Samuga nelai yeavaaru maatram petrirunthatu yenpathai vunarthuthal.
CO5	:	Inuhg;gpah;fspd; tUif kw;Wk; 19-Mk; E]w;whz;od; murpay; epytuk;/ jkpHfj;jpd; r_fepiy Mfpait gw;wp tpsf;fp mikjy;. Iropiyargalin varugai Matrum 19 – aam Nootrandin Arasiyal Nilavaram, Tamizhagathin Samuganelai Aagiyavatrai patri vilakki amaithal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	3	2
CO2	3	2	3	2	3
CO3	2	3	3	3	2
CO4	3	2	2	2	3
CO5	2	2	3	3	3
AVERAGE	2.5	2.5	2.6	2.6	2.5

rhg;g[ghlk;- III: jhs; : 3- jkpH; ,yf;fpa tuyhW - I
Sarbu Padam – III: Paper: 3-Thamizh Ilakkiya Varalaru - I

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

- 168.jkpHpd; bgUik/ bjhd;ik/ jkpHpy; njhd;wpa ,yf;fpa';fspd; jd;ik
nghd;wtw;iw mwpKfg;gLj;Jjy;.
- 169.gHe;jkpH; ,yf;fpa';fs; bkhHp tsh;r;rpF tpj;jpl;l tpjj;ija[k;/
rKjhaj;ij gpujpygpg;gija[k; vLj;Jf; TWjy;.
- 170.fhye;njhWk; ,yf;fpa tot';fspy; njhd;wpa khw;w';fisa[k;/ mjd;
cl;bghUl;fspd; jd;ikfSk; gw;wp tpsf;fpa[iuj;jy;.

Course Objectives :

- 169.Tamizhin perumai , Thonmai , Tamizhil thontriya Ilakkiyagal
thanmai pontravatrai arimugapaduthuthal .
- 170.Pazhatamil ilakkiyagal mozhi valarchikku viththitta vithathaiyum ,
Samuthaayaththai perathippalipathaiyum yaduthu kuruthal .
- 171.Kaalathorum ilakkiya vadivagalayum thontriya maatragalai , athan
uitporitgalin thanmaigalum patri vilakkiuraithal .

myF -1 :

jkpH;bkhHp - jkpH; ,yf;fpak; - jkpH; ,yf;fpa tuyhw;Wf;fy;tp;

Alagu – 1

Tamilmozhi – Tamil ilakkiyam – Tamil ilakkiya varalatrakalvi

myF - 2:

bjhy;fhg;gpak; - r';f ,yf;fpak

Alagu – 2

Tholkappiyam – Sanga ilakkiyam

myF - 3:

mw ,yf;fpak;

Alagu – 3

Ara ilakkiyam

myF - 4:

fhg;gpa ,yf;fpak; - gf;jp ,yf;fpak;

Alagu – 4

Kapiya ilakkiyam – Bakthi ilakkiyam

myF - 5:

rpw;wpf;fpak;

Alagu – 5

Chitrilakkiyam

ghpe;Jiu E]y;:

1. jkpH; ,yf;fpa tuyhW - Kidth;. r.nt. Rg;gpukzpad;/ kzpthrfh; gjpg;gfk;/ brd;id/1999.
2. jkpH; ,yf;fpa tuyhW - b#ak; re;jpunyfh it;jpaehjd;.

Recommended Book

1. Tamil ilakkiya varalaru – Munaivar . S.V.Subiramaniyan , Manivasakar pathipakam , Chennai , 1999.
2. Tamil ilakkiya varalaru – Jayam Santhiralekha vaithiyanathan.

ghh;it E]y;fs;

1. jkpH; ,yf;fpa tuyhW - Kidth;. K.tujuhrd;.
2. jkpH; ,yf;fpa tuyhw;Wf; fs";rpak; - nguh.kJ.R. tpkyhde;jk;
3. g]jpa neh;fpy; jkpH; ,yf;fpa tuyhW - Kidth;. jkpHz;zy;.
4. jkpH; ,yf;fpa tuyhW - kJ.r. tpkyhde;jk;.
5. jkpH; ,yf;fpa tuyhW - gz;ojkzp. K. fjpnr brl;oahh;.

Reference Books

- 83.Tamizh Ilakiya Varalaru – Munaivar. M. Varatharasan.
- 84.Tamizh Ilakiya Varalathru Kalanjiyam – Pro. M. T. S. Vimalaanandam.
- 85.Putiya nokil Tamizh Ilakiya Varalaaru – Munaivar. Tamizhannal.
- 86.Tamizh Ilakiya Varalaru – M.T.C. Vimalaanadam.
- 87.Tamizh Ilakiya Varalaru – Pandithamani M. Kathiresa setiyaar.

<https://ta.m.wikipedia.org/wiki/%E0%AE%A4%E0%AE%AE%E0%AE%BF%E0%AE%B4%E0%AF%8D%E0%AE%87%E0%AE%B2%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AE%BF%E0%AE%AF%E0%AE%B5%E0%AE%B0%E0%AE%B2%E0%AE%BE%E0%AE%B1%E0%AF%81%E0%AE%A8%E0%AF%82%E0%AE%B2%E0%AF%8D>

gad;fs; : Course Outcome

CO1	:	jkpH;bkhHpapd; bgUikiaa[k;/ gHikiaa[[k; Twp bkhHpg;gw;iw tsh;j;jYk;/ bkhHp mwpit tsh;j;jYk;. Tamizhmozhiyin Perumaiyaiyum , Pazhamaiyaiyum kuuri Mozhippatrai Valarthalum, Mozhi Arivai valarthalum.
CO2	:	jkpHpy; Kjypy; fpil;j ,yf;fz E]y; gw;wp mwpjYk;/ mjd;go bkhHpapd; mikg;g[tiuaiwfs; rpwg;g[bgWjYk;/ mjd;tHp

		mike;j ,yf;fpa';fis mwpe;J mf;fhy rKjhaj;jpiz/ mjd; bgUikia g[hpe;Jbfhs;Sjy;. Tamizhil muthalil kidaitha Ilakana Nool Patri Arithalum, athanpadi Mozhiyin Amaippu Varaiyaraigal sirappu peruthalum, athanvazhi amaintha Ilakkiyangalai arintu Akkaala Samuthayathinai, athan perumaiyai purinthukolluthal.
CO3	:	fhyr; NHypy; tuyhW murpayikg;g[khw;wk;/ ,yf;fpa ghLbghUis khw;wpaikj;jiy mwpjy;/ jkpHh; jk; thH;tpay; mwpit tpsf;Fjy;. Kaala suzhalil Varalaaru Arasiyalamaippu maathram, Ilakkiya paaduporulai maatriyamaithalai arithal, Tamizhar Tam Vazhiviyal arivai vilakkuthal.
CO4	:	ntbwhL fij totkha; ,yf;fpak; gilf;fg;gl;lija[k;/ md;iwa rKjha thH;ita[kk;/ gf;jp czh;t[/ flt[s; bfhs;iffisa[k; mwpjy;. Verodu Kathai vadivamai Ilakiyam Padaikkapaathathiyum, Anraiya Samuthaya Vazhavaiyum, Bakthi Vunarvu, Kadavul Kolkaikalaiyum arithal.
CO5	:	tuyhw;W khw;wk; ,yf;fpa khw;wk; jUtij mwpe;J md;iwa rKjhaj;iig; g[hpe;J bfhs;Sjy;. Varalaatru Maatram Ilakiya Mattram taruvathai arintu andraiya Samuthaayathi purintu kolluthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	2	3	2	3
CO3	2	3	2	3	2
CO4	3	3	3	3	3
CO5	3	2	3	2	2
AVERAGE	2.8	2.6	2.6	2.6	2.6

rhg;g[g;ghlk;- IV: jhs; : 4- jkpH; ,yf;fpa tuyhW - II
Sarbu Padam – IV: Paper: 4 - Thamizh Ilakkiya Varalaru - II

Total Hours	:	Course Code	:	
Credits	:	L.T.P.	:	

nehf;fk; :

- 171.tsh;e;J tUk; ,yf;fpa tiffs;/ totk; cs;sPL/ ghL bghUl;fs; khw;wKk; mij btspg;gLj;Jk; gpw;fhy ,yf;fpa';fs; tpsf;fg;gLjy;.
- 172.jw;fhy ,yf;fpa tsh;r;rpapd; gpd;dzp/ tiffs;/ tot';fs;/ jkpHpd; epiy/ tsh;r;rp/ Jiw njhWk; E]y;fs; Fwpj;J g[hpa itj;jy;.
- 173.rKjhag; gpd;dzp fhuzkhf rKjhag; gad; jUk; tpjkhf jkpH; gy;tpj tsh;r;rpaille;J tUjiy mwpjYk;/ g';fspf;Fk; jpwd;fisg; bgw itj;jYk;.

Course Objectives :

- 172.Valarnthu Varum Ilakkiya Vagaigal, Vadivam Ulleedu, Padu Porutkal Matramum Athai Velippaduththum Pirkala Ilakkiyangal Vilakkapaduthal.
- 173.Tharkala Ilakkiya Valarchiyin Pinnani, Vagaigal, Vadivangal, Thamizhin Nnilai, Valarchi, Thurai Thorum Noolgal Kuriththu Puriya Vaiththal.
- 174.Samudaya Pinnani Karanamaga Samudaya Payan Tharum Vithamaga Thamizh Palvidha Valarchiyadainthu Varuthalai Arithalum, Pangalikkum Thirangalai Pera Vaiththalum.

myF -1 :

ciuahrrphah;fs; ,yf;fzKk;/ epfz;Lk; - jdp;ghly;fSk;/ gpw;fhyg; g[yth;fSk;.

Alagu – 1

Uraiyasiriyargal Ilakkanamum, Nigandum – Thanipadalgalum, Pirkala Pulavargalum.

myF - 2:

rkak; tsh;j;j jkpH; - btspehLfs; je;j ,yf;fpak;

Alagu – 2

Samayam valartha thamizh – Velinadugal thantha ilakkiyam.

myF - 3:

ehlf ,yf;fpak; - fij ,yf;fpak; - ciueil ,yf;fpak;.

Alagu – 3

Nadaga Ilakkiyam – Kathai Ilakkiyam – Urainadai Ilakkiyam.

myF - 4:

,f;fhyf; ftpij ,yf;fpak; - g[Jf;ftpj - ehl;lhh; ,yf;fpak; - Rtoapay;.

Alagu – 4

Ikkala Kavithai Ilakkiyam – Puthikavithai – Nattar Ilakkiyam – Suvadiyiyal.

myF - 5:

gjpg;gf';fs; - ,jH;fs; - epWtd';fs; - FHe;ij/ rpWth; ,yf;fpa';fs; - khehLfs;/ fUj;ju';Ffs; - iAf;T ftpijfs; - gyJiwfs;py; jkpH;.

Alagu – 5

Pathippagangal – Idhazhgal – Niruvanangal – Kuzhanthai, Siruvar Ilakkiyangal – Manadugal, Karuththarangugal – Hichoo Kavithaigal – Palthuraigali Thamizh.

ghpe;Ji Ely;

jkpH; ,yf;fpa tuyhW - Kidth;. r.nt.Rg;gpukzpad;/ kzpthrfh; gjpg;gfk;/ brd;id/ 1999.

Recommended Book

Thamizh Ilakkiya Varalaru – Prof. S.V. Subramaniam, Manivasagar Pathippagam, Chennai, 1999.

ghh;it Ely;fs;

6. jkpH; ,yf;fpa tuyhW - Kidth;. K.tujuhrd;.
7. jkpH; ,yf;fpa tuyhw;Wf; fs";rpak; - nguh.kJ.R. tpkyhde;jk;
8. g[jpa neh;fpy; jkpH; ,yf;fpa tuyhW - Kidth;. jkpHz;zy;.

Reference Books

- 88.Thamizh Ilakkiya Varalaru – Prof. M. Varadharasan.
- 89.Thamizh Ilakkiya Varalatu Kalanjiam – Prof. M.D.S. Vimalanathan.
- 90.Puthiya Nokkil Thamizh Ilakkiya Varalaru – Prof. Thamizhannal.

https://ta.m.wikipedia.org/wiki/%E0%AE%A4%E0%AE%AE%E0%AE%BF%E0%AE%B4%E0%AF%8D_%E0%A%87%E0%AE%B2%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AE%BF%E0%AE%AF_%E0%AE%B5%E

gad;fs; : Course Outcome

CO1	:	,ilf;fhy ,yf;fpa';fspd; jd;ika[k; rKjhar; NHiya[k; mwpe;J bfhs;Sjy;. gHe;jkpH; brhw;bghUs; czUk;go cs;s epfz;Lfis mwpjy;/ ,yf;fz';fis mwpe;J gad; bgWjy;. Idaikkala Ilakkiyangalin thanmaiyum samudaya soozhalaiyum arinthu kolluthal. Pazhanthamizh sorporul unarumbadi ulla nigandugalai arithal, ilakkanangalai arinthu payan peruthal.
CO2	:	gy;ntW rka';fs; jkpH; ,yf;fpa';fs; Cnl jkpiHa[k;/ rkaj;ija[[k; vt;thW tsh;j;jdh; vdmwpjy;. Palveru samayangam thamizh ilakkiyangal Oode thamizhaiyum, samayaththaiyum evvaru valarththanar ena arithal.
CO3	:	fhy khw;wk;/ murpay; khw;wk;/ jkpH; ,yf;fpa totj;ij khw;wpaikj;jija[k;/ Rtoapy; vGJk; ,lh;ghL eP';fpaJk; totkhw;wk; bgWjiy mwpjy;. Kala mattram, Arasiyal Mattram, thamizh Ilakkiya vadivaththai matriyamaiththathaiyum, suvadiyil ezhuthum idarpadu neengiyathum vadivamattiriyam peruthalai arithal.
CO4	:	kf;fspd; gytpj epiyfisa[k;/ thH;tpaiya[[k; jw;fhy rKjha gpur;ridfisa[k; gilg;g[fspd; tHp mwpjy;. Makkalin palavidha nilaigalaiyum, vazhviyalaiyum tharkala samudaya prachanaigalaiyum padaippugalin vazhi aridhal.
CO5	:	gy Jiwfspy; jkpH; g';fspg;igj; je;J rKjhak; Kd;ndwt[k; jkpH; tsut[[k; cs;s NHiyg; g[[hpjy;/ gilg;g[fspy; g';fspf;f Kaw;rp bra;jy;. Pala thuraigalil thamizh pangalippai thanthu samudayam munneravum thamizh valaravum ulla soozhalai purithal, padaippugalil pangalikka muyarchi seithal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	1	3	3	2	3
CO3	2	3	3	2	2

CO4	3	3	3	3	2
CO5	3	3	3	3	2
AVERAGE	2.4	3	3	2.6	2.4

**jhs;: 15 - jpuhtpl bkhHpfspd; xg;gha;t[
Paper: 15 – Dravida Mozhigalinn Oppaivu**

Total Hours : **Course Code** :
Credits : **L.T.P.** :

nehf;fk; :

174.jpuhtpplbkhHpfisj; bjhpe;J bfhs;sy;.

175.jpuhtpl bkhHpfSf;bfy;yhk; jkpH; jhahf tps';Fkhw;iw mwpjy;.

176.jpuhtpl bkhHpfSf;Fs; fhzyhFk; ,yf;fz xw;Wikia fw;wy;.

Course Objectives :

175.Dravida mozhigalai therinthu kollal.

176.Dravida mozhigalukkellam thamizhh thayaga vilangumattrai arithal.

177.Dravida mozhigalukkul kanalagum ilakkana ottrumaiyai kattral.

myF -1 :

bkhHpa[k; bkhHpapaYk; - tuyhw;Wf;F Kw;gl;l bkhHpepiy Ma;t[- jpuhtpl bkhHpf; FLk;g xg;gha;tpd; tuyhW - jpuhtpl bkhHpfSk; cl;gphpt[fSk; - bjd;jpuhtpl bkhHpfS; - eLj;jpuhtpl bkhHpfS; - tljpuhtpl bkhHpfS;

Alagu – 1

Mozhiyum mozhiiyalum – varalatrukku murpatta mozhi nilai Aaivu – Dravida mozhi kudumba oppaivin varalaru – Dravida mozhigalu, utpirivugalum – thendravida mozhigal – nadudravida mozhigal – vadadravida mozhigal.

myF - 2:

xypa[k; gpwg;g[k; - capbuhypfspd; ,iag[k; jphpg[k; - xypkhw;w';fs; (capbuhypfs;)

Alagu – 2

Oliyum pirappum – uyiroligal iyaibum thiribum – olimatrangal (Uyiroligal)

myF - 3:

bka;bahypfspd; , iag[k; jphpg[k; - bka;bahyp khw;w';fs;.

Alagu – 3

Meiyoligalin iyaibum thirubum – meiyoli mattrangal.

myF - 4:

cUgd;fSk; brhy;yhf;fKk; - bgah;r;brhw;fs; jpiz/ ghy;/ vz; czh;j;Jk;Kiw
- ntw;Wikfs; - _tplg; bgah;fs; - vz;Qg;bgah;fs;.

Alagu –4

Urubangalum sollakkamum – peyarchol thinai, pal, enn unarththum murai
– vetrumaigal – moovida peyargal – ennuppeyargal.

myF - 5:

tpidr;brhw;fspd; mikg;g[k; rpwg;g[k; - tpid tiffs; - tpidr;brhw;fs; fhyk;
fhl;Lk; Kiw vr;r';fSk; Kw;Wf;fSk; - tpidaohf epw;Fk; bgah;fs; -
tpidg;bgHl;fs; - jphhtpl bkhHpfspd; bjhluikg;g[.

Alagu – 5

Vinaisorkalinn amaippum sirappum – vinnai vagaigal – vinaisorkal kalam
kagum murai echangalum mutrukkalum – vinaiyadiyaga nirrkum peyargal –
vinaiporutkal – Dravida mozhigalin thodaramaippu.

ghpe;Jiu Ely:

jpuhtpl bkhHpfspd; xg;gha;t[Xh; mwpKfk;/ lhf;lh;. #p.#hd;rhKnty;/
Ky;iy epiyak;/ brd;id-17/ 2008.

Recommended Book

Dravida Mozhigalin Opaavuvu Oor Arimugam, DR. G. Johnsaamuvel,
Mullai nelayam, Chennai – 17, 2008.

<https://youtu.be/hlgWbMBYqOw>

<https://ta.m.wikipedia.org/wiki/%E0%AE%A4%E0%AE%BF%E0%AE%B0%E0%AE%BE%E0%AE%B5%E0%AE%BF%E0%AE%9F%E0%AE%AE%E0%AF%8A%E0%AE%B4%E0%AE%BF%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AF%81%E0%AE%9F%E0%AF%81%E0%AE%AE%E0%AF%8D%E0%AE%AA%E0%AE%AE%E0%AF%8D>

gad;fs; : Course Outcome

CO1	:	jpuhtpl bkhHpf; FLk;g xg;gha;tpd; tuyhw;wpid mwpjy;. Dravida mozhi Kudumba Oppaivin Varalarinai Arithal.
CO2	:	capbuhypfspd; ,iag[k; jphpg[k; bjhppe;J bfhs;sy;. Vuyirolegalin Eyaibum Tiribum Terintu Kollal.
CO3	:	bka;bahypfspd; ,iag[k; jphpg[k; fw;wvpjy;. Meyoligalin Eyaibum Tiribum Suttrarithal.
CO4	:	cUgd;/ bgah;r;brhw;fs;/ ntw;Wikfis mwpjy;. Vuruban, Peyarsorkal, Vettrumaikalai arithal.
CO5	:	jpuhtpl bkhHpfspd; bjhluikg;gpida[k; mjd; xw;Wik ntw;Wikfisa[k; mwpjy;.

		Dravida Mozhigalin Todarbinaiyum athan ottumai veatrumaigalaiyum arithal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	2
CO2	3	3	3	3	2
CO3	3	3	3	3	2
CO4	3	3	3	3	2
CO5	3	3	3	3	2
AVERAGE	3	3	3	2.8	2

**tpUg;gg; ghlk; - II : ,jHpay;
Viruppa Padam – II: Idhazhiyal**

Total Hours	:	Course Code	:
Credits	:	L.T.P.	:

nehf;fk; :

- 177.,jHpay; r_fj;jpw;F Mw;Wk; g';fpid czh;jy;.
- 178.,jHpayhshpd; r_fg; bghWg;g[k; g';fspg;g[k; czh;j;jy;.
- 179.,jHpaypd; eph;thf mikg;gp id mwpjy;.

Course Objectives :

- 178.Idhazhiyal samoogaththirku atrum panginai unarthal.
- 179.Idhazhiyalalarin samooga poruppum pangalippum unardhal.
- 180.Idhazhiyalin nirvaga amaippinai aridhal.

myF -1 :

,jHpay; tpsf;fk; - ,jH;fspd; gzpfs; - bghWg;g[fs; - ,jH;fspd; tiffs; - ,jHpayhshpd; jFjpfSk; jp wikfSk;.

Alagu – 1

Idhazhiyal Vilakkam – Idhazhgalin Panigal – Poruppugal – Idhazhgalin Vagaigal – Idhazhiyalalarin Thaguthigalum Thiramaigalum.

myF - 2:

bra;jpj;jhs; eph;thf mikg;g[- bra;jpahsh;/ bra;jpapd; cs;slf;'f';fspd; ngl;o - gy;ntW tifahd bra;jpfs;.

Alagu – 2

Seithiththal nirvaga amaippu – seithiyalar, seithiyin ulladakkangalin petti – palveru vagaiyana seithigal.

myF - 3:

Fw;wr;bra;jpfs; - bra;jp epWtd';fs; - gl';fSk;/ ,jH;fSk; - bra;jpfisr; brg;gzpLjy; El;g';fs;.

Alagu – 3

Kuttra Seithigal – Seithi Niruvanangal – Padangalum, Idhazhgalum – Seithigalai Seppaniduthal Nutpangal.

myF - 4:

bra;jp Mrphpah; - Jiz Mrphpah; - bra;jpapd; fl;likg;g[totikg;g[- mr;Rg;go jpUj;Jjy; - ,jHpay; fiyr;brhw;fs;.

Alagu – 4

Seithi Asiriyar - Thunai Aasiriyar – Seithiyin kattamaippu, vadivamaippu – achuppadi thiruththuthal – Idhazhiyal kalaisorkal.

myF - 5:

jiya';fk; - ,jH;fspy; tpsk;guk; - tpsk;gu tiffs;.

Alagu – 5

Thalaiyangam – Idhazhgalil vilambaram – Vilambara vagaigal.

ghpe;Jiu Ely;fs:

,jHpay; fiy - lhf;lh;. kh.gh.FUrhkp/ FU-njbkhHp/ jpUr;bre;J]h;/ 1988.

Recommended Book

Idhazhiyal Kalai, Prof. M.P. Guruswamy, Gurru-Themozhi, Thiruchendur, 1988.

ghh;it Ely;fs:

1. ,jHpay; Xh; mwpKfk; - M.ep.me;njhzpuhR
2. ,jHpay; tuyhW - lhf;lh;. kh.R.rk;ge;jd;
3. ,jHpay; - Kidth; ,uh.nfhjz;lghzp.

Reference Books

91.Idhazhiyal Orr Arimugam – A.N. Antonyrasu.

92.Idhazhiyal Varalaru – Prof. M.S. Sambandan.

93.Idhazhiyal – Prof. R.Kothandapani.

<http://www.noolulagam.com/tamil-book/16036/idhazhiyal-book-type-pothu/>

<http://www.tamildigitallibrary.in/book-detail.php?id=jZY9lup2kZl6TuXGlZQdjZt9lJxy&tag=#book1/>

gad;fs; : Course Outcome

CO1	:	,jHpay; jdppj;Jiwahf tsh;e;jjd; tuyhw;iw mwpKfg;gLj;Jjy;. Idhazhiyal thaniththuraiyaga varnthathan varalattrai arimugapaduththugal.
CO2	:	,jHpayhshpd; jFjpfisa[[k;/ jpwikfisa[k; bjhpe;J bfhs;sy;. Idhazhiyal thaguthigalaiyum, thiramaigalaiyum therinthu kollal.
CO3	:	bra;jpj;jhs; - bra;jpahsh; - bra;jp epWtd';fs; nghd;wtw;iw mwpjy;. Seithiththal – Seithiyalar – Seithi Niruvanangal pondravattrai arrithal.
CO4	:	,jHpay; Jiwapy; fhzyhFk; ntiy tha;g;gpw;fhd jFjpfis tsh;j;Jf; bfhs;sy;. Idhazhiyal thuraiyil kanalagum velai vaippirkana thaguthigalai valarthukollal.

CO5	:	tpsk;gu tiffis mwpe;J bfhs;sy;. Vilambara vaigaigalai arinthu kollal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	2.8	2.8	2.8

tpUg;gg; ghlk; - II : ,jHpay;
Viruppa Padam – II: Idhazhiyal

Total Hours :

Credits :

nehf;fk; :

Course Code :

L.T.P. :

- 180.,jHpay; r_fj;jpw;F Mw;Wk; g';fpid czh;jy;.
 181.,jHpayhshpd; r_fg; bghWg;g[k; g';fspg;g[k; czh;j;jy;.
 182.,jHpaypd; eph;thf mikg;gp id mwpjy;.

Course Objectives :

- 181.Idhazhiyal samoogaththirku atrum panginai unarthal.
 182.Idhazhiyalalarin samooga poruppum pangalippum unardhal.
 183.Idhazhiyalin nirvaga amaippinai aridhal.

myF -1 :

,jHpay; tpsf;fk; - ,jH;fspd; gzpfs; - bghWg;g[fs; - ,jH;fspd; tiffs; - ,jHpayhshpd; jFjpfSk; jpwikfSk;.

Alagu – 1

Idhazhiyal Vilakkam – Idhazhgalin Panigal – Poruppugal – Idhazhgalin Vagaigal – Idhazhiyalalarin Thaguthigalum Thiramaigalum.

myF - 2:

bra;jpj;jhs; eph;thf mikg;g[- bra;jpahsh;/ bra;jpapd; cs;slf;'f';fspd; ngl;o - gy;ntW tifahd bra;jpfs;.

Alagu – 2

Seithiththal nirvaga amaippu – seithiyalar, seithiyin ulladakkangalin petti – palveru vagaiyana seithigal.

myF - 3:

Fw;wr;bra;jpfs; - bra;jp epWtd';fs; - gl';fSk;/ ,jH;fSk; - bra;jpfisr; brg;gzpLjy; El;g';fs;.

Alagu – 3

Kuttra Seithigal – Seithi Niruvanangal – Padangalum, Idhazhgalum – Seithigalai Seppaniduthal Nutpangal.

myF - 4:

bra;jp Mrphpah; - Jiz Mrphpah; - bra;jpapd; fl;likg;g[totikg;g[- mr;Rg;go jpUj;Jjy; - ,jHpay; fiyr;brhw;fs;.

Alagu – 4

Seithi Asiriyar - Thunai Aasiriyar – Seithiyin kattamaippu, vadivamaippu – achuppadi thiruththuthal – Idhazhiyal kalaisorkal.

myF - 5:

jiya';fk; - ,jH;fspy; tpsk;guk; - tpsk;gu tiffs;.

Alagu – 5

Thalaiyangam – Idhazhgalil vilambaram – Vilambara vagaigal.

ghpe;Jiu E]y;fs;

,jHpay; fiy - lhf;lh;. kh.gh.FUrhkp/ FU-njbkhHp/ jpUr;bre;J]h;/ 1988.

Recommended Book

Idhazhiyal Kalai, Prof. M.P. Guruswamy, Gurru-Themozhi, Thiruchendur, 1988.

ghh;it Ely;fs;

4. ,jHpay; Xh; mwpKfk; - M.ep.me;njhzpuhR
5. ,jHpay; tuyhW - lhf;lh;. kh.R.rk;ge;jd;
6. ,jHpay; - Kidth; ,uh.nfhjz;lghzp.

Reference Books

- 94.Idhazhiyal Orr Arimugam – A.N. Antonyrasu.
- 95.Idhazhiyal Varalaru – Prof. M.S. Sambandan.
- 96.Idhazhiyal – Prof. R.Kothandapani.

<http://www.noolulagam.com/tamil-book/16036/idhazhiyal-book-type-pothu/>

<http://www.tamildigitallibrary.in/book-detail.php?id=jZY9lup2kZl6TuXGIZQdjZt9lJxy&tag=#book1/>

gad;fs; : Course Outcome

CO1	:	,jHpay; jdppj;Jiwahf tsh;e;jjd; tuyhw;iw mwpKfg;gLj;Jjy;. Idhazhiyal thaniththuraiyaga varnthathan varalattrai arimugapaduththugal.
CO2	:	,jHpayhshpd; jFjpfisa[[k;/ jpwikfisa[k; bjhpe;J bfhs;sy;. Idhazhiyal thaguthigalaiyum, thiramaigalaiyum therinthu kollal.
CO3	:	bra;jpj;jhs; - bra;jpahsh; - bra;jp epWtd';fs; nghd;wtw;iw mwpjy;. Seithiththal – Seithiyalar – Seithi Niruvanangal pondravattrai arrithal.
CO4	:	,jHpay; Jiwapy; fhzyhFk; ntiy tha;g;gpw;fhd jFjpfis tsh;j;Jf; bfhs;sy;. Idhazhiyal thuraiyil kanalagum velai vaippirkana thaguthigalai valarthukollal.
CO5	:	tpsk;gu tiffis mwpe;J bfhs;sy;. Vilambara vaigaigalai arinthu kollal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2

CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	2.8	2.8	2.8

**jhs; : 13 –,yf;fpak; - VI: r';f ,yf;fpa';fs;
Paper: 13: Ilakkiyam – VI : Sanga Ilakkiyangal**

nehf;fk; :

- 183.r';f fhy kf;fspd; mfk; kw;Wk; g[wthH;f;if epy';fis mwpar; bra;jy;.
184.r';f fhy kf;fspd; murpay;/ fiy/ gz;ghl;Lf; TWfs; r';fg; ghly;fspy;
,lk;bgWk; gh';fpid tpsf;fpf; TWjy;.
185.ghly;fspy; ,lk;bgWk; jpiz Jiwfs;/ ctikfs;/ ghf;fs; nghd;wtw;iw
,yf;fzf; TWfnshL bghUe;jpf; fhl;Ljy;.

Course Objectives :

- 184.Kaala Varalaatru Adipadaiyil Ilakiyangalai Nokkumpothu Thrkaala
Ilaikiyangalin Vakaiyum Utporulum Kurithu Ariya Vaiythal.
185.Ikkala Ilaikkya Vaimaigalumkkum Eaduthukkattaga Ulla Sela
Badaippukalai Vilakuthal.
186.Manavargal Thangaludaya Badaippu Tharanai Valarthuk Kola
Ikkala Ilakkiya Vagaimaigal Uthavuthal.

myF -1 :

- **FWe;bjhif : Fwp";rpj; jpizg; ghly;fs;**
1. kh vd kIYk; Ch;t/ g{ vd (ghly; vz;. 17)
2. mUk;g[fmw kyh;e;j fU';fhy; nt';if (ghly; vz;. 26)
3. fhiya[k; gfYk; ifaW khiya[k; (ghly; vz;. 32)
4. fhd k";i" miw<d; Kl;il (ghly; vz;. 38)
5. ahnd <z;il nans/ vd; eynd (ghly; vz;. 54)
6. vw;nw thHp! njhHp Kw;Wg[(ghly; vz;. 90)
7. bgWtJ ,iaahJ MapDk; cWtJ xd;W (ghly; vz;. 199)
8. jiyg;gpizf; bfhsnd/ jiyg;g[izf; bfhs;Sk; (ghly; vz;. 222)
9. Ftis ehWk; Fit ,Uk; Te;jy; (ghly; vz;. 300)
10. epyk;g[il bgahpDk; ePh;jPg; gpwHpDk; (ghly; vz;. 373).
- **ew;wpid**
1. rpWbts;s'; FUnf rpWbts;sh'; FUnf (ghly; vz;. 70)
2. kd;w mUik kyh;jiyf; fhuhz; (ghly; vz;. 80)
3. mhpffhy; khwpa mk;fz; mfy; tpay; (ghly; vz;. 210)
4. JspjPh; Tl;lbkhL Js;shh; MapDk; (ghly; vz;. 216)
5. g[y;nyd; kfpH;e g[yj;jYk; ,y;nyz; (ghly; vz;. 340)
- **I';FWE]W : bea;jy; jpizg; ghly;fs;**
1. jha;f;Fiuj;j gj;J (ghly; vz;. 101-110)
2. tisg;gj;J (ghly; vz;. 191-200)

Alagu -1 :

- **Kurunthogai: Kurinji Thinai**

1. Ma ena madalum oorva, poo ena (Padal No. 17).
2. Arumbuga Aramalarantha karungal vengai (Padal No. 26)
3. Kalaiyum Pagalum Kaiyaru malaiyum (Padal No. 32)
4. Kana Manjai araisan muttai (Padal No. 38)
5. Yanne Endaiyale, enn nalanne (Padal No. 54)
6. Etre vaazhi! Thozhi Mutru (Padal No. 90)
7. Peruvathu Iyaiyathu Ayinum Uruvathu onru (Padal No. 199)
8. Thalaipinaik koline, thalaippunai kollum (Padal No. 222)
9. Kuvalai naarum Kuvai irum Koonthal (Padal No. 300).
10. Nilampudai peyarinum Neertheep pirazhinum (Padal No. 373).

➤ **Nattrinai**

1. Siruvellan Kuruge Siruvellang Kuruge (Padal No. 70)
2. Mandra Arumai malarthalai karaan (Padal No. 80)
3. Arigal mariya Amkan Agal viyal (Padal No. 210)
4. Thulitheer kootamodu thullar aayinum (padal No.216)
5. Pullen magizhna pulathalum illen (Padal No.340)

➤ **lingurunooru : Neidal Thinai Padalgal**

1. Thaikkuraitha paththu (Padal No. 101-110)
2. Valaipaththu (Padal No. 191-200).

myF - 2:

➤ **mfehD]W ; Ky;iyj; jpizg; ghly;fs;**

1. tpUe;jpd; kd;dh; mU';fyk; bjWg;g (ghly; vz;. 54)
2. tUJk; vd;w ehSk; bgha;j;jd (ghly; vz;. 144)
3. ky;Fy; khkiH tpz; mjph;g[KH';fp (ghly; vz;. 294)
4. ,Ue;j nte;jd; mUe;bjhHpy; Koj;bjd (ghly; vz;. 384)
5. fst[k; g[spj;jd/ tpdt[k; gGepd (ghly; vz;. 394).

➤ **fypj;bjhif: ghiyj; jpizg; ghly;fs;;**

1. mhpkh; ,oj;jd;d; mk;rpiy ty;tpy; (ghly; vz;. 15)
2. ,y';Fxsp kUg;gpd; ifk;kh csk;g[eh; (ghly; vz;. 23)
3. taf;FW kz;oyk; tlbkHpg; bgah;bgw;w (ghly; vz;. 25)
4. mUe;jtk; Mw;wpahh; EfH;r;rp;ng;hy;/ mzpbfhs (ghly; vz;. 30)
5. fLk;g[dy; fhy;gl;Lf; fYH;njwpf; ftpd;bgw (ghly; vz;. 31)

➤ **ghpghly;**

1. jpUkhy; - jPapDs; bjwy; eP g{tpDs; ehw;wk; eP (ghly; vz;. 63-72)
2. brt;nts; - Fwg;gpzhf; bfhoiaf; Tonaha; thH;j;J
3. kJiu - khnahd; bfhg;g{H; kyh;e;j jhkiu (ghly; vz;. 1-11).

Alagu - 2:

➤ **Agananooru Mullai Thinai Padalgal**

1. Virundhin Mannar Arungalam Theruppa (Padal No.54)
2. Varudhum Endra Naalum Poiththana (Padal No.144)
3. Malgul Maamazhai Vin Adhirbu Muzhangi (Padal No.294)

4. Irundha Vendhan Arundhozhil Mudithena (Padal No.384)
5. Kalavum Pulithana, Vinavum Pazhunina (Padal No.394)

➤ **Kaliththogai : Palai Thina Padalgal**

1. Airman Idithanna: Amsilai Valvil (Padal No.15)
2. Ilangu Oli Marupin Kaimma Ulambunar (Padal No.23)
3. Vayakkuru Mandilam Vadamozi Peyarpetra (Padal No.25)
4. Arundhavam Aatriyar Nugarchi Pole, Anikola (Padal No.30)
5. Kadumpunal Kaalpattu Kalumtheri Kavinpera (Padal No.31)

➤ **Paripadal**

1. Thirumaal- Theeyunul Theral Nee Poovinul Naatram Nee (Padal No.63-72)
2. Sevvil - Kurappinaak Kodiyai Koodiyoi Vazhthu.
3. Madhurai - Maayon Koppoozh Malarndha Thaamarai (Padal No. 1-11)

myF - 3

➤ **g[wehD]W**

1. tpiskhl;rpa tpiug[utpnahL (ghly; vz;. 16)
2. ePh; kpfpd; rpiwa[k; ,y;iy/ eP kpfpd; (ghly; vz;. 51)
3. vG,dp/ be";rk;/ bry;fk;/ ahnuh (ghly; vz;. 207)
4. Fd;Wk; kiy gy;gpd; xHpa (ghly; vz;. 208)
5. gyh;f;F epH yhfp cyfk; kpf; Twp (ghly; vz;. 223)
6. ePL thH;f vd;W ahd;/ beL';fil FWfp (ghly; vz;. 237)
7. beLePu epiwfaj;Jg; gLkhwpj; Jspnghy (ghly; vz;. 286)
8. fhdf; fhf;iff; fypr;rpwF Va;f;Fk; (ghly; vz;. 342)
9. Ejpnty; bfhz;L Ejy; tpah;Jilah (ghly; vz;. 349)
10. bjd; gujth; kply;rha (ghly; vz;. 378)

➤ **gjpw;Wg;gj;J**

1. cyfk; g[uf;Fk; cUbfG rpwg;gpd; (ghly; vz;. 81)
2. vLj;njW Va fog;g[il mjpUk; (ghly; vz;. 84)
3. ey;kuk; Jtd;wpa ehLgy jhP, (ghly; vz;. 85)
4. itafk; kyh;e;j bjhHpy;Kiw xHpahJ (ghly; vz;. 88)
5. typbfG jlf;if (ghly; vz;. 90)

Alagu – 3:

➤ **Purananooru**

1. Vilaimatchiya Viraipuraviyodu (Padal No. 16)
2. Neer Migin Siraiyum Illai , Nee Migin (Padal No. 51)
3. Ezhu Ini , Nenjam , Selgam , Yaaro (Padal No. 207)
4. Kundrum Malai Palpin Ozhiya (Padal No.208)
5. Palarkku Nizha Lagi Ulagam Mik Koori (Padal No.223)
6. Needu vazhga endru yaan , nedungadai kurugi (Padal No. 237)
7. Neduneera Niraigayathu Padumaari Thulipola(Padal No.286)
8. Kaana Kaakkai Kalichiragu Yeykum (Padal No.342)

9. Nudhivel Kondu Nudhal Viyar Thudaiyaa(Padal No.349)
- 10.Then Paadhavar Midalsaaya (Padal No.378)

➤ **Pathittrupaththu**

1. Ulagam Purakkam Urugezhu Sirappin (Padal No.81)
2. Edutheru Yeya Kadipudai Adhirum (Padal No.84)
3. Nalmaram Thuvandriya Naadupala Tharii(Padal No.85)
4. Vaiyagam Malarndha Thozhilmurai Ozhiyadhu (Padal No.88)
5. Valikezhu Thadakkai (Padal No.90)

myF - 4:

Fwp";rpg; ghl;L KGika[k; (1 Kjy; 261 mofs; tiu)

Alagu – 4

Kurinjipattu Muzhumaiyum (1 mudhal 261 adigal varai)

myF - 5

kJiuf; fh";rp (327 Kjy; 699 mofs; tiu)

Alagu – 5

Maduraikanchi (327 mudhal 699 adigal varai)

ghpe;Jiu E]y;fs;

1. r';f ,yf;fpak;/ Kidth;. r.nt.Rg;gpukzpad; (gjpg;ghrphpah;) kzpthrfh; E]yfk;/ brd;id/ 108/ 2006.
2. r';f ,yf;fpak;/ fHf ciu/ irt rpj;jhe;j E]w;gjpg;g[f; fHfk;/ brd;id-18.

Recommended Book

1. Sanga Ilakkiyam, Prof. S.V. Subramaniyan (Pathipasiriyar) Manivasagar Nooolagam, Chennai-108, 2006.
2. Sanga Ilakkiyam, Kazhaga Urai, Saiva Siddhantha Noorpathippukazhagam, Chennai-18.

ghh;it E]y;fs;

25. bjhy;fhg;gpak;-bghUsjpfhuk;/ bjhy;fhg;gpah;-jpUbey;ntyp-bjd;dpe;jpa irt rpj;jhe;j E]w;gjpg;g[f; fHfk;- brd;id-18.
26. jkpHh; ehfhpfKk; gz;ghLk;/ Kidth;. M.jl;rpzh_h;j;jp/ le;jpizg; gjpg;gfk;/ nkW;F mz;zhefh;/ brd;id-40.
27. jkpHf tuyhW kf;fSk; gz;ghLk;/ lhf;lh;. nf.nf.gps;is/ cyfj; jkpHuha;r;rp epWtd btspaPL.
28. g[wg;bghUs; btz;ghkhiy/ Kidth; r."hdrk;;ge;jk; ciu/ fjph; gjpg;gfk;/ jpUitahW-613204.
29. ghl;Lk; bjhifa[k;/ bjhy;fhg;gpaUk; jkpH;r; r_f cUthf;fKk;/ uh#;bfsjkd;

Reference Books

- 97.Tholkaapiyam- Poruladhigaram, Tholkaapiyar-Thirunelveli-Thennindhiya Saivasidhartha Noorpadhippu Kazhagam- Chennai-18.

98. Tamizhar naagarigamum panpaadum, munavar aa.dhatchina moorthi, aindhinai Pathippagam, West Annanagar, Chennai-40.
99. Tamizhaga varalaru Makkalum, Panpadum, Prof. K.K.Pillai, Ulaga Thamizharaichii Niruvana Veliyeedu.
100. Purapporul Venbamalai, Prof. S. Gnanasambandam Urai, Kathir Pathippagam, Thiruvaiyaru – 613204.
101. Pattum Thogaiyum Tholkappiyarum, Tamizh Samooga Uruvakkamum, Raj Gowthaman.

<https://www.youtube.com/watch?v=HgejwenObf0&feature=youtu.be>

<https://www.youtube.com/watch?v=L4UBnjUgdEU>

<https://www.youtube.com/watch?v=V953qGvBTwo>

<https://www.youtube.com/watch?v=clvuSNrCnec>

gad;fs; : Course Outcome

CO1	:	r';f fhy ghly;fspy; fhzyhFk; jpiz Jiwfs; ctikfis mwpjy;; Sanga kala padalgalil kanalagam thinai thuraigal uvamaigalai arithal.
CO2	:	r';f fhy kf;fspd; mftthH;;f;iff; TWfis tps';fpf; bfhs;Sjy;. Sanga kala makkalin agavazhkkai koorugalai vilangikolluthal.
CO3	:	r';f fhy kf;fspd; g[wthH;tpay; TWfisr; r';fg; ghly;fspy; bghUj;jp mwpjy;. Sanga kala makkalin puravazhviyal koorugalai sanga padalgalil poruththi aridhal.
CO4	:	r';f fhy kf;fs; nghw;wpa ,aw;ifnahL xd;wpa thH;tpid mwpe;J nghw;Wjy;. Sanga kala makkal potriya iyarkaiyodu ondriya vazhvinai arinthu pottruthal.
CO5	:	r';f fhyj;J kf;fspd; murpay;/ fiy/ gz;ghl;Lf; TWfiis kJiuf; fh";rp tHp xg;gpIl;L Ma;jy;. Sanga kalaththu makkalin arasiyal, kalai, panpattukoorugalai Maduaikanchi vazhi oppittu aidhal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3

CO3	3	3	3	3	3
CO4	2	2	2	3	3
CO5	3	3	3	3	3
AVERAGE	2.8	2.8	2.8	3	3

,uz;lhk; - Rw;Wr; NHy; fy;tp
Second Semester - Suttrusoozhal Kalvi

Total Hours : **Course Code** :
Credits : **L.T.P.** :

nehf;fk; :

- 186. thGk; kdpjd; nkw;bfhs;Sk; r_fr; rpf;fy;fis czh;j;Jjy;.
- 187.kf;fs; bgUf;fKk;/ mjdhy; Vw;gLk; bjhw;Wneha;fisa[k; tpsf;Fjy;.
- 188.Rw;Wr;NHy; khRghL mila fhuzk; vd;dbtd;gij tpsf;Fjy;.

Course Objectives :

- 187.Vazhum manithan merkollum samooga sikkalgalgalai unarththuthal.
- 188.Makkal perukkamum, adhanal erpadum thotrunoigalaiyum vilakkuthal.
- 189.Sutruchoozhal masubadu adaiya karanam ennavenbathai vilakkuthal.

myF : 6

- r_fr; rpf;fy;fSk; Rw;Wr; NHYk;
 - ♦ epiyj;jpUf;ff; Toa tsh;r;rp
 - ♦ efh;g;g[wg; gpur;ridfs;
 - ♦ kiHePh; nrfhpg;g[
 - ♦ ePh;g;gphpKfL nkyhz;ik
 - ♦ thdpiy khw;w';fs;
 - ♦ mkpy kiH
 - ♦ kf;fs; EfH;t[g; gHf;f';fSk; fHpt[fSk;
 - ♦ Rw;Wr; NHy; ghJfhg;g[r; rl;l; - 1986
 - ♦ fhw;W khRghL jLg;g[r; rl;l; - 1981
 - ♦ jz;zPh; khRghL jLg;g[r; rl;l; - 1976
 - ♦ td caphpdg; ghJfhg;g[r; rl;l; - 1972
 - ♦ Rw;Wr;NHY; tpHpg;g[zh;t[
 - ♦ bra;Kiwg; gapw;rp

Alagu : 6

- Samooga sikkalgalum sutruchoozhalum
 - ♦ Nilaitthirukka koodiya valarchi
 - ♦ Nagarpura prachanaigal
 - ♦ Mazhaineer segarippu
 - ♦ Neerpirimugadu melanmai
 - ♦ Vaanilai matrangal
 - ♦ Amila mazhai
 - ♦ Makkal nugarvu pazhakkangalum kazhivugalum
 - ♦ Sutruchoozhal pathukappu sattam – 1986.
 - ♦ Katrumasubadu thaduppu sattam - 1981
 - ♦ Thaneer Masupadu thaduppu sattam – 1976.
 - ♦ Vana uyirina pathukappu sattam – 1972.
 - ♦ Sutruchoozhal vizhipunarvu
 - ♦ Seimurai payirchi

myF : 7

- kf;fs; bgUf;fKk; Rw;Wr; NHYk;
 - ♦ kf;fs; bjhifg; bgUf;fj;jpy; ehLfspilna epyt[k; ntWghLfs;
 - ♦ kf;fs; bjhifg; bgUf;fj;jpw;Ff; fl;Lg;ghL - FLk;gf; fl;Lg;ghL
 - ♦ Rw;Wr;NHYk; kf;fs; ey;thH;t[k;
 - ♦ Rw;Wr;NHY; fy;tpa[k; kdpj ew;gz;g[Cf;fKk;
 - ♦ bAr;.l.tp. / va;l;!; kw;Wk; Rw;Wr;NHY;
 - ♦ bgz; kw;Wk; FHe;ijfs; eyDk; Rw;Wr;NHYk;
 - ♦ Rw;Wr;NHY; ghJfhg;g[kw;Wk; eythH;tpy; jfty; bjhHpy;El;gj;jpd; g';F
 - ♦ bra;Kiwg; gapw;rp

Alagu : 7

- Makkal perukkamum sutruchoozhalum
 - ♦ Makkal thogai perukkaththil nadugalidaiye nilavum verupadugal.
 - ♦ Makkal thogai perukkaththirku kattupadu-Kudumba kattupadu.
 - ♦ Suutruchoozhalum makkal nalvazhvum.
 - ♦ Sutruchoozhal kalvium manitha narpanbu ookkamum.
 - ♦ HIV / AIDS matttrum sutruchoozhal.
 - ♦ Pen matttrum kuzhanthaigal nalanum sutruchoozhalum.
 - ♦ Seimurai payirchi.

myF : 8

- MW/ fhL/ g[y;btspfs;/ kiy/ kiyj;bjhlh;fs; nghd;w NHy; bry;t';fis khzth;fs; ghh;itapl;L Xh; mwpf;if jhf;fy; bra;jy;
- Efuk;/ fpuhk';fs;/ bjhHpyf';fs;/ tptrhak; nghd;wit vt;thW khRghL mile;Js;sd vd;gijf; fz;lwpe;J mwpf;if jhf;fy; bra;jy;
- rhjhuzkha; fhzg;gLk; jhtu';fs;/ g{r;rpfs;/ gwitfs; gw;wp mwpjy;
- vspa NH;epiy kz;ly';fis Muha;jy;
- jkpHfj;jpy; fhzg;gLk; tpy';Fr; ruzhaya';fis / njrpag; g{'f;fhf;fisg; ghh;itapl;L mt;tpy';Ffs; gwitfs; Mfpatw;wpd; bray;ghLfis mwpf;ifaha; mspj;jy;.

Alagu : 8

- Aaru, Kaadu, Pulveligal, Malai, Malaithodargal Pondra Soozhal Selvangalai Maanavargal Paarvaiyitu Oor Arikkai Thakkal Seydhal.
- Nugaram, Gramangal, Thozhilagangal, Vivasayam Pondravai Evvaru Maasupadu Adaindhullana Enbadhai Kandarindhu Arikkai Thakkal Seydhal.
- Saadharanamay Kanappadum Thavarangal, Poochigal, Paravaigal Patri Aridhal.
- Eliya Soozhnilai Mandalangalai Aaraydhal.
- Tamizhagathil Kaanapadum Vilangu Saranaalayangalai / Dhesiya Poongaakalai Paarvaiyitu Avvilangugal Paravaigal Aagiyavattrin Seyalpaadugalai Arikkaiyay Alithal.

ghpe;Jiu E]y;

Rw;Wr;NHy; fy;tp

Recommended Book

Suttrusoozhal Kalvi

gad;fs; : Course Outcome

CO1	:	ePh; khRghL/ kiHappd; Fiwt[,tw;iw vLj;Jf; Twp ,ij vt;thW rhp bra;tJ vd;W khztpfSf;F mwppt[Wj;jp bray;gl itj;jy;. Neer masupadu, mazhaiyin kuraivu ivattrai eduthu koori ithai evvarru sari seivathu endru managivalukku arivuruthi seyalpada vaiththal.
CO2	:	kf;fs; bgUf;j;jpw;fhd jPh;t[- cly; Mnuhf;fpakhd epiy-ew;gz;g[fs; ,tw;iw vLj;Jf;Twp vjph;fhy rKjhaj;iij neh;tHpgLj;j Kaw;rpj;jy;.

		Makkal perukkaththirkana theervu – Udal arokkiyamana nilai – narpanbugal ivatrai eduthukoori ethirkala samudhayaththai nervazhi paduththa muyarchiththal.
CO3	:	tpy';Ffs; kw;Wk; gwitfs; thH; fhLfis mjpfhpf;f bra;jy; Fwpj;j tpHpg;g[zh;t]. Vilangugal matttrum paravaigal vazh kadugalai athigarikka seithal kuriththa vizhipunarvu.
CO4	:	Fiwthd ePiu gad;gLj;j ntz;Lk; - mwpjy;. Kuraivana neerai payanpaduththa vendum – Arithal.
CO5	:	ehL JJa;ika[w xt;bthU ehl;od; gpuipeppjpa[k; bray;gl ntz;Lk; vd tpa[Wj;jy;. Naadu thoymaiyura ovvoru naatin pradhi nidhiyum seyalpada vendum ena valiyuruthal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	1
CO2	3	2	2	2	2
CO3	2	3	3	2	2
CO4	3	2	3	2	2
CO5	3	3	3	3	3
AVERAGE	2.8	2.6	2.6	2.2	2

**jkpHh; kUj;Jtk; md;Wk; ,d;Wk;
Thamizhar Maruthuvam Andrum Indrum**

Total Hours	:		:	Course Code
Credits	:		:	L.T.P.

nehf;fk; :

- 189.gy;ntW rpwg;g[g; ghl';fis gapYk; khztpah;f;F rpwg;g[g; ghlk; rhuwj (NME) xU ghlkhf jkpHh; kUj;Jtk; md;Wk; ,d;Wk; kUj;Jtk; Fwpj;j bra;jpfis tH';FfpwJ.
- 190.rpj;j kUj;Jtk;/ Ma[s; ntjk; nghd;wtw;iw bjhpag;gLj;Jjy;/ jt xGf;fj;jpYk; Md;k neaj;jpYk; rhpahf ,Ue;j jd;te;jphp/ gj";ryp Mfpnahhpd; kUj;Jtf; Fwpg;g[fis Muha;jy;.
- 191.jkpH; kUj;JtKk;/ M';fpy kUj;JtKk; vt;tifapy; gadspf;fpwJ vd;gij mwpjy;.

Course Objectives :

190. Palveru Sirappu Padangalai Payilum Manaviyarkku Sirappu Padam Saradha (NME) Oru Padamaga Thamizhar Maruththuvam Andrum Indrum Maruththuvam Kuriththa Seithigalai Vazhangugirathu.

191. Sittha maruththuvam, Ayiul vedham pondaravatrai theriyappaduthuthal, thava ozhukkathilum anma neyaththilum sariyaga iruntha thanvanthari, pathanjali agiyorin maruththuva kurippugalai aaraithal.

192. Thamizh maruththuvamum Angila maruththuvamum evvagaiyil payanalikkirathu enbathai arithal.

myF 1 :

,e;jpakUj;JttuyhW - jd;te;jphp - #PtfLkhugr;rd; - Mj;jpnuah; - rufh; - thf;gl;lh; - jkpHfj;jpy; Ma[s;ntjk; - rpj;jh; kug[.

Alagu – 1

Indhiyamaruthuva varalaru – thanvandhiri – jeevagadumaarabachan – Aathireyar – Saragar – Vaakpattar – Thamizhagathil aayulvedham – Sithar maraapu.

myF 2 :

jkpHpy; kUj;Jt E]y;fs; - mfj;jpah; - njiuah; - brfuhnrnfuk; - guuhnrnfuk; - jkpHh; kUj;Jtj;jpd; jdpr;rpwg;g[fs; - czntkUe;J.

Alagu – 2

Thamizhagathil maruthuva noolgal – Agathiyar – Deraiyer – Segarasasegaram – pararaasasegaram – Tamizhar maruthuvathin thanisiraapugal – vunave marundhu.

myF 3 :

tPl;Litj;jpak; - brkpahf; FzKk; tha;t[k; - kyr;rp;fy; - _ytpahjp - tapnwhl;lk; - Flw;g[Gf;fs; - tapw;Wg;g[z; - the;jp - ePhpHpt[- ryf;fLg;g[- rpWePuff; fw;fs; - jLky; - ,Uky; - fha;r;ry; - jiytyp - bgUk;ghL - myh;#p - glh;jhkiu - vUfhak; - Kfg;gU - gy;typ.

Alagu – 3

Veetuvaitthiyam – Semiyakku kunamum vaaivum – Malachikkal – Mulaviyathi – Vayirottam – Kudarpulukkal – vayitruppun – Vaandhi – Neerizhavu – Salakkaduppu – Siruneeraga karkal – Thadumal – Irumal – Kaaichal – Thalaivali – Perumpaadu – Allergy – Padarthamarai – Erukaayam – Mugapparu – Palvali..

ghpe;Jiu E]y;

jkpHh; kUj;Jtk; md;Wk; ,d;Wk; - fyhepjppghyrptflhl;rk;/ kzipnkfiyg; gpuRuk;/ jzpfhryk; rhiy/ brd;id-17/ Kjw;gjpg;g[/ 2009.

Recommended Book

Thamizhar maruthuvam andrum indrum – Kalaanithibalasivakadaacham , Manimegalai pirasuram , Dhanikachalam saalai , Chennai – 17 , Mudharpathippu , 2009.

gad;fs; : Course Outcome

CO1	:	Ma[s; ntjk; njhd;wpa tuyhWk; mjd; rpwg;g[fisa[k; mwpe;J bfhs;Sjy;. Aayul vedham thondriya varalarum adhan sirappugalaiyum arindhu kolludhal
CO2	:	gHikahd jkpH;E]y;fspy; cs;s kUj;Jt Kiwiaa[k;/ Ma[h;ntj fl;Lg;ghL ,tw;wpd; mtrpaj;ij bjhppe;Jf; bfhs;s;sjy;. Palamaiyaana thamizh noolgalil ulla maruthuva muraiyaiyum , ayurvedha kattupadu ivatrin avasiyathai therindhuk kolludhal.
CO3	:	eho nrhjld/ tp\Kwpt[/ cztf; fl;Lg;ghL ,tw;wpd; mtrpaj;ij bjhppe;Jf; bfhs;Sjy;. Naadi sodhanai, Vishamurivu, vunavuu kattupaadu ivatrin avasiyathai therindhu kolludhal.
CO4	:	,ja neha;fs; kw;Wk; ,uj;j mGj;jk; Fwpj;jr; bra;jpfis tps';fpf; bfhs;Sjy;. Idhaya noigal mattrum iratha allutham kurithu seithigalai vilangi kolludhal.
CO5	:	rpWePufj;jpy; Vw;gLk; gpur;ridfisa[k;/ gy;ntW ijiytypfs;/ gw;fs; ghJfhg;g[kw;Wk; bgUk;ghL Fwpj;jr; bra;jpfisa[k; mwpjy;. Seeruneeragathil Erpadum Pirachanaikalaiyum, Palverru Thailaivaligal , Parkal Paadhukaapu Matrum Perumpaadu Kurithu Seithigakalaiyum Aridhal.

MAPPING : COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME					
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	2
CO2	3	2	3	3	3
CO3	2	2	3	3	2
CO4	3	3	2	2	3
CO5	2	3	2	2	3
AVERAGE	2.6	2.4	2.6	2.6	2.6

**QUAID-E-MILLATH GOVERNMENT COLLEGE FOR
WOMEN (AUTONOMOUS), CHENNAI – 02**

PG & RESEARCH DEPARTMENT OF ECONOMICS

SYLLABUS -M.Phil



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

OFFERED FROM THE ACADEMIC YEAR 2017-18

CONTENTS

Rules and regulations for the Programme

Programme Outcomes

Programme Specific Outcomes

Programme Profile

PROGRAMME SPECIFIC OUTCOME (PSO)

- 1. Enables to comprehend the issues of the economy at the regional, national and international perspectives**
- 2. Understands the format of a research report and implications of the preceding research**
- 3. Promotes investigative skills to identify research areas and pursue systematic analysis**

4. Identify the suitable economic policies for the chosen research area and analyse its implications
5. Encourage to pursue further research in pursuit of specialisation in their respective field

QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMEN

(AUTONOMOUS)

ANNA SALAI, CHENNAI 600002

M.PHIL., ECONOMICS

1. Eligibility

A Candidate who has qualified for the Master's Degree in Economics of University of Madras or any other university recognized by the university of Madras as equivalent there to (including old regulations of any university) subject to such conditions as may be prescribed therefore shall be eligible to register for the Degree of Master of Philosophy (M.Phil) and undergo the prescribed course of study in a Department concerned.

A candidate who has qualified in Master degree with not less than 55% of marks in the concerned subject shall be eligible to register for M.Phil course. SC/ST candidates are exempted by 5% from the prescribed minimum marks.

2. Duration

The duration of the M.Phil course shall be one year consisting of two semester for the full-time programme.

3. Course of Study

The course of study shall consist of

Part-I: 3 Written papers and

Part-II: Dissertation.

The three papers under Part-I shall be:

Paper-I : Introduction to Research Methods in Economics

Paper-II : Economic Theory

Paper-III :Contemporary Economic Issues in India

Paper I, II &III shall consist of 5 units covering the subject requirements of the course offered. The syllabi for Paper I, II & III has been approved by the board of studies. Paper-I, II& III shall be set externally and valued by two examiners, one Internal and one External. The concerned HOD will be the chairman of the Board of Examiners to pass the results.

4. Scheme of Examination

4.1 PART-I

Paper-I: Introduction to Research Methods in Economics
Paper -II: Economic Theory
Paper -III: Contemporary Economic Issues in India

4.2 Written Examination

The examination for Papers I, II & III shall be taken at the end of March of every year. Each paper shall have 100 marks for the examination (written). The duration for each examination shall be 3 hrs. A candidate shall be declared to have passed part-I examination if he secures not less than 50% of marks.

4.3 Part –I Credits

Paper	Name of the paper	Contact Hours	Library Hours	Total Hours	Credits
I	Introduction to Research Methods in Economics	6	4	10	6
II	Economic Theory	6	4	10	6

III	Contemporary Economic Issues in India	6	4	10	6
	Total			30	18

4.4 Part-II

4.4.1 Dissertation

For carrying out the dissertation the mandatory requirements is a pass in paper-III. Every student is expected to give two seminars one concerning the Review of Literature just within three weeks from the beginning of the second semester and other on date analysis just before the submission of the final draft of the dissertation. Candidates shall submit the dissertation to the Controller of Examination at the end of fifth month after the theory examination. The above said time limit shall start from 1st of the month which follows after the month in which Part –I examinations are conducted. If a candidate is not able to submit his dissertation within the period stated above, he shall be given an extension of one month time with penalty. One external examiner and the Research Guide /Supervisor shall value the dissertation. The external examiner should be from University within TamilNadu.

Part-II Credits

Paper	Evaluation	Marks	Credits
IV	Dissertation Evaluation	100	18

5. QUESTION PAPER PATTERN

The students should answer 5 out of 8 questions and each question will carry 20 marks.

6. CLASSIFICATION OF SUCCESSFUL CANDIDATES

The candidates who passed the Part-I and Part-II examination in their first attempt shall be classified as follows.

1.50% to 74%

2.75% and above Highly commended

7. QUALIFICATIONS OF GUIDES FOR THE M.Phil COURSE

A person eligible to be a guide shall be required to possess a Ph.D degree or two years of post graduate teaching experience after qualifying for M.Phil degree. He/She should have obtained recognition from the University. Change of guide may be permitted as per University norms.

8. ATTENDANCE

Daily attendance for 90 working days should be enforced for the students. Periodical report of a student to the guide concerned should be recorded in the register kept by the guide. The broad area for the dissertation may be finalized at the beginning of the M.Philprogramme, so that the

collection of relevant literature and research design could be completed in the first semester leaving the entire for the research work.

9. COURSE STRUCTURE

Paper Code	Title of the Paper	Contact Hours	Marks	Credits
PART-I				
Paper-I	Introduction to Research Methods in Economics	10	100	6
Paper-II	Economic Theory	10	100	6
Paper-III	Contemporary Economic Issues in India	10	100	6
PART-II				
Paper- IV	Dissertation	-	100	18
Total			400	36

M.Phil., ECONOMICS - FRAMEWORK				
SEM	MAJOR / ELECTIVE	CODE	TITLE OF THE PAPER	CREDITS
I	MAJOR I	171401	Introduction to Research Methods in Economics	6
	MAJOR II	171402	Economic Theory	6
	ELECTIVE	171403	Contemporary Economic Issues in India	6
Total Credits for Semester I				18
II	MAJOR III		Dissertation	6
Total Credits for Semester Ii				6
Course Credits Grand Total				24

PAPER I

INTRODUCTION TO RESEARCH METHODS IN ECONOMICS

TOTAL HOURS: 90

COURSE CODE: 171401

CREDITS: 6

L-T-P:

COURSE OBJECTIVES:

1. To illustrate the evolution of institutional aspects of economic science
2. To acquire knowledge about methods of data collection
3. To gain knowledge about the research design and the components of research report
4. To learn the quantitative techniques and apply in the research analysis
5. To learn analytical skills to compute research issues

COURSE OUTLINE:

Unit I : Evaluation of methods of study in Economic Science –Early methods of economics-Philosophical –Historical –Political –The introduction of methods of physical science and mathematical –Philosophy of Science –Economic nationalism and institutional aspects of economic science

(15 Hours)

Unit II: Research in Modern economics –Facts and Theory and their inter –action – positive and welfare economics-The place of theory and hypothesis –Survey –

Questionnaire –Case Study –Interview –Field Vision and other methods –data collection
Analysis-Representative –preparation of research report-Bibliography and references –
economic writings in modern economics

(15 Hours)

Unit III: Logic and scientific methods –definition-Classification –deductive and inductive
methods –Syllogism –Proposition –fallacies in economics –truth –truth tables –important
methods of modern logic

(20 Hours)

Unit IV: Mathematical tools of economic analysis –Limits and continuity of functions –
derivatives –derivation of power log, Exponential Functions with application, Partial
derivatives and applications –conditions for maximum and minimum (restricted to two
variables)

(20 Hours)

Unit V : Statistical tools of economic analysis – Sampling techniques –Random –Stratified
Random and cluster sampling –determinants of Sample size –National sample surveys –
Analysis of cross section data –Measure of Variance (One Way) –partial correlation
coefficient and its interpretation –formulation and testing of statistical hypothesis –Chi
square applied to contingency table –T test for the population mean and regression co
efficient –Sources of Indiandata

(20 Hours)

RECOMMENDED BOOKS:

1. Mathematical Analysis –J.E.Weber
2. Mathematical Analysis for Economics –R.G.D .Allen

REFERENCE BOOKS:

1. Research methods in Economics –R.Ferber and P.J.Verdon
2. Statistics –T. Yamane
3. Methodology of research in Social Science –V. Shanmugasundaram
4. Guide to research in Economics- C.T. Kurien
5. An introduction to deductive logic –HugesLablane

JOURNALS:

1. International Journal of Social Research Methodology
2. Journal of Mixed Methods Research: SAGE Journals

E-LEARNING RESORCES

1. <https://www.qualtrics.com> › blog › research-problem
2. <https://research-methodology.net> › research-methods › data-collection
3. <https://planningtank.com> › computer-applications › data-processing
4. <https://socialresearchmethods.net> › hypothes
5. www.studylecturenates.com › social-research-methodology › types-of-research

COURSE OUTCOME:

1. Gain knowledge about criteria of selecting research problem
2. Understand the methods of collecting data according to the research requirements
3. Acquaint knowledge about the methods of data processing and represent them in presentable form with the help of computers
4. Learn the significance of hypothesis, its characteristics and methodology of testing it
5. Enables to understand the format of a research report and its essentials

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

**PAPER II
ECONOMIC THEORY**

TOTAL HOURS: 90

COURSE CODE: 171402

CREDITS: 6

L-T-P:

COURSE OBJECTIVES:

1. To gain knowledge about the general equilibrium analysis and its applicability in international trade
2. To impart knowledge about the social welfare function and criteria to evaluate them
3. To enable to understand several economic models of development
4. To understand recent advancement of monetary theories
5. To explain various facets of economics and inculcate in-depth knowledge in the subject

COURSE OUTLINE:

Unit I : The place of theory in Modern Economic Science –Marginalist analysis – General Equilibrium theory – Growth theory-Growth and Distribution theory –Two sector equilibrium model –Geometric treatment with application (eg) International trade and economic development

(15 Hours)

Unit II : Pareto and Rawls : Efficiency and equity –Social choice –Income distribution and equality

(15 Hours)

Unit III : Rudiments of Capital theory –Time and productivity ,Stock –Flow relationships , Measurement of Capital .Cambridge controversy –Recent Developments in Capital

theory –Human Developments in capital theory –Human Capital –Theory of Investment in Education –Emprical findings

(20 Hours)

Unit IV: Patinkin Model and other monetary models –Monetarist controversies : Friedman Gurley and Shah ,Marshall and Tobin,H.Johnson , John Hicks – Stagflation:Brahmananda Bernstein , I.G.Patel,Vakil

(20 Hours)

Unit V : Behaviour under uncertainty : expected utility hypothesis, mean variance analysis-Rcent trends in the theories of economics :

- I. Welfare economics .**
- II. Health Economics**
- III. Human resources**
- IV. Environmental Economics**
- V. Cultural Economics**
- VI. Urban economics**
- VII. Legal economics**
- VIII. Economics of Poverty**

(20 Hours)

RECOMMENDED BOOKS:

- 1. Growth Economics –A.K.Sen**
- 2. Money ,Interest and Prices –Don Patinkin**

REFERENCE BOOKS:

- 1.The Theory of Justice –RAWLS**
- 2. Indian economic Analysis –Bhagwati J and Chakravathi.S**

JOURNALS:

- 1. Journal of Economic Theory and Practice: SAGE**
- 2. Cambridge Journal of Economics**

E-LEARNING RESOURCES:

- 1. <https://www.grin.com> › document**
- 2. <https://arcdigital.media> › a-theory-of-justice-by-john-rawls-**
- 3. <https://www.cipd.co.uk> › Images › human-capital-theory**
- 4. www.economicdiscussion.net › money › quantity-theory-of-money**
- 5. <https://policonomics.com> › lp-welfare-economics1-welfare-economics**

COURSE OUTCOME:

1. Enable to gain knowledge about the state of general equilibrium and its implications
2. Understand the criteria to evaluate social welfare function
3. Understand the rudiments of physical capital and importance of human capital in the process of economic development
4. Comprehend monetary theories in the light of its potential contributors
5. Learns the subcategories of the subject and develops in-depth knowledge about them

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

PAPER III

CONTEMPORARY ECONOMIC ISSUES IN INDIA

TOTAL HOURS:90

COURSE CODE: 171403

CREDITS: 5

L-T-P:

COURSE OBJECTIVES:

1. To provide a macroeconomic understanding of the Indian economy.
2. The students become aware of various challenges of the Indian economy.
3. Understand the occupational structure in various sectors of the economy
4. Grasp the importance of availability of rich natural endowments to achieve sustainable development
5. To explain the trend in the inflow of foreign capital and growth of foreign trade

COURSE OUTLINE:

Unit I : India as a developing Economy -Basic Characteristics -Major issues of Development- National income estimates in India -Trends in distribution of National income growth and structure-Trends in the share of the Public sector -Urban and Rural Income Breakup -Limitations of National income estimation in India. Review of Recent Budget

(15 Hours)

Unit II : Size and growth of population in India -Population Dividend in India - Human Development in India -Human Development index for various States in India -Progress of Human Development in India -Social Infrastructure - Education -Progress of School - Higher Education in India-Health and Family Welfare -Progress - Health infrastructure in India -Issues of Health in Economic Development

(15 Hours)

Unit III Economic Development and Occupational Structure - Changing profile of GDP and employment in India -Relative shift in the shares of NSDP and employment in

**Agriculture ,Industry and Service Sector in India -share of Public Sector in Employment
-Work Participation rates in India**

(20 Hours)

Unit IV: Natural resources -Land - Forest - Water - Minerals -Economic Development and environmental degradation -Global Climate change in India. Infrastructure - Energy -Energy Crisis -measures -Power -Achievements - Future Direction - Road Development in India - Rural and Urban -Progress

(20 Hours)

Unit V: Performance of Agriculture, Manufacturing and Service Sector in India -RBI and its Functions -FDI and Economic Development. Foreign Trade in India - Composition - Direction -Performance- An analysis of Trends in Exports and Imports in India -India's Balance of Payment - recent Financial year.

(20 Hours)

RECOMMENDED BOOKS:

1. Indian Economy, Dhingra I.C, S. Chand and Sons
2. Indian Economy, Dutt and Sundaram, S. Chand and Sons

REFERENCE BOOKS:

1. Planning Commission Reports, Various Issues, GOI,
2. Economic Survey, Various Issues GOI

JOURNALS:

1. Economic and Political Weekly
2. Five Year Plan documents
3. Economic Survey

E-LEARNING RESOURCES:

1. <https://www.tutorialspoint.com> › Indian economy
2. <https://www.indiabudget.gov.in> › economic survey
3. www.sociologydiscussion.com › ... › Population › Occupational Structure
4. <https://www.trade.gov> › infrastructure › India
5. www.yourarticlelibrary.com › trade-2 › foreign-trade-salient-features

COURSE OUTCOME:

1. Develop ideas of the basic characteristics of the Indian Economy.
2. Understand the importance of agriculture as the foundation of economic growth and development.
3. Understand the causes and impact of population growth.
4. Learn about the five-year plans and its achievements and targets.
5. Identify and analyze current issues of foreign trade

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3

CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

**QUAID-E-MILLATH GOVERNMENT COLLEGE FOR
WOMEN (AUTONOMOUS), CHENNAI – 02**

PG & RESEARCH DEPARTMENT OF ECONOMICS

SYLLABUS - PG



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

OFFERED FROM THE ACADEMIC YEAR 2017-18

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Quaid – E –Millath Government College for Women

(Autonomous) Chennai - 600 002.

Post Graduate Courses

Choice Based Credit System

Quaid-E - Millath Government College for Women (Autonomous) offers the semester system of education with credits for P.G Courses. Credit is related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures/ tutorials / laboratory work/seminar/project work/practical training / viva voce etc., to facilitate effective teaching and learning and the credits are assigned accordingly depending on the content and the specialization.

The credit requirement for a two year PG course shall be 100 (90 for Core and Elective & 10 credits for soft skill papers & Internship)

Regulation

1. Duration

- a. There will be two semesters in each academic year. The first academic year shall comprise of the first & second semesters, the second academic year, the third & fourth semesters.
- b. The odd semester shall consist of the period from June to November of each year & the even semester from December to April of each year.

2. Course of Study

- a. The course of study for post graduate degree course shall comprise of Core courses & Electives.
- b. System of credits

Year	No. of Papers				Marks	Credits				
	Core	Elective	Extra-Disciplinary Elective	Soft Skill		Core	Elective	Extra-Dis. Elective	Soft Skill	Internship
I Year	7	3	1	2	1300	28	9	3	4	2
II Year	8	2	1	2	1300	32	6	3	4	
Total	15	5	2	4	2600	60	15	6	8	2

Passing Minimum

A candidate shall be declared to have passed in each paper/practical of the main subject of study wherever prescribed if she secures NOT LESS THAN 50% of the marks prescribed for the examinations. She shall be declared to have passed the whole examination, if she passes in all papers & practical's wherever prescribed as per the scheme of examinations earning 90 credits.

Eligibility for the Award of Degree

Candidates must secure a minimum of 50% marks in the Semester End Examinations. A candidate must secure 8 credits in soft skills and 2 credits in internship in addition to 90 credits from core and elective courses to obtain a Post Graduate Degree.

Ranking

Candidates who pass all the examinations prescribed for the course in the **FIRST APPEARANCE ALONE** are eligible for Classification/ Ranking/ Distinction.

Distribution of Marks for Continuous Assessment

Test			Best 2 Out of 3	Assignment	Seminar / Creative Presentation	Model Exam	Attendance	Total	Reduced to
20	20	20	40	10	15	25	10	100	25

Test (Best two out of three)	:	40 Marks
Assignment/ Seminar / Creative Presentation	:	25 Marks
Model Examination	:	25 Marks
Attendance	:	10 Marks
Total (Internal)	:	100 Marks reduced to 25

Calculation of Attendance Marks

90 – 100%	-	10 Marks
80 – 89%	-	9 Marks
75 – 79%	-	8 Marks
65 – 74%	-	7 Marks
55 – 64%	-	5 Marks
Below 55%	-	0 – Not Eligible

CA QUESTION PATTERN-PG

Knowledge Level	Section	Word Limit	Marks	Total
K 4	A -2/4 X5	500	10	50
K4, K5	B -2/3 X20	1200	40	

PG COURSES

The Total Credits Allotted for PG Courses is Minimum Of 90 Credits

Sl.No	Paper	No of Papers	Credits	Total credits
1	Core Subjects	15	4	60
2	Soft Skills	4	2	8
3	Internship*	-	2	2
4	Elective Subjects	5	3	15
5	Extra Disciplinary Elective Subjects	2	3	6
	Total			91

***internship will be carried out during the summer vacation of the II semester**

The above-mentioned distribution structures shall be followed by all colleges and universities and without any alterations;

Extra disciplinary subjects should be allocated in the II & III semester alone for all PG Courses

PROGRAMME OUTCOME

On completion of the programme the learner is able to

- 1. Apply quality skills in all modes**
- 2. Identify the essence of subject knowledge**
- 3. Demonstrate entrepreneur, creative and communicative skills**
- 4. Acquire thorough knowledge of the subject**
- 5. Analyse the fundamental research**

PROGRAMME SPECIFIC OUTCOME FOR PG

- 1. Enlightens the students with in-depth knowledge on Micro and Macro aspects of Economic Theories**

2. Enhance the skill to interpret the process of economic development at the national and international system
3. Gives an understanding about the growing nature of Indian economy and issues and challenges faced by the country
4. Develops an insight to evaluate socio-economic policies using mathematical and analytical skills gained during the course
5. Motivates to inculcate research ability and pursue higher education

Programme Profile- PG ECONOMICS

EMESTER	S.NO	TITLE OF THE PAPER	PAPER CODE	LECTURE HOURS	CA	SEM	TOTAL MARKS	CREDITS
I	1	Micro Economics I	175201	6	25	75	100	4

	2	Contemporary Economic Issues of India I	175202	6	25	75	100	4
	3	Monetary Economics	175203	6	25	75	100	4
	4	Growth and Development I	175204	6	25	75	100	4
	5	Statistics For Economists	175205	6	25	75	100	3
		Soft Skill	175001	2				2
II	1	Micro Economics II	175206	6	25	75	100	4
	2	Contemporary Economic Issues of India II	175207	6	25	75	100	4
	3	Public Finance	175208	6	25	75	100	4
	4	Growth and Development II	175209	5	25	75	100	3
	5	Mathematical Economics	175210	5	25	75	100	3
	EDE	Human Resource Management	175211	2	25	75	100	3
		Soft Skill	175002	2				2
		Soft Skill Internship						2

SEMESTER	S.NO	TITLE OF THE PAPER	SUBJECT CODE	LECTURE HOURS	CA	SEM	TOTAL MARKS	CREDITS
III	1	Macro Economics I	175212	6	25	75	100	4
	2	International Economics I	175213	6	25	75	100	4
	3	Econometrics I	175214	6	25	75	100	4
	4	Financial Economics	175215	5	25	75	100	4
	5	Environmental Economics	175216	5	25	75	100	3
		Soft Skill	175003	2				2
	EDE	PRINCIPLES OF MANAGEMENT	175217	2	25	75	100	3
IV	1	Macro Economics II	175218	6	25	75	100	4
	2	International Economics II	175219	6	25	75	100	4
	3	Econometrics II	175220	6	25	75	100	4
	4	Research Methodology	175221	6	25	75	100	4
	5	Labour Economics	175222	5	25	75	100	3
		Soft Skill						2

RUBRICS FOR CONTINUOUS ASSESSMENT

S.No.	Component	Criteria
1	Assignment	Content Originality Presentation Schematic Representation Diagram Bibliography
2	Seminar	Organisation Subject Knowledge Visual Aids Confidence level Presentation Communication Language
3	Field Visit	Participation Preparation Attitude Leadership
4	Participation	Answering Questions Clearing Doubts Participating in Group Discussions Regular Attendance

END SEMESTER EVALUATION PATTERN – P.G.,

THEORY PAPERS

SEMESTER I/II/III/IV

DOUBLE VALUATION BY COURSE TEACHER AND EXTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARKS : 38

PRACTICAL PAPERS

SEMESTER I/II/III/IV

VALUATION BY EXTERNAL EXAMINER AND INTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARK : 38

SOFT SKILLS PAPERS

SEMESTER I/II/III/IV

SINGLE VALUATION BY INTERNAL EXAMINER

MAXIMUM MARKS : 60

PASSING MARKS : 30

PROJECT PAPER

SEMESTER IV

DOUBLE VALUATION BY RESEARCH SUPERVISOR AND EXTERNAL EXAMINER

DISSERTATION : 75

VIVA-VOCE:25

MAXIMUM MARKS : 100

PASSING MARKS : 50

INTERNSHIP

YEAR II

SEMESTER IV

MAXIMUM MARKS : 100

PASSING MARKS : 50

**I YEAR
SEMESTER I**

MICRO ECONOMICS-I

TOTAL HOURS: 90

COURSE CODE: 175201

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. The course provides an introduction to a core area of economics by explaining the basic concepts.
2. The course considers explaining the operation of the market economy and the problem of how best to allocate the society's scarce resources.
3. The course aims to develop an understanding of the framework that economists used to analyses how choices are made by the individuals.
4. The course explains the economic behavior of individuals, firm and market.
5. The course is mainly concerned with the objective of equipping the students in comprehensive manner with the various aspects of consumer behavior and demand analysis, production theory and behavior of costs.

COURSE OUTLINE:

UNIT-I

Definition- Methodology of Economics- Deductive Method- Testing of Economic Hypotheses Through Statistical Method- Inductive Method- Economic Static and Dynamics.

(15 Hours)

UNIT-II

Revealed Preference Theory of Demand- deriving demand theorem from revealed preference hypotheses-superiority and defects of the Revealed Preference Theory. Hicks logical ordering of demand -strong and weak ordering -differentiated -direct consistency test-derivation of law of demand through logical weak ordering approach

(15 Hours)

UNIT-III

Theory of consumer choice under risk- The Bernoulli Hypothesis- Neumann-Morgenstern method of measuring utility- Friedman-Savage Hypothesis- Markowitz hypothesis

(20 Hours)

UNIT –IV

Theory of production- production function- economies of scale- internal and external economies- production possibility curve- iso-quant analysis- Principle of Marginal Rate of Substitution-the ridge lines-iso cost curve and expansion path-linear homogenous production function

(20 Hours)

UNIT-V

Return to scale- constant return to scale-increasing return to scale- Decreasing return to scale- cost-output relationship in the short run –long run cost curves-revenue curves

(20 Hours)

RECOMMENDED BOOKS:

1. **Modern Micro Economics , Theory and Applications, H.L.Ahuja , S.Chand**
2. **Advanced Economic Theory, H.S.Agarwal, Konark Publishers**

REFERENCE BOOKS:

1. **Modern Micro Economics, Koutsoyiannis, Macmillan Press**
2. **Advanced Economic Theory, M.L.Jhingan, Vrinda Publications**

JOURNALS

1. **American Economic Journal: Microeconomics**
2. **Studies in Microeconomics: SAGE Journals**

E-LEARNING RESOURCES

1. https://economicsconcepts.com/methods_of_economic_analysis.htm
2. <https://www.britannica.com/topic/revealed-preference-theory>
3. <http://www.yourarticlelibrary.com/economics/theory-of-consumer-choice-under-risk-in-economics-managerial-economics>
4. <https://www.britannica.com/topic/theory-of-production>
5. <http://www.economicsdiscussion.net/revenue/revenue-curves-under-different-markets-with-diagram>

COURSE OUTCOME:

1. **Enable to explain the methodology of Economics.**
2. **Able to understand the concept of preference and derive demand curve from the concept of Revealed Preference.**
3. **Able to differentiate between risk and uncertainty.**
4. **Able to identify different types of cost curves and its impact.**
5. **Explain the concept of revenue curves in different market.**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

CONTEMPORARY ECONOMIC ISSUES OF INDIA I

TOTAL HOURS: 90

COURSE CODE: 175202

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

- 6. To provide a macroeconomic understanding of the Indian economy.**
- 7. The students become aware of various challenges of the Indian economy.**
- 8. Understand the importance, cause and impact of population growth and its distribution.**
- 9. Grasp the importance of planning undertaken by the government, have knowledge on the various objectives.**
- 10. Make them aware of the availability of rich natural endowments to achieve sustainable development.**

COURSE OUTLINE:

UNIT I

Economic Development- Basic features of Indian Economy as Developing Economy- Indicators of Economic development- Human Development Index- Progress of HDI in India

(10 Hours)

UNIT II

Population: The Theory of Demographic Transition –Size and Growth of Population in India –Birth Rate –Death Rate –The Sex Composition of Population –Age Composition – Density of Population -Urbanisation –The Quality of Population-demographic dividend

(20 Hours)

UNIT III

Planning in India: Meaning, Types and Models- Mahalanobis, Input Output Multi Sectoral model– Planning Commission – Overview of Indian Five year plans, Eleventh Five Year Plan –Evaluation and Appraisal of Eleventh Five Year Plan - Twelfth Five year Plan – Objectives

(20 Hours)

UNIT IV

Agriculture: Implications of land Reform-Technological changes in Agriculture – Role of agricultural financial institutions in agricultural development-Pricing of Agricultural products– Recent Trends in Agricultural Marketing.

(20 Hours)

UNIT V

Food Security- food self-sufficiency- public distribution system- its impact on poverty- Food Insecurity at the global Level-WTO and its implications in Agriculture

(20 Hours)

RECOMMENDED BOOKS

Indian Economy, Dhingra I.C, S.Chand and Sons

Indian Economy, Dutt and Sundharam, S.Chand and Son

REFERENCE BOOKS:

Indian Economy, Dhingra I.C, S.Chand and Sons

Planning Commission Reports, GOI, Various Issues

Indian Economy, Misra, S, & Puri, V

The Economics of Development and Planning, Jhingan M.L

JOURNALS

4. Economic and Political Weekly

5. Five Year Plan documents

6. Economic Survey

E – LEARNING RESOURCES

1. <https://jagranjosh.com>

2. <http://socialsci.libretexts.org>

3. <http://www.businessmanagementideas.com>

4. <https://www.ibef.org>

5. <https://www.tutorialspoint.com>

COURSE OUTCOME:

- 6. Develop ideas of the basic characteristics of the Indian Economy.**
- 7. Understand the importance of agriculture as the foundation of economic growth and development.**
- 8. Understand the causes and impact of population growth.**
- 9. Learn about the five-year plans and its achievements and targets.**
- 10. Identify and analyse current issues**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

MONETARY ECONOMICS

TOTAL HOURS:90

COURSE CODE: 175203

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. To familiarize the students the advent of money and compare the traditional and modern views on functions of money
2. To give an insight to circular flow of money and its importance
3. To impart knowledge on features, Phases of business cycles and pertinent theories which provide explanation of occurrence of business cycles
4. To acquaint students about the mode of functions of Money market and their elements
5. To enlighten about objectives and instruments of monetary policy and the scope of expansionary and restrictive monetary policy

COURSE OUTLINE

UNIT I

Money- Stages in the Evolution of Money- definition of money- Traditional Definition- Friedman's Definition-Radcliff's Definition-Gurley and Shaw's Definition- Functions of Money.

(15 Hours)

UNIT II

The Circular Flow of Money- Household Sector- Business Sector-Capital Market-Government Sector- Foreign Sector –Importance of Circular Flow of Money.

(15 Hours)

UNIT III

Commercial Banks- types- functions0 credit creation- RBI- Issue of currency- functions- credit control measures- Repo rate- Statutory liquidity ratio

(20 Hours)

UNIT IV

Indian Money Market-Features- Functions- Constituents of Indian Money Market- Defects- Suggestions to Improve Money market

(20 Hours)

UNIT V

Monetary Policy-Meaning- Objectives-Instruments of Monetary Policy- Scope and Limitations of Expansionary and Restrictive Monetary Policy.

(20 Hours)

RECOMMENDED BOOKS:

1. Gupta S.B. - Monetary Economics
2. Seth M.L. - Money, Banking and International Trade
3. Sankaran S. - Monetary Economics

REFERENCE BOOKS:

1. Kurihara K. - Monetary Theory and Public Policy
2. Narendra Jadhav - Monetary Economics for India
3. Vaish M.C - Monetary Theory

4. Cauvery & Sudha Nayak- Monetary Economics

JOURNALS:

1. Journal of Monetary Economics Articles - Elsevie
2. International Journal of Monetary Economics and Finance
3. Journal of Monetary Economics – Scimago

E-LEARNING REOSURCES:

1. www.shareyouressays.com › 4-different-approaches-to-the-demand for money
2. <https://www.masterclass.com> › articles › understanding-the-circular-flow-money
3. <https://www.intelligenteconomist.com> › business-cycle
4. <https://www.economiclive.com> › reforms-in-Indian-money-market
5. www.yourarticlelibrary.com › economics › the-expansionary-monetary-policy

COURSE OUTCOME:

1. Enable to understand the evolution of money and the theories pertaining to functions of money
2. Gets Familiarized about the path of circular flow of Money and its importance
3. Gain knowledge about the occurrence and different phases of business cycles
4. Understand the functions of money market and the role of constituents influencing the money market
5. Recognize the objectives and instruments of monetary policy and the scope of expansionary and restrictive monetary policy

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

GROWTH AND DEVELOPMENT –I

TOTAL HOURS: 75

COURSE CODE: 175204

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. To impart ideas on economic development and economic growth and its determinants
2. To familiarize the students about the index of measuring economic development
3. To prepare the students to understand modern economic growth and objectives of sustainable development
4. Tracing the evolution of theories of economic development
5. To understand the Rostow's stages, Lewis and Lebeinstein theories of economic growth

COURSE OUTLINE:

UNIT I

Economic development-meaning- features of economic development-factors determining economic development- obstacles to economic development- Economic growth-definition- distinction between economic development and economic growth.

(15 Hours)

UNIT II

Measuring Economic development- Gross National Product-Per capita Income— Physical Quality of Life Index-Human Development index- meaning – construction of PQLI and HDI- critical aspects of measures.

(15 Hours)

UNIT III

Modern economic growth- meaning – characteristics-sustainable development-meaning- objectives-features- strategies for sustainable development

(15 Hours)

UNIT IV

Classical theories of economic development- features of classical theory-Adam Smith- David Ricardo-Malthus – Mill's theory

(15 Hours)

UNIT V

Rostow's stages of economic growth- Lewis theory of unlimited supply of labour-Nurkse theory of disguised unemployment- Leibenstein's critical Minimum Effort thesis.

(15 Hours)

RECOMMENDED BOOKS

M.L. Jhingan – The Economics of Development and Planning

Agrawal, A.N-Indian Economy: Problems of Development and Planning

REFERENCE BOOKS:

E. Wayne Nafzige- Economic Development

Agarwal. R.C - Economics of Development & Planning

JOURNALS:

1. Indian Growth and Development Review - Emerald Insight

2. International Journal of Growth and Development

E-LEARNING RESOURCES

1. kokminglee.125mb.com/economics/sourcesdev.html

2. [https://economicsconcepts.com/human_development_index_\(hdi\).htm](https://economicsconcepts.com/human_development_index_(hdi).htm)

3. <https://web.stanford.edu/~chadj/facts.pdf>

4. <https://cruel.org/econthought/essays/growth/classicalgrowth.html>

5. <https://www.economicshelp.org/blog/57/growth/explaining-theories-of-economic-growth/>

COURSE OUTCOME:

1. Enables to gain knowledge on economic development and economic growth and its determinants
2. Gets familiarized about the index of measuring economic development
3. Understands modern economic growth and objectives of sustainable development
4. Enables to trace the evolution of theories of economic development
5. Understands the Rostow's stages, Lewis and Lebeinstein theories of economic

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

STATISTICS FOR ECONOMISTS

TOTAL HOURS:75
CREDITS: 3

COURSE CODE: 175205
L-T-P:

COURSE OBJECTIVES:

- 1. To understand the concept of probability and baye's theorem.**
- 2. To be familiar with basic probability concepts and probability distributions**
- 3. To understand the concept of normal distribution and its significance**
- 4. To Impart thorough knowledge about binomial distribution**
- 5. To be exposed in testing the hypotheses through chi-square**

COURSE OUTLINE:

UNIT 1 : Correlation and Regression analysis - Scatter diagram- Graphic- Karl pearson's Coefficient- Rank correlation- Regression analysis-Simple problems.

(15 Hours)

UNIT 2 : Probability Analysis - Defining probability - Importance of the concept - Theorems of probability - Addition multiplication and Baye's theorem- Simple problems.

(15 Hours)

UNIT 3: Binomial - Binomial process -Definition – properties- Simple problems

(15 Hours)

UNIT 4 : Normal Distribution - Importance - Characteristics of the Normal Distribution - Area under the curve - In Area relationship Normal curve - Simple problems.

(15 Hours)

UNIT 5: Chi square - Definition, properties - Merits and Demerits - Goodness of Fit - Simple problems.

(15 Hours)

RECOMMENDED BOOKS.

- 1. S.P.GUPTA . Statistical Methods , Sultan Chand and Sons.**

2. **G.S. MONGA. Mathematics and Statistics for Economics. Vikas Publishing house Pvt. Ltd., New Delhi.**

REFERENCE BOOKS:

3. **Mason, Lind and Marchall. Statistical Techniques in Business and Economics. McGraw Hill.**

JOURNALS:

1. **International Journal of Statistics & Economics**
2. **Business and Economics Journal- Open Access Journals**
3. **Statistics for Economics: A BEGINNING - U of T : Economics**

E-LEARNING RESOURCES

1. https://www.academia.edu/36871915/Statistics_for_Economists
2. <https://digitaldefynd.com/best-statistics-for-economist-courses/>
3. <https://sjes.springeropen.com/>
4. <https://www.mytutorsonline.org/>
5. <http://www.quora.com>
6. <https://www.ebooksdownloads.xyz/search/applied-statistics-for-economis>

COURSE OUTCOME:

1. **Understanding the core economic issues through statistical tools of analysis**
2. **Enabling to understand the analysis of probability and its theorems**
3. **Understand the binomial distribution**
4. **Identifying the area under curve and define the normality of distribution**
5. **Enables to test association between the economic variables and interpret the results**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	2	3	3
CO4	3	2	3	3	3
CO5	3	3	3	3	3
Average	3	2.8	2.8	3	3

**I YEAR
SEMESTER II**

MICRO ECONOMICS-II

**TOTAL HOURS: 90
CREDITS: 4**

**COURSE CODE: 175206
L-T-P:**

COURSE OBJECTIVES:

1. To understand the nature of competitive markets and understand the power monopoly and method of attaining equilibrium
2. To understand price and output determination under imperfect competition
3. To understand the cut-throat competition between oligopolist and understanding between duopolies
4. To explore the varying objectives of firm apart from traditional objectives
5. To understand the tools of analyzing general equilibrium and efficiency conditions

UNIT-I

Perfect competition-features-price determination in the short run and long run- Monopoly-price output equilibrium under monopoly-monopoly equilibrium and price elasticity of demand- reasons of monopoly power –Discriminating monopoly- equilibrium under price discrimination

(20 Hours)

UNIT-II

Monopolistic competition- features- price output equilibrium under monopolistic competition- Group equilibrium- selling cost- excess capacity under monopolistic competition -pricing and output determination under bilateral monopoly and monopsony

(20 Hours)

UNIT-III

Oligopoly- features- collusive oligopoly: Cartels- Kinked demand- duopoly – Cournot's model- Chamberlin model

(15 Hours)

UNIT-IV

Equilibrium of the firm- objectives of the firm- Baumol's sales revenue maximization- Growth maximization theory of Marris- behavioural theory of Cyert and March

(15 Hours)

UNIT-V

General equilibrium analysis- Edgeworth Box-Pareto optimality-condition-efficiency in exchange-efficiency in production-efficiency in product mix

(20 Hours)

RECOMMENDE BOOKS:

1. Modern Micro Economics, Theory and Applications, H.L.Ahuja , S.Chand
2. Advanced Economic Theory, H.S.Agarwal, Konark Publishers

REFERENCE BOOKS:

1. Modern Micro Economics, Koutsoyiannis, Macmillan Press
2. Advanced Economic Theory, M.L.Jhingan, Vrinda Publications

JOURNALS:

1. American Economic Journal: Microeconomics

2. Studies in Microeconomics: SAGE Journals

E-LEARNING RESOURCES:

1. <https://courses.lumenlearning.com/boundless-economics>

2. <https://www.intelligenteconomist.com/market-structure-oligopoly>

3. <https://www.economicshelp.org> > ... > Types of market structure

4. www.economicsdiscussion.net > business > 7-main-objectives-of-a-business

5. <https://policonomics.com/lp-welfare-economics1-general-equilibrium>

COURSE OUTCOME:

1. Enables to understand the nature of perfect competition and the extreme form of monopoly power and its impact
2. Gets familiarized about the method of price and output determination under imperfect competition
3. Induce reasoning ability about the causes the stiff competition between oligopolist
4. Enables to understand the objectives of traditional and modern firms
6. Understanding the efficiency conditions required for attaining general equilibrium

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	2	3	3	3
CO5	3	3	3	3	3
Average	3	2.8	3	3	3

CONTEMPORARY ECONOMICS ISSUES OF INDIA II

TOTAL HOURS: 90

COURSE CODE: 17207

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. To familiarize the growth and performance of textile, Petro chemical and information technology industries, and the problems and prospects of small-scale industry
2. To analyse the importance of infrastructure for economic development
3. Explore the significance of social sector in economic development
4. To expose the pivotal role played by health care in promoting human capital
5. Tracing the pattern of foreign trade since independence to post-liberalisation and its current situations

COURSE OUTLINE:

UNIT I

Industrial Growth in India -Performance of Textiles, Petro chemical and Information Technology Industry - Small Scale Industry –Output and Employment of Small scale Enterprises –Policies and Programmes to remove disabilities of the SSE

(10 Hours)

UNIT II

Infrastructure and Economic Development –Importance - Energy –Sources –Availability of Primary Energy in India –Energy Crisis –Measures Taken-Renewable Energy Potential –Power – Sources of Electric Power -Targets and Achievements –Rural Electrification

(20 Hours)

UNIT III

Social Sector – Education –Progress of Education in India -School –Higher Education-Technical Education –Vocational Education

(20 Hours)

UNIT IV

Health and Family Welfare -Health Indicators in India -Health Expenditure in India – National Rural Health Mission –National Urban Health Mission Programmes - Objectives and Achievements.

(20 Hours)

UNIT V

Foreign trade in India – Structural changes – Direction of trade – Terms of trade – recent balance of payment position in India. Foreign capital in India – external assistance – external commercial borrowing – NRI deposits – foreign investment - External debt.

(20 Hours)

RECOMMENDED BOOKS:

- 1 .Indian Economy, Dhingra I.C ,S.Chand and Sons 2011
2. Indian Economy, Dutt and Sundharam, S.Chand and Sons, 2013

REFERENCE BOOKS:

1. Planning Commission Reports, GOI, Various Issues

JOURNALS

1. Economic and Political Weekly
2. Five Year Plan documents
3. Economic Survey

E-LEARNING RESOURCE

1. www.preservearticles.com › difference › difference-between-small-scale-industries.
2. <https://www.india.gov.in> › topics › infrastructure
3. www.studyguideindia.com › Education-India
4. <https://www.ibef.org> › industry › healthcare-india
5. <https://www.indiantradeportal.in>

COURSE OUTCOME:

1. Get familiarized about the growth and performance of major industries and the problems of small-scale industries
2. Acquaint the significance of infra structure for economic development
3. Exploring the importance of education in enhancing socio-economic development
4. Understanding indicators of health and its status in urban and rural India
5. Tracing the evolution pattern of foreign trade during pre and post liberalization periods

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

PUBLIC FINANCE

TOTAL HOURS:90

CREDITS: 4

COURSE CODE: 17208

L-T-P:

COURSE OBJECTIVES:

1. A knowledge and understanding of key economic issues in public finance
2. To understand the sources of public revenue
3. To explore the different sources of public expenditure and its theories
4. To understand the public debt and redemption methods in India
5. To study the process of budgeting and implications of deficit financing

COURSE OUTLINE:

UNIT I

Public Finance- Meaning-Importance-Private and Public Finance Comparison- Principle of Maximum Social Advantage

(10 Hours)

UNIT II

Public Revenue- Meaning- Sources of Public Revenue-various classifications- Principles of Taxation- Benefit Principle- Ability to Pay Theory- Criteria for ability- Effects of Taxation on Production and Distribution.

(20 Hours)

UNIT III

Public Expenditure- reasons for the growth of public expenditure-Voluntary exchange Theory of Lindahl- Peacock –Wiseman Hypothesis- Effects of Public Expenditure on Economic Development.

(20 Hours)

UNIT IV

Public Debt- Objectives-Classification of Public Debt- Redemption of Public Debt- Methods- Advantages of redemption Effects of Public Debt.

(20 Hours)

UNIT V

**Budgeting- Meaning – Implications of Balanced Budget and Unbalanced Budget-Types – process of budgeting- qualities of a good budget -Deficit financing – Meaning –objectives
- FRBM Act 2003**

(20 Hours)

RECOMMENDED BOOKS:

Bhatia - Public finance.

Sankaran. S - Fiscal Economics.

REFERENCE BOOKS:

Bhargava R.N. - Indian public finance.

Sundaram K.P.M. - Fiscal Economics.

K.P.M. Sundaram - Public Finance Theory and Practice

JOURNALS

1. Public Finance Review: SAGE Journals

2. International Journal of Public Finance

E-LEARNING RESOURCE:

1. <https://notes.tyrocity.com › difference-private-public-finance>
2. www.yourarticlelibrary.com › finance › public-revenue-meaning
3. <https://www.ukessays.com › essays › review-of-theories-on-government->
4. www.economicdiscussion.net › debt-2 › public-debt-meaning-objectives
5. https://www.indiabudget.gov.in › demands_grants_central_government

COURSE OUTCOME:

1. Insight in to public finance in India and key economic issues in public finance
2. Understand the sources and principles of determining public
3. Exploring the theoretical background of public expenditure
4. Understanding the implications of public debt and redemption measures in India
5. Exploring the types and process of budget

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	2	3	3	3
CO5	3	3	3	3	3
Average	3	2.8	3	3	3

GROWTH AND DEVELOPMENT –II

TOTAL HOURS:75

CREDITS: 5

COURSE CODE: 175209

L-T-P:

COURSE OBJECTIVES:

1. To understand the growth models
2. To explore the neo-classical growth models
3. To familiarize the impact of technical change on economic growth
4. To understand the importance of capital formation
5. To explore different venues of foreign capital

COURSE OUTLINE:

UNIT VI-

Balanced and un-balanced growth- Rosenstein Rodan's big push theory- Harrod-Domar growth model- Myrdal's theory of circular causation.

(15 Hours)

UNIT VII-

Joan Robinson model- golden rule- representation of golden rule- Mead's neoclassical growth model.

(15 Hours)

UNIT VIII-

Models of technical change- Hicks Neutral technical change – Labour saving technical change- capital saving technical change- Harrod Neutrality.

(15 Hours)

UNIT IV-

Capital Formation- importance-reasons for low rate of capital formation—sources of capital formation.

(15 Hours)

UNIT V-

Foreign capital-meaning-types- role of foreign capital- MNC's- meaning-features- advantages and disadvantages of MNC's.

(15 Hours)

RECOMMENDED BOOKS

- 1.M.L. Jhingan – The Economics of Development and Planning
2. Agrawal, A.N-Indian Economy : Problems of Development and Planning

REFERENCE BOOKS

1. E. Wayne Nafzige- Economic Development
2. Agarwal. R.C - Economics of Development & Planning

JOURNALS:

3. Indian Growth and Development Review - Emerald Insight
4. International Journal of Growth and Development

E-LEARNING RESOURCE:

1. www.economicsdiscussion.net › unbalanced-growth-theory
2. <https://www.coursera.org>
3. <https://www.oxfordreference.com> ›
4. www.economicsdiscussion.net › india › capital-formation-in-india
5. <https://www.businessmanagementideas.com> › essays › essay-on-foreign-capital

COURSE OUTCOME:

1. Clear understanding of balanced and unbalanced growth
2. Explore the golden rule and models of neo-classical economists
3. Understanding the impact labour and capital technology through economic models
4. Get an insight in to the significance of capital formation
5. Understanding the role of MNCs for the inflow of foreign capital

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	2	3	3
CO4	3	2	3	3	3
CO5	3	3	3	3	3
Average	3	2.8	2.6	3	3

MATHEMATICAL ECONOMICS

TOTAL HOURS:75

COURSE CODE: 175210

CREDITS: 3

L-T-P:

COURSE OBJECTIVES:

1. 1.To gain an understanding of core Mathematical principles
2. To understand the fundamentals of matrix
3. To understand the concept of derivatives and its rules
4. To understand the application of differentiation
5. To explore second order derivatives

COURSE OUTLINE:

UNIT 1: An Introduction to Mathematical Economics - Mathematical Economics – Definition - Nature and Scope of mathematical Economics - Relationship between Mathematical Economics and Economics -Limitations of the use of mathematics in economics.

(15 Hours)

UNIT 2: Fundamentals of Matrix Algebra - Definition and terms - Basic operations in Matrices - Determinant properties, Inverse matrices - Properties of Inverse Matrices – Crammer’ s Law.

(15 Hours)

UNIT 3: The derivatives - Simple rules of differentiation, Product rule, Quotient rule , Function of function rule -Relationship between AR and MR, AC and MC Using differentiation.

(15 Hours)

UNIT 4: Application of Differentiation, Calculation of Marginal cost and Average Cost, Marginal revenue and Average revenue.

(15 Hours)

UNIT 5: Second order Derivatives -Maximization and Minimization of a function- Economic applications Output and Revenue maximization, profit maximization.

(15 Hours)

RECOMMENDED BOOKS:

1. Metha B.C. and Madnani G.M.K. (1997) . Mathematics for Economists,
2. Sultan Chand and Sons Publishers, New Delhi.
3. Yamane Taro (1976) . Mathematics for Economists. An Elementary
4. McGraw Hill International Students Edition. Survey, Prentice Hall of India Pvt. Ltd, New Delhi.

REFERENCE BOOKS:

1. Weber, Jean.E (1982). Mathematical Analysis. Business and Economic Applications, Harper and Row publishers, New York .
2. Chiang A.C (1985), Fundamental Methods of Mathematical Economics,

E-RESOURCES

1. [https://digitaldefynd.com/best-mathematical economics -courses/](https://digitaldefynd.com/best-mathematical-economics-courses/)
2. <https://www.mytutorsonline.org/>
3. <https://www.thoughtco.com/definition-of-mathematical-economics>
4. <https://mitpress.mit.edu/books/mathematics-economics-third-edition>
5. [https://in.zapmetasearch.com/Mathematics In Economics](https://in.zapmetasearch.com/Mathematics-In-Economics)

COURSE OUTCOME:

1. Enable to solve mathematical and economic models using a broad range of significant mathematical techniques.
2. Will be able to recognize the constitutes mathematical and economic thinking,
3. Enable to communicate economic and mathematical ideas and arguments.
4. Prepares to use mathematics and the tools of economics in their future endeavor.

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	2	3	3
CO4	3	2	3	3	3
CO5	3	3	3	3	3
Average	3	2.8	2.6	3	3

HUMAN RESOURCE MANAGEMENT

TOTAL HOURS: 30

COURSE CODE: 175211

CREDITS: 3

L-T-P:

COURSE OBJECTIVES:

1. To understand the nature and features of human resource management and personnel management
2. To outline the evolution of HRM, its objectives and the role of HR managers
3. Explain the importance of Human Resource Planning and the factors influencing it
4. To comprehend the process of recruitment and the factors determining the process
5. To elucidate the types of selection process and interviews followed for selection

Unit - I

Introduction to Human Resource Management - Definition - Characteristics - Human Resource Management and Personnel Management - Distinction.

(5 Hours)

Unit - II

Evolution of Human Resource Management - Functions of Human Resource Management - Managerial Functions - Operational Functions – Objectives of Human Resource Management - Role of Human Resource Manager.

(10 Hours)

Unit - III

Human Resource Planning - Meaning - Definition - Importance of Human Resource Planning - Characteristics of Human Resource Planning - Factors influencing Human Resource Planning - Limitations of Human Resource Planning.

(5 Hours)

Unit - IV

Recruitment - Sources of Recruitment - Internal and External Sources - Factors determining Recruitment.

(5 Hours)

Unit - V

Selection - Meaning - Definition - Selection Process - Tests - Interview - Types of Interview.

(5 Hours)

RECOMMENDED BOOKS:

1. Decenzo and Robbins, Human Resource Management, Wilsey, 8th edition, 2007.
2. Dessler, Human Resource Management, Pearson Education Limited, 2007.

REFERENCE BOOKS:

1. Mamoria C.B. Mamoria.S, Personnel Management, Himalaya Publishing Company, 2007.
2. Bernadin, Human Resource Management, Tata Mcgraw Hill, 6th Edition, 2006

COURSE OUTCOME:

1. Enables to understand the nature and features of human resource management and personnel management
3. Acquire knowledge about the evolution of HRM, its objectives and the role of HR managers
4. Elucidate the importance of Human Resource Planning and the factors influencing it
5. Understand the process of recruitment and the factors determining the process
6. Gets familiarized about the types of selection process and interviews followed for selection

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

II YEAR SEMESTER III

MACRO ECONOMICS -I

TOTAL HOURS:90

CREDITS: 4

COURSE OBJECTIVE:

COURSE CODE: 175212

L-T-P:

1. This course introduces students to the basic concepts of macroeconomics.
2. The aim is to equip the students with various theories of income determination, money supply and price-wage relationships.
3. Problems related to unemployment, inflation, relevance of policy measures are familiarized to students.
4. Familiarize the student with the generally accepted principles of macroeconomics.
5. Some relevant policy issues are covered as well.

COURSE OUTLINE:

UNIT-I

Social Accounting-Importance of social accounting-Difficulties of social accounting-Input-Output Accounting-Limitations of Input-Output Accounting-Flow of Funds Accounts-Balance of Payment Accounts

(15 Hours)

UNIT-II

Classical Theory of Employment-Criticism of Classical Model-Keynesian Theory of Employment-Criticism of Keynesian Model

(11 Hours)

UNIT-III

Consumption Function-Reconciliation of short run and Long run consumption function- Absolute Income, Relative Income, Life cycle and Permanent Income hypotheses - Investment-Determinants of Investment-Investment Multiplier-Leakages of Multiplier- Principle of Acceleration-The Multiplier and Accelerator Interaction

(19 Hours)

UNIT-IV

Trade Cycles-Characteristics- Phases of trade cycle- causes-Schumpeters innovation theory- Keynes theory- Hicks theory

(21 Hours)

UNIT-V

Equilibrium of Economy's Real and Monetary sectors-Goods Market-Money Market- Real sector equilibrium-Monetary sector equilibrium-General Equilibrium-Elasticities of IS and LM curves and Monetary, Fiscal Policies

(21 Hours)

RECOMMENDED BOOKS:

1. N.Gregory Mankiw (1999) Macro Economics, Worth Publishers, New York

2. Shapiro, Edward, Macro Economic Analysis, Golgotia Publications, New Delhi

REFERENCE BOOKS

1. Roger.E.A.Farmer (2002) Macro Economics, Thompson Asia Pte Ltd, Singapore
2. Ackley, Gardner. Macro Economic Analysis:Theory and Policy Macmillan Publishers ,New York

JOURNALS

1. Journal of Macroeconomics, Editors
2. South Asian Journal of Macro Economics and Public Finance
3. Macroeconomics and Finance in Emerging Market Economies

E - LEARNING RESOURCES

1. <https://www.khanacademy.org/economics-finance-domain/macroeconomy>
2. <https://www.nabe.com> > nabe > NABE > CBE > Exam > Macroeconomics_
3. <https://courses.lumenlearning.com/wm-macroeconomics>
4. www.economicdiscussion.net > essays > economics > macroeconomics
5. <https://global.oup.com/orc/busecon/economics>

COURSE OUTCOME:

1. Describe the principles of macroeconomics in relation to measuring national economic goals of economic growth, full employment and price-level stability
2. Apply macroeconomic measures to analyse unemployment and inflation including contrasting economic views on unemployment.
3. Explain the components of aggregate economic activity, fluctuations and effects for the national economy and how fiscal policy is used to achieve economic goals.
4. Explain how the components of monetary policy are used to influence financial markets in achieving national economic goals.
5. Explain the functioning of international trade in relation to a country's trade balances, exchange rates and other aspects of macroeconomic performance.

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

INTERNATIONAL ECONOMICS I

TOTAL HOURS:90

COURSE CODE: 175213

CREDITS: 4

L-T-P:

COURSE OBJECTIVE:

1. Helps to understand the basic concepts of International economics and its theories
2. To explain recently developed theorems that develop international trade and factor prices

3. To explore new theories of international trade that analyses the volume of international trade
4. To understand the impact of international trade on economic growth
5. Helps to understand the impact of economic growth and technical progress on international trade.

COURSE OUTLINE:

UNIT I

International trade--classical theory of international trade- distinguished features of international trade – refinements of the comparative costs theory- the theory the comparative costs in terms of money- in terms of two goods and many countries-multi trade model – variable costs grahams view

(15 Hours)

UNIT II

Reciprocal demand-Mills theory of reciprocal demand-international trade and factor prices. Factor intensity reversals –Stopler Samuelsson and Rybezynski theorems- the effect of change in commodity prices and real factor rewards the effect of factor endowment changes on trade

(15 Hours)

UNIT III

New theories of international trade – Karvis theory of availability- linders theory of volume of trade and demand pattern-Posners imitation gap and technological gap- vernons product cycle theory.

(15 Hours)

UNIT IV

Economic growth and international trade- Introduction effects on trade- effect of growth on terms of trade –production-trade and welfare-on a small and large country.

(15 Hours)

UNIT V

Technical progress and gains from trade-Meaning of technical progress- classification-effects of technical progress- Meaning of gains from trade and potential actual gains of trade- measurement of gains from trade factors determining gains of trade gains of trade in case of a large and small country

(15 Hours)

RECOMMENDED BOOKS

1. Bhagwati,J.(Ed)-International Trade
2. D.N. Dwivedi- International Economics: Theory And Policy

REFERENCE BOOKS:

1. M.L.Jhingan- International Economics
3. Bo Sodersten -International Economics
4. Paul Krugman- International Economics: Theory and Policy

JOURNALS

1. International Economic Journal – Taylor and Francis
2. International Economics and Economic Policy – Springer

E-LEARNING REFERENCE:

1. www.economicdiscussion.net > essays > essay-on-theories-of-international.

2. [https://saylordotorg.github.io > text international-trade-theory-and-policy](https://saylordotorg.github.io/text_international-trade-theory-and-policy)
3. [citeseerx.ist.psu.edu > viewbook](https://citeseerx.ist.psu.edu/viewbook)
4. [www.yourarticlelibrary.com > foreign-trade > contribution-of-foreign-trade-...](https://www.yourarticlelibrary.com/foreign-trade/contribution-of-foreign-trade-...)
5. [https://study.com > academy > gains-from-trade-definition-example-q](https://study.com/academy/gains-from-trade-definition-example-q)

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

ECONOMETRICS-I

TOTAL HOURS:90

COURSE CODE: 175214

CREDITS: 4

L-T-P:

COURSE OBJECTIVE:

1. To learn the basics of econometrics
2. To enable the learners to familiarize with the methodology of econometrics.

3. To understand Goodness of fit R^2 -Markov Theorem - The statistical Properties of the least square estimators with proof.
4. To familiarize with application Two variable regression model.

COURSE-OUTLINE:

UNIT- I

Econometrics - Definition –Types or Division in Econometrics – Relationship between Econometrics and Mathematical Economics, Econometrics and Statistics- Scope - Limitations of Econometrics - Methodology of Econometrics.

(15 Hours)

UNIT-II

Goals of econometrics-and methodology of Econometrics- Meaning and steps-Theory hypothesis-model specification-estimate of parameters- statistical inference and forecasting-policy making – properties of econometrics model-limitations

(15 Hours)

UNIT-III

Simple linear regression function-meaning of regression-population – regression function- stochastic specifications of PRF – significance- sample regression function- stochastic specification of SPF

(20 Hours)

UNIT-IV

Method of ordinary least-squares (OLS) – meaning and assumptions of OLS – derivations of normal equation and least square estimators- mean variance and co-variance of parameter

(20 Hours)

UNIT-V

Gauss Markov theorem-Theorem- properties-linearity- unbiasedness- minimum variance of parameters and BLUE- Goodness of fit- R^2 - coefficient of determination of and adjusted R^2

(20 Hours)

RECOMMENDED BOOKS:

1. Damodar N. Gujarathi, Essentials of Econometrics, McGraw Hill.
2. Damodar N. Gujarathi, Basic Econometrics, McGraw Hill.

REFERENCE BOOKS

- 1.Damodar N. Gujarathi, Econometrics by Example, Palgrave Publications.

Maddalla G.S., Econometrics, McGraw Hill.

2. Dominick Salvatore and Derrick Reagle, Statistics and Econometrics, Tata McGraw Hill (Schaum's Series).

JOURNALS:

1. The Econometrics Journal | Oxford Academic - Oxford Journals
2. Journal of Econometric Methods - De Gruyter

E-LEARNING RESOURCES:

1. <https://www.economicsnetwork.ac.uk> › teaching › Mathematical Economics
2. <https://towardsdatascience.com> › econometrics-behind-simple-linear-regression.
3. <https://www.statisticshowto.datasciencecentral.com> › probability-and-statistics
4. <https://www.xlstat.com> › solutions › features › ordinary-least-squares
5. <https://opentextbc.ca> › introductorybusinessstatistics › regression-basics

COURSE OUTCOME:

1. Enables to understand the basic concepts and significance of econometrics.
2. Gives an insight into understanding the methodology of econometrics.
3. Makes it possible to comprehend Goodness of fit R^2 -Markov Theorem –
4. Examine the statistical Properties of the least square estimators with proof.
5. Helps to explore the two variables regression analysis Population regression function (PRF)- Stochastic specification of SRF

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

FINANCIAL ECONOMICS

TOTAL HOURS: 75

COURSE CODE: 175215

CREDITS: 4

L-T-P:

COURSE OBJECTIVE:

1. To give an in-depth knowledge of the structure of Indian Financial system

2. To give an overall view on various financial intermediaries, financial instruments of money market and securities market and also on regulating machineries.
3. To learn various features of Indian capital market
4. To give an idea on the regulatory Government owned regulatory bodies
5. To study the role of financial system in the economic development of the country

COURSE OUTLINE:

UNIT I

Financial system-Meaning-Importance of financial system - Components of financial System

(13Hours)

UNIT II

Financial market: - Money market – Definition - need for money market - features of Money market - money market instruments - evolution of money market in India (a Brief View)

(15Hours)

UNIT III

Capital market:- Primary market - Definition - kinds of issues - General Conditions governing issues of shares in primary market - (a brief view)- Intermediaries involved in primary market.

(16Hours)

Unit IV

Secondary market: - Definition - securities dealt in secondary market - Listing of Securities –Meaning – Objectives - classification of listed securities - benefits of listing to Companies and investors - stock brokers - types of stock brokers in stock exchanges-

(15 Hours)

UNIT V

NSE-OTCEI - Insider trading - Online trading system-meaning – SEBI - objectives - administration and activities of SEBI – SEBI regulations: SEBI and primary market – SEBI and secondary market.

(16Hours)

RECOMMENDED BOOKS:

1. Financial market-Institutions and services ,Dr.N.K.Guptha&Monika –Ane Book PVT Ltd –Delhi
2. Financial Markets and financial services in India,Benson Kunjukunju &S.Mohanan-New century Publications-Delhi

REFERENCE BOOKS:

1. Indian Financial system, H.R. Modi Raja Financial services in India-Rajesh Kothari

JOURNALS:

1. Indian Journal of Finance (ISSN 0973 – 8711)
2. Finance India, ISSN 0970 3772

E LEARNING RESOURCES:

1. <https://www.rbi.org.in>
2. <https://learning.equitymaster.com>
3. [www.capital market.com](http://www.capitalmarket.com)
4. [http://www.trade brains.in](http://www.tradebrains.in)
5. <https://www.sebi.govt.in>

COURSE OUTCOME:

1. Analyse investment decisions with minimum market risk.
2. Identify and describe the risks of managing portfolios of fixed income securities
3. Understand how securities are priced and affected by the institutional arrangements in securities markets.
4. Get in depth knowledge on the measures taken by Government to regulate the securities market in the country
5. Gain knowledge about the importance of financial system for an economy

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	2	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	2.8	2.8

ENVIRONMENTAL ECONOMICS

TOTAL HOURS:75

COURSE CODE: 175216

CREDITS: 3

L-T-P:

COURSE OBJECTIVES:

1. The course aims to understand the application of economic analysis to the management of environmental and natural resources.
2. To equip the student to understand the concepts of Public Good, Externality and Market Failure.
3. To teach the different Energy resources and evaluate the position of the country.
4. To explain the concept of Pollution and its impact on the economy.
5. To make the student aware of the laws pertaining to Environment.

COURSE OUTLINE:

Unit I

Environmental Economics- Meaning-Scope- Relationship between the Environment and Economic System-Natural Resources-Classification-Renewable and Non-Renewable Resources.

(15 Hours)

Unit II

Environmental Quality as the Public Good- Tragedy of the Commons- Characteristics of Common Property Resource- Environmental Quality as a Public Good- Demand as the Sum of Willingness to Pay –Allocation of Public Goods.

(15 Hours)

Unit III

Energy Economics- Sources of Energy- Classification- Renewable and Non-Renewable Sources of Energy-Pattern of Energy Consumption- Energy Scenario in India

(15 Hours)

Unit IV

Pollution Control- Optimum Level of Pollution Control- Pollution Control Model- Optimum Effluent Charges-Pollution Permits

(15 Hours)

Unit V

India's Environmental Policy- Efforts of Government to Prevent Pollution- The Water Prevention and Control of Pollution Act- The Environment Protection Act.

(15 Hours)

RECOMMENDED BOOKS

- 1.Sankar U, Environmental Economics.(2001) Oxford University Press, India

2.Katar Singh and Anil Shishodia,(2007) Environmental Economics Theory and Applications, Sage Text

3.Prof.T.Eugine ,Environmental Economics ,Vrinda Publications 2016

4.Rabindranath Bhattacharya (2002) Environmental Economics –An India Perspective, Oxford University Press,India

REFERENCE BOOKS:

1. Charles Kolstad, Intermediate Environmental Economics, Oxford University Press, 2nd edition, 2010.

2. Robert N. Stavins (ed.), Economics of the Environment: Selected Readings, W.W.Norton, 5th edition, 2005.

3. Roger Perman, Yue Ma, James McGilvray and Michael Common, Natural Resource and Environmental Economics, Pearson Education/Addison Wesley, 3rd edition, 2003.

4. Maureen L. Cropper and Wallace E. Oates, 1992, “Environmental Economics: A Survey”, Journal of Economic Literature, Volume 30, pp. 675-740.

JOURNALS:

1. Journal of Environmental Economics and Management

2. Land Economics

3. Environment and Resource Economics

COURSE OUTCOME:

1. Apply economic analysis to the management of environmental and natural resources.
2. Understand the concept of Common Property Resources, Public Good and Externality
3. To examine and understand the energy resources in the country
4. To be aware of Pollution problems and its impact on the country
5. To be aware of the legal aspects of Environment issues.

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	2	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	2.8	2.8

EXTRA DISCIPLINARY ELECTIVE SUBJECT

PRINCIPLES OF MANAGEMENT

TOTAL HOURS: 30

COURSE CODE: 175217

CREDITS: 3

L-T-P:

COURSE OBJECTIVES:

- 1.To understand the evolution, trend and challenges of management thought**
- 2. To learn the strategies of planning and the process of decision making**
- 3. To explore the variations in the organizational structure and delegation of authority**
- 4. To explain various theories of motivation and leadership; the need for effective communication**
- 5. To explain the techniques of budget control**

COURSE OUTLINE:

UNIT – I Definition - Management - Role of managers - Evolution of Management thought - Organization and the environmental factors – Trends and Challenges of Management

(5 Hours)

UNIT-II Planning- Nature and purpose of planning - Planning process - Types of plans – Objectives - - Managing by objective (MBO) Strategies - Types of strategies - Policies - Decision Making - Types of decision - Decision Making Process - Rational Decision Making

(5 Hours)

UNIT-III Organizing - Nature and purpose of organizing - Organization structure - Formal and informal groups of organization - Line and Staff authority - Departmentation - Span of control - Centralization and Decentralization - Delegation of authority –

(10 Hours)

UNIT –IV Creativity and Innovation - Motivation and Satisfaction - Motivation Theories - Leadership Styles - Leadership theories - Communication - Barriers to effective communication - Organization Culture - Elements and types of culture - Managing cultural diversity.

(5 Hours)

UNIT –V Controlling- Process of controlling - Types of control - Budgetary and non-budgetary control Q techniques - Managing Productivity - Cost Control - Purchase Control – Maintenance Control - Quality Control - Planning operations.

(5 Hours)

RECOMMENDED BOOKS

1. Principles of Management Paperback – 2016, S Ramachandran.
2. Principles of Management, R. C. Bhatia

REFERENCE BOOKS:

1. Principles of Management, Pushpinder Singh Gill
2. Principles of Management, Tripathi

JOURNALS

1. Academy of Management Journal
2. Scholars Journal of Economics, Business and Management

E-LEARNING RESOURCES:

1. <https://www.brainkart.com> › article › Evolution-of-Management-Thought_
2. <https://study.com> › academy › lesson › what-is-management-by-objectives
3. <https://www.managementstudyhq.com> › types-of-organizational-structures
4. www.yourarticlelibrary.com › organization › organizational-culture
5. <https://www.brainkart.com> › article › Non-Budgetary-Control-Techniques_.

LEARNING OUTCOME:

1. Understand the evolution, trend and challenges of management thought
2. Enables to learn the strategies of planning and the process of decision making
3. Identify the variations in the organizational structure and delegation of authority
4. Understand various theories of motivation and leadership; the need for effective communication
5. Explain the techniques of budget control

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

**II YEAR
IV SEMESTER**

MACRO ECONOMICS-II

TOTAL HOURS:90

COURSE CODE: 175218

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. To impart knowledge on classical, Keynesian and Post Keynesian approach of money
2. To familiarize the composition of money supply and introduce the concept of high powered money which influence money supply
3. To acquaint the students about derivation of general equilibrium with IS and LM framework and the effectiveness of monetary fiscal policy
4. To convey various factors influencing inflation with the related theoretical framework
5. To enlighten the conflicting goals of Macro economic policy and various approaches coordinating the goals

COURSE OUTLINE:

UNIT -1

The classical approach- The Keynesian approach- The Post- Keynesian approaches- Patinkins approach- Baumol's approach- James Tobins approach-Gurley and Shaw approach

(15 Hours)

UNIT -2

The supply of money- Compositions of money supply- High powered money or monetary base- Determinants of money supply- Measures of money supply in India.

(15 Hours)

UNIT-3

General equilibrium model in two sector system-(a)The real market (b) The money market- ISLM model-with Government sector- IS-LM model with Labour market- Effectiveness of monetary and fiscal policies- The keynesian range- The classical range - The intermediate range.

(20 Hours)

UNIT-4

Meaning of inflation-Theories of inflation- 1.Excess demand or Demand pull inflation theories (A) classical theory (B) Excess demand analysis (C) The Inflationary gap analysis (d) Bent Hansen demand inflation theory II cost inflation or cost push inflation theories (a) Wage push (b) Markup pricing, Profit Push, Sectoral demand shift theory or Ratchet inflation- Structural theory of inflation-Phillips curve.

(20 Hours)

UNIT-5

Macro- Economic Policy- - objectives- Price stability-Maximum employment- Balance of international payments-Steady economic growth-Greater Equality in Incomes-conflict and co-ordination of objectives-(1)Price stability and Economic growth (2) Full employment and Economic growth (3) Full employment and Price stability-(a)The optimizing Approach,(b) The fixed Target Approach(4)Economic growth, Price stability and Exchange stability.

(20 Hours)

RECOMMEDE BOOKS:

1. N.Gregory Mankiw(1999)Macro Economics, Worth Publishers, New York
2. Roger.E.A.Farmer (2002)Macro Economics, Thompson Asia Pte Ltd, Singapore

REFERENCE BOOKS:

1. Ackley,Gardner. Macro Economic Analysis:Theory and Policy Macmillan Publishers ,New York
2. Shapiro, Edward, Macro Economic Analysis, Golgotia Publications, New Delhi

JOURNALS

4. Journal of Macroeconomics, Editors
5. South Asian Journal of Macro Economics and Public Finance
6. Macroeconomics and Finance in Emerging Market Economies

E - LEARNING RESOURCES

- www.preservearticles.com › notes › brief-notes-on-four-broad-approaches
- www.economicdiscussion.net › money › money-supply-meaning-and-measures
- <https://www.tutorsonnet.com> › is-and-lm-functions-homework-help
- <https://www.semanticscholar.org> › paper › Macroeconomic-Theories-of-Inflation
- <https://www.economicsonline.co.uk> › Managing the economy › Macro-economic policy

COURSE OUTCOME:

1. Gain knowledge on classical, Keynesian and Post Keynesian approach of money
2. Examine the composition of money supply and introduce the concept of high powered money which influence money supply
3. Understand the method of derivation of general equilibrium with IS and LM framework and examine the effectiveness of monetary fiscal policy
4. Acquire knowledge about various factors influencing inflation with the related theoretical framework
5. Observe conflicting goals of Macroeconomic policy and various approaches coordinating the goals

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

INTERNATIONAL ECONOMICS- II

TOTAL HOURS:90

COURSE CODE: 175219

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. To understand the meaning of balance of payments and equilibrium in BOP.
2. To know the functioning of international financial institutions and its role.
- 3.Helps to understand the impact of debt on international trade.
- 4.To understand working of WTO.
- 5.To comprehend the significant role of SAARC countries in the arena of international trade.

COURSE OUTLINE:

UNIT I

Balance of payment- meaning- components disequilibrium-types measures to correct disequilibrium-Adjustment mechanisms under flexible exchange rate –elasticity approach-absorption approach monetary approach.

(15 Hours)

UNIT II

World Bank Group- International Development Association International Finance corporation-multinational investment guarantee agency

(15 Hours)

UNIT III

International Liquidity- International Debt Problem- Meaning –problems –measures to solve it IMF and international liquidity Role of IMF in increasing international liquidity –Meaning of international debt –problems and measures to solve the international debt crisis.

(20 Hours)

UNIT IV

WTO –Difference between WTO and GATT- structure – objectives –functions WTO agreements –working of WTO- DOHA round TRIMS and TRIPS

(20 Hours)

UNIT V

Meaning of SARRC-principles – objectives-general provisions co-operation with other organizations suggestions to increase the cooperation

(20 Hours)

RECOMMENDED BOOKS:

1. Bhagwati,J.(Ed)-International Trade
2. D.N. Dwivedi- International Economics: Theory And Policy

REFERENCE BOOKS:

1. M.L.Jhingan- International Economics
3. Bo Sodersten -International Economics
4. Paul Krugman- International Economics: Theory and Policy

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

ECONOMETRICS-II

TOTAL HOURS: 90

COURSE CODE: 175220

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. To Give an understanding of Multiple Regression. Model
2. To Help the learners to familiarize with techniques of ANCOVA. Model-

3. To Help to learn the Multicollinearity.
4. To get an in depth understanding of Heteroscedasticity–,
5. To explore the methods of Auto–Correlation–

COURSE OUTLINE:

UNIT- I

Multi-linear-Regression Model -Meaning -Assumptions –statistical properties of multiple regression model – linearity -unbiasedness and sampling variance-measures of goodness of fit of multiple linear regression model

(15 Hours)

UNIT-II

Multicollinearity- meaning-nature- perfect and imperfect Multicollinearity consequences of Multicollinearity-and detection of Multicollinearity- remedial measures

(15 Hours)

UNIT-III

(20 Hours)

Heteroscedasticity–meaning – nature- Consequences of heteroscedasticity, Detection of Heteroscedasticity - Remedial Measures,

UNIT-IV

Auto correlation-meaning -reason for auto correlation- consequences of auto correlation-detection of auto correlation and remedial measures

(20 Hours)

UNIT V

Functional forms- Regression through the origin- double log model-measurement of elasticity model-semilog model- measurement of growth model

(20 Hours)

RECOMMENDED BOOKS:

1. Damodar N. Gujarathi, Essentials of Econometrics, McGraw Hill.
2. Damodar N. Gujarathi, Basic Econometrics, McGraw Hill.

REFERENCE BOOKS:

1. Damodar N. Gujarathi, Econometrics by Example, Palgrave Publications.
2. Maddala G.S., Econometrics, McGraw Hill.
3. Dominick Salvatore and Derrick Reagle, Statistics and Econometrics, Tata McGraw Hill (Schaum's Series).

JOURNALS:

1. **Journal of Econometrics - Elsevier**
2. **Journal of Econometrics - SCImago**

E-LEARNING RESOURCES:

1. <https://www.statisticssolutions.com> › what-is-multiple-linear-regression
2. <https://stattrek.com> › multiple-regression › dummy-variables
3. <https://www.statisticssolutions.com> › multicollinearity
4. <https://www.statisticshowto.datasciencecentral.com> › heteroscedasticity
5. <https://www.displayr.com> › autocorrelation

LEARNING OUTCOME:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

RESEARCH METHODOLOGY

TOTAL HOURS: 75

COURSE CODE: 175221

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. To explore the meaning of research and methods of selecting a research problem
2. To classify the methods of data collection and discuss their relative merits and demerits
3. To understand the techniques of data processing and its presentations
4. To acquire knowledge about testing of hypothesis
5. To comprehend the research design and format of research report

COURSE OUTLINE:

Unit I

Research – Definition- Characteristics- Objectives- Importance- Research Problem Identification and Selection of Research Problem.

(15 Hours)

Unit II

Methods of Data Collection- Sources of Primary And Secondary Data-Sampling – Sample Design –Types -Observation Method- Interview- Questionnaires- Merits and Demerits- Limitations of Secondary Data- Use of Computers In Research.

(15 Hours)

Unit III

Processing of Data- Editing-Coding-Classification- Tabulation-Types- Diagrammatic Presentation- Types and Uses.

(15 Hours)

Unit IV

Hypothesis- Characters- Advantages- Testing of Hypothesis- Procedure- Errors.

(15 Hours)

Unit V

Research Design- Definition- Classification- Features- Types- Uses- Research Report—Format of Research Report- Format- Bibliography.

(15 Hours)

RECOMMENDED BOOKS:

1. Research Methodology ,Vijay Upagade, S.Chand
2. Research Methods-Tips and Techniques, G.Vijayalakshmi and C.Sivaprakasam, MJP Publishers.

REFERENCE BOOKS:

1. A text on Research Methodology in Management, C.Murthy, Vrindha Publishers.

Research Methodology Nagarajan and Kaliyaperumal

JOURNALS:

3. **International Journal of Social Research Methodology**
4. **Journal of Mixed Methods Research: SAGE Journals**

E-LEARNING RESOURCES

6. <https://www.qualtrics.com> › blog › research-problem
7. <https://research-methodology.net> › research-methods › data-collection
8. <https://planningtank.com> › computer-applications › data-processing
9. <https://socialresearchmethods.net> › hypothes
10. www.studylecturenotes.com › social-research-methodology › types-of-research

COURSE OUTCOME:

6. Gain knowledge about criteria of selecting research problem
7. Understand the methods of collecting data according to the research requirements
8. Acquaint knowledge about the methods of data processing and represent them in presentable form with the help of computers
9. Learn the significance of hypothesis, its characteristics and methodology of testing it
10. Enables to understand the format of a research report and its elements

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

LABOUR ECONOMICS

TOTAL HOURS: 75

COURSE CODE: 175222

CREDITS: 3

L-T-P:

COURSE OBJECTIVES:

1. To elaborate the subject matter of labour economics and aspects of migration
2. To explain the problems and other issues of labour in unorganized sector

3. To explore the issues of absenteeism and difficulties in measuring it
4. To understand the strength and weakness of trade unions
5. To analyse the causes and methods of settling labour disputes

COURSE OUTLINE:

Unit – I	Labour and labour economics – Meaning – Factors – which give rise labour problems – Characteristics of Indian labour - migration – Meaning – causes of Migration – Effects of Migration.	(15 Hours)
Unit – II	Labour in organized sector and unorganised sector – problems of unorganized labour - wages - cause of difference in wages – methods of wage payment - piece wages - time wages - Living, fair, minimum and Nominal wages - wage policy in India	15 Hours)
Unit – III	Absenteeism - definition - effects of Absenteeism – causes Labour Turn over - measurement - difficulties in measuring – effects of labour turn over - causes of labour turn over	(15 Hours)
Unit – IV	Trade unionism in India - Trade union definition - objective - structure of Trade union in India - Role and function of Trade Union -Advantages and disadvantages of trade union	(15 Hours)
Unit –V	Industrial disputes - strike - lock out - causes for industrial disputes - economic - non economic causes - effect of Industrial disputes – methods of the settlement of Industrial disputes – negotiation – concillation and mediation – Arbitration	(15 Hours)

RECOMMENDED BOOKS:

1. Labour Restructuring in India: A Critique of the New Economic Policies, - Hajela, P.D. (1998), Commonwealth Publisher, New Delhi.
2. Labour, employment and industrial Relations in India, Papola, T.S., P.P. Ghosh and A.N. Sharma (Eds.) (1993), B.R. Publishing Corporation, New Delhi.

REFERENCE BOOKS:

1. Labour Problems and Social Welfare in India, Memoria, C.B. (1966), Kitab Mahal, Allahbad.

2. Economics of Labour and Industrial Relations, Bhagoliwal T.N.,

JOURNALS

1. Labour Economics - Journal - Elsevier

2. Indian Journal of Labour Economics - Springer

E-LEARNING RESOURCES:

1. www.studyingeconomics.ac.uk › module-options › labour-economics

2. <https://studymoose.com> › unorganised-labour-in-india-

3. <https://www.marketing91.com> › Management articles

4. www.yourarticlelibrary.com › trade-unions › trade-union-its-meaning

5. www.economicsdiscussion.net › industrial-disputes

LEARNING OUTCOME:

1. Enable to understand subject matter of labour economics and causes of Migration

2. Enable to describe the problems of labourers in unorganized sectors

3. Comprehend the causes for absenteeism and difficulties in measuring in an organization

4. Analyse the evolution of trade unions in India and their potentials and problems

5. Describe the causes and methods of settling labour disputes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

**QUAID-E-MILLATH GOVERNMENT COLLEGE FOR
WOMEN (AUTONOMOUS), CHENNAI – 02**

PG & RESEARCH DEPARTMENT OF ECONOMICS

SYLLABUS - UG



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

OFFERED FROM THE ACADEMIC YEAR 2017-18

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Programme Specific Outcomes

Programme Profile

Rubrics for CA Evaluation

Evaluation Pattern for End Semester

Course Profile Semester I

Course Profile Semester II

Course Profile Semester III

Course Profile Semester IV

Course Profile Semester V

Course Profile Semester VI

**QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS), CHENNAI – 600 002.**

Undergraduate Courses

Choice Based Credit System

Quaid-E-Millath Government College for Women (Autonomous), offers the Semester System of Education with credits for UG courses. Credit simply means the weightage given to

what is taught and what is learnt. It is normally related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures / tutorials / laboratory work / seminar / project work / practical training / viva voce etc to facilitate effective teaching and learning and the credits are assigned accordingly, depending on the content and the specialization.

The minimum credit requirement for a three – year UG course shall be 140 inclusive of Part IV and Part V.

REGULATIONS

1. Duration

- a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semester, the second academic year, the third and fourth semesters and the third academic year, the fifth and sixth semester.
- b. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year.

2. Course of Study

The course of study for bachelor Degree Courses shall comprise of the following:

Foundation Courses: The courses shall comprise the study of:

- i) **Part - I** Tamil - 6 Credits for B.A. and B.Sc.; 4 Credits for B.Com.
- ii) **Part – II** English – 6 Credits for B.A and B.Sc.; 4 Credits for B.Com.

Part III:

- a. Core Subjects (B.A.-79 Credits; B.Sc. - 79 Credits and 91 Credits– B.Com.)
- b. Allied Subjects (20 Credits for B.A., B.Sc., and B.Com.)

Part IV:

- c. Soft Skill (4 Papers) (8 Credits)
- d. Non-Major Elective (2 Papers) (4 Credits)
- e. Environmental Studies (2 Credits)
- f. Value Education (2 Credits)

Part V:

- g. Extension Activities (1 Credit)

3. Compulsory Extension Service

A candidate shall be awarded a maximum of one credit for Compulsory Extension Service. All students shall have to enroll for NSS/NCC/Sports and Games/Rotary/Youth Red Cross or any other service organization in the College and shall have to put in compulsory attendance of 40 hours, which shall be duly certified. If a student lacks 40 hours attendance in the First year, she shall have to compensate the same during the subsequent years.

Distribution of Marks for Continuous Assessment

Part I, Part II and Part III

Test			Best 2 out of 3	Assignment	Seminar / Creative Presentation	Model Exam	Attendance	Total	Reduced to
20	20	20	40	10	15	25	10	100	25

Test (Best two out of three) : 40 Marks

Assignment/ Seminar / Creative Presentation : 25 Marks

Model Examination : 25 Marks

Attendance : 10 Marks

Total (Internal) : 100 Marks reduced to 25

Calculation of Attendance Marks

90 – 100%	-	10 Marks
80 – 89%	-	9 Marks
75 – 79%	-	8 Marks
65 – 74%	-	7 Marks
55 – 64%	-	5 Marks
Below 55%	-	0 – Not Eligible

C.A QUESTION PAPER PATTERN UG

Knowledge Level	Section	Word limit	Marks	Total
K1	A 10X2	50	20	75
K1, K2	B 5/8X5	200	25	
K2, K3	C 3/5 X10	500	30	

Part IV:

Semester End Examination : 60 Marks

Continuous Internal Assessment : 40 Marks

Distribution of CIA Marks:

Seminar / Presentation	Assignment / Term Paper	Written / Oral Test	Total
20	10	10	40

End Semester Examination : Theory Paper – 60 Marks – Duration 2.30 hours.

Question Paper Pattern : 10 x 6 Marks = 60 Marks (10 out of 15)

The Following Method Will Be adopted for allotting credits for UG/PG courses offered in the affiliated colleges as per TANSCH by this University

UG COURSES

The total credits allotted for UG COURSES is minimum of 140 credits

Sl.no	paper	No.papers	credits	Total credits
1	Part 1 language	4	3	12
2	Part II English	4	3	12
3	Core subjects	30 -15	4-5	60
	Allied Subjects	4	5	20
	Project/electives with 3 courses	Project (6)	3	15
4.	Part 4 Non major elective /basic Tamil/Add.Tamil	2	2	4
	Part II	4	2	12
	Environmental studies	4	2	12
	Value Education	1	2	2
5	Part V Extention activities		1	1
	TOTAL			140

CHOICE BASED CREDIT SYSTEM
B.A. DEGREE COURSE

Semester - I				Semester - II				Semester - III				Semester - IV				Semester - V				Semester - VI			
Sub	Pap er	Cr	Hrs	Sub	Pap er	Cr	Hrs	Sub	Pa per	Cr	Hrs	Sub	Pap er	Cr	H rs	Sub	Pap er	Cr	H rs	Su b	Pa per	Cr	Hrs
Lang	1	3	4+2	Lang	1	3	4+2	Lang	1	3	6	Lang	1	3	6	Maj or	4	4 eac h	24	M aj or	3	5+ 5+ 4	18
Eng	1	3	4	Eng	1	3	4	Eng	1	3	6	Eng	1	3	6	Elect ive	1	5	5	El ect iv e	2	5 eac h	11
Major	2	5+ 5	10	Major	2	4+4	10	Maj or	2	4+4	9	Maj or	2	4+4	10	VE	1	-	1	V E	1	2	1
Allied	1	5	6	Allied	1	5	6	Allie d	1	5	5	Allie d	1	5	5								
NME I	1	2	2	NME II	1	2	2	Soft Skill -III	1	2	2	Soft Skill -IV	1	2	2								
Soft Skill-I	1	2	2	Soft Skill- II	1	2	2					EVS	1	2	1								
								EVS	1		2	EXT	-	1	-								
Total	7	25	30	Total	7	23	30	Tota l	7	21	30	Tota l	7	24	30	Tota l	6	21	30	To tal	6	26	30

NME: Non Major Elective - to be handled by Arts Departments (Tamil, Economics, History and Commerce)

Soft Skill I & II - to be handled by English Department (English)

Soft Skill III & IV - to be handled by respective Departments

EXT: Extension Activities - to be handled by respective Departments

EVS : Environmental Studies - to be handled by respective departments - Examination at the end of IV Semester

VE : Value Education - to be handled by respective departments - Examination at the end of VI Semester

PROGRAMME OUTCOME

UNDER GRADUATE ARTS

On Completion of the Programme, the learner is able to

- 1. Apply human values**
- 2. Identify the subject goals**
- 3. Formulate creative skills**
- 4. Acquire communication skills and subject knowledge**
- 5. Analyse the responsibilities**

Programme Specific Outcomes (Pos)

- 1. Apply the basic economic concepts. Variables and develop knowledge about Economic Theories in Micro and Macro Environment**
- 2. Identify and develop the student's ability to analyse historical and current events from Economic Perspective**
- 3. Provide opportunity to students to focus on applied policy issues in Economics**
- 4. Design quantitative knowledge-oriented courses to facilitate research in Economics**
- 5. Acquire knowledge to pursue further knowledge for higher studies and develop employability skills**

PROGRAMME PROFILE
B.A. ECONOMICS
FRAMEWORK OF THE SYLLABUS WITH CHOICE BASED CREDIT
SYSTEM FOR THE STUDENTS ADMITTED FROM 2017-18

SE M	Part	PAP ER	Course Code	TITLE OF THE PAPER	CRE DIT	LECTU RE HOURS	Tota l Hou rs	C A	SE M	TOTA L MAR KS
I	LANGUAGE	I	173301	TAMIL PAPER I	3	6	90	25	75	100
		II	173801	ENGLISH PAPER I	3	4	60	25	75	100
	CORE	III	171301	MICRO ECONOMICS I	4	5	75	25	75	100
		IV	171302	STATISTICS FOR ECONOMISTS I	4	5	75	25	75	100
	ALLIED	V	171391	MARKETING I	5	6	90	25	75	100
	NME I			NON-MAJOR ELECTIVE- HUMAN RESOURCE MANAGEMENT	2	2	30	40	60	100
	SOFT SKILL I		179001	ESSENTIALS OF LANGUAGE AND COMMUNICATIO N	3	2	45	40	60	100
II	LANGUAGE	VI	173302	TAMIL PAPER II	3	6	60	25	75	100
		VII	173802	ENGLISH PAPER II	3	4	60	25	75	100
	CORE	VIII	171303	MICRO ECONOMICS II	4	5	75	25	75	100
		IX	171304	STATISTICS FOR ECONOMISTS II	4	5	75	25	75	100
	ALLIED	X	171392	MARKETING II	5	6	90	25	75	100
	NME II			NON-MAJOR ELECTIVE- BASICS OF ECONOMICS	2	2	30	40	60	100
	SOFT SKILL II		179002	ESSENTIALS OF SPOKEN AND PRESENTATION SKILLS	3	2	30	40	60	100
III	LANGUAGE	XI	173303	TAMIL PAPER III	3	6	90	25	75	100
		XII	173803	ENGLISH PAPER III	3	6	90	25	75	100
	CORE	XIII	171305	INDIAN ECONOMY I	4	5	75	25	75	100
		XIV	171306	MONETARY ECONOMICS I	4	4	60	25	75	100
	ALLIED	XV	171393	MATHEMATICAL ECONOMICS	5	5	75	25	75	100
	SOFT SKILL III		179003	PERSONALITY ENRICHMENT	3	2	30	40	60	100
	EVS		174001	ENVIRONMENTA L STUDIES		2	30	40	60	100

IV	LANGUAGE	XVI	173304	TAMIL PAPER IV	3	6	90	25	75	100
		XVI I	172804	ENGLISH PAPER IV	3	6	90	25	75	100
	CORE	XVI II	171307	INDIAN ECONOMY II	4	5	75	25	75	100
		XIX	171308	MONETARY ECONOMICS II	4	4	60	25	75	100
	ALLIED	XX	171394	ECONOMETRICS	5	5	75	25	75	100
	SOFT SKILL IV		179004 A	FUNDAMENTALS OF INFORMATION TECHNOLOGY	3	2	30	40	60	100
	EVS		174002	ENVIRONMENTA L STUDIES	2	2	30	40	60	100
	EXT			EXTENSION ACTIVITIES	1					
V	CORE	XXI	171309	MACRO ECONOMICS I	4	6	90	25	75	100
		XXI I	171310	PUBLIC FINANCE I	4	6	90	25	75	100
		XXI II	171311	INTERNATIONAL ECONOMICS I	4	6	90	25	75	100
		XXI V	171312	MANAGERIAL ECONOMICS I	4	6	90	25	75	100
	ELECTIVE	XXV	171313	ECONOMIC THOUGHT	5	5	75	25	75	100
	VE			VALUE EDUCATION		1	15	40	60	100
VI	CORE	XXV I	171314	MACRO ECONOMICS II	4	6	90	25	75	100
		XXV II	171315	PUBLIC FINANCE II	4	6	90	25	75	100
		XXV III	171316	INTERNATIONAL ECONOMICS II	4	6	90	25	75	100
		XXI X	171317	MANAGERIAL ECONOMICS II	5	6	90	25	75	100
	ELECTIVE	XXX	171318	HISTORY OF ECONOMIC THOUGHT	5	5	75	25	75	100
	VE		174003	VALUE EDUCATION	2	1	15	40	60	100
	TOTAL				140					

RUBRICS FOR CONTINUOUS ASSESSMENT

S.No.	Component	Criteria
1	Assignment	Content Originality Presentation Schematic Representation Diagram Bibliography
2	Seminar	Organisation Subject Knowledge Visual Aids Confidence level Presentation Communication Language
3	Field Visit	Participation Preparation Attitude Leadership
4	Participation	Answering Questions Clearing Doubts Participating in Group Discussions Regular Attendance

**END SEMESTER EVALUATION PATTERN – U.G.,
THEORY PAPERS**

SEMESTER I/II/III/IV/V/VI

PART I/II/III

SINGLE VALUATION BY EXTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARK : 30

PART IV

SINGLE VALUATION BY INTERNAL EXAMINER

WRITTEN TEST

MAXIMUM MARKS : 60

PASSING MARK : 24

PRACTICAL PAPERS

PART III

SEMESTER I/II/III/IV/V/VI

VALUATION BY EXTERNAL EXAMINER AND INTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARK : 30

SEMESTER I

MICRO ECONOMICS I

TOTAL HOURS: 75

COURSE CODE: 171301

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. To help the students to understand the basic concepts of micro economics
2. To help the learners to have idea of concepts of demand and supply.
3. To understand and analyse the consumer behaviour pattern

COURSE OUTLINE:

- UNIT I** **Economics Definitions of Economics – Growth definition-positive and normative economics-Micro and Macro Economics - similarities and dissimilarities- importance-interdependence of micro with macro**
(5 Hours)
- UNIT II** **Consumer behavior-Marginal utility analysis (cardinal)- Introduction – Definition of utility - utility and satisfaction –concept of total ,average and marginal utility-The law Diminishing Marginal Utility-Definition - Assumptions –illustration of the law-exception-importance of the law - limitations -Law of Equi-marginal utility- Definition assumptions – illustration of the law –exception- importance of the law - limitations**
(15 Hours)
- UNIT III** **Demand- Law of demand -Definition ,features- factors affecting Demand- Demand schedules –Demand curves –individual demand , market demand -difference between change in demand and amount demanded-illustration of the law - reasons for downward sloping demand curve- explanation- exceptions-importance of the law-Elasticity of demand -Definition - types - explanation - methods of measuring elasticity - importance – factors**

affecting elasticity-income ,Price ,Income and cross elasticity- Law of supply -Definition

(15 Hours)

UNIT IV Indifference curves - Definition- scale of preferences-assumptions-indifference schedule- indifference curve – indifference map-price line - diminishing marginal rate of substitution-consumers equilibrium-properties-limitations- Uses

(20 Hours)

UNIT V Production –production function - Isoquant and isocost - Definition - Law of variable proportions-Definition–illustration of the law - Law of returns to scale-Definition-illustration of the law

(20 Hours)

RECOMMENDED TEXT BOOKS:

1. Micro Economics- R. Cauvery, Dr.U.K.SudhaNayak , Dr.M.Girija, Dr.R.Meenakshi S. Chand Publishing
2. Micro Economics –Sankaran, *Margham Publications*

REFERENCE BOOKS:

1. A Text Book of Economic Theory - Alfred William Stonier, Hague Stonier, Longman Higher Education; 5th Revised edition edition
2. Micro Economics – K.K. Dewett, S. Chand Publishing

JOURNALS:

1. American Economic Journal: Microeconomics
2. Studies in Microeconomics

E-LEARNING RESOURCES:

1. <https://study.com/academy/lesson/what-is-microeconomics-definition-topics.html>
2. www.apstudynotes.org/microeconomics/outlines
3. <https://repository.up.ac.za/bitstream/handle>
4. <https://www.thoughtco.com/beginners-guide-to-price-elasticity-of-demand>
5. <http://www.economicdiscussion.net/differences-between/difference-returns-to-scale-and-economies-of-scale-economics>

COURSE OUTCOME:

1. To equip the students with micro economic theories with graphic illustrations.
2. To develop the skills of analysis of consumer behaviour with theoretical background
3. Understand the basic market variables that influence consumers and producers
4. Understand the ordinal measurement of consumer behaviour towards equilibrium

5. Understand the theoretical and practical background of Production

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3
CO2	3	3	3	3	3
CO3	3	3	2	2	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.6	2.8	2.8

STATISTICS FOR ECONOMISTS – I

TOTAL HOURS:75

COURSE CODE:171302

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. Provide basic knowledge of the application of statistics
2. Develop the ability to analyse and interpret data to provide meaningful information
3. Develop an ability to apply modern quantitative tools to data analysis in research

COURSE OUTLINE

**UNIT -I Introduction: Definition – Functions – Importance – Limitations.
Collection of Data: Primary and Secondary data.**

(12 Hours)

**UNIT- II Sampling: Definition of sampling - types -techniques of sampling-
importance and limitations of sampling**

(15 Hours)

**UNIT -III Classification and Tabulation –Types of classification -features of Table -
Diagrammatic Representation of data: Bar diagram, Multiple Bar
diagram, Percentage Bar diagram, Pie diagram, Histogram, Frequency
Polygon, Frequency Curve and Lorenz curve.**

(15 Hours)

**UNIT -IV Measures of central tendency: Arithmetic Mean, Median-Quartile, Decile
and percentile – Mode**

(18 Hours)

**UNIT -V Measures of Dispersion: range, Quartile Deviation, Mean Deviation,
Standard deviation – Co – efficient of variation**

(15 Hours)

RECOMMENDED TEXT BOOKS

1. S..P.Gupta, Elementary Statistics, Sultan Chand And Sons, New Delhi, 2007
2. R.S.N. Pillai and V. Bagavathi , Practical Statistics, S. Chand Limited, 2003

REFERENCE BOOKS:

1. John E. Freund, Mathematical Statistics, Prentice Hall, 1992
2. An Introduction to Mathematical Statistics and its Applications, Richard J. Larsen and Morris L. Marx Prentice Hall, 2011.

JOURNALS:

- 1. Journal of Applied Statistics**
- 2. Journal of Statistics Education**
- 3. Journal of Business & Economic Statistics**

E-LEARNING RESOURCES:

- <https://statisticsbyjim.com>
- www.yourarticlelibrary.com › education
- <https://www.emathzone.com> › tutorials
- <https://www.assignmenthelp.net>
- www.economicsdiscussion.net › statistics

COURSE OUTCOME

- 1. Produce appropriate graphical and numerical descriptive statistics for different types of data.**
- 2. Recognise some common types of sampling design, such as simple random sampling, stratified sampling and multistage designs**
- 3. Apply probability rules and concepts relating to discrete and continuous random variables to answer questions within a business context.**
- 4. Conduct and interpret a variety of hypothesis tests to aid decision making in a business context.**
- 5. Use simple/multiple regression models to analyse the underlying relationships between the variables through hypothesis testing.**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	2	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	2.8	3	3	3

MARKETING-I

TOTAL HOURS:90

COURSE CODE: 171391

CREDITS: 5

L-T-P:

COURSE OBJECTIVES

- 1. To introduce the marketing concept and to identify, understand and satisfy the needs of customers and markets.**
- 2. To analyse companies and competitors and to introduce marketing strategy to increase awareness of the strategic and tactical decisions behind today's top performing brands**
- 3. Understand fundamental marketing concepts, theories and principles in areas of marketing policy**

COURSE OUTLINE

UNIT -I Market-Definition-Classification of Markets- Features of Marketing- Modern Marketing Concept- Market Segment-Marketing Mix.
(15 Hours)

UNIT-II Buying- Kinds of Buyers-Elements of Buyers - Methods of Buying - Problems of Buying - Selling - Elements-Kinds - Assembling-Meaning - Advantages -Problems. Storage – Advantage – Warehouse – Classification – importance
(20 Hours)

UNIT-III Standardization -Types of Standards- Grading, Benefits of Grading- Labelling- Types - Packaging- Kinds- Materials used for Packaging- Branding- Types of Brands- Advantages.
(20 Hours)

UNIT-IV Price-Definition- Objectives-Factors affecting Pricing Decisions- Kinds of Pricing.
(20 Hours)

UNIT-V Market Information - Meaning-Importance - Market Research – Objectives - Procedures.
(15 Hours)

RECOMMENDED BOOKS:

1. Marketing- Dr. N. Rajan Nair
2. Modern Marketing- R.S.N. Pillai & Bhagawathi

REFERENCES BOOKS:

1. Marketing - Philip Kotler
2. Modern Marketing – Kathiresan & Radha

JOURNALS:

- Journal of Marketing Research: SAGE Journals
- Indian Journal of Marketing

E-LEARNING RESOURCES

1. <https://www.gc-solutions.net> › solutions › sales-marketing-trainings
2. <https://marketinginsidergroup.com> ›
3. <https://marketinginsidergroup.com> ›
4. <https://www.marketing-strategies-and-ideas.com>
5. <https://www.marketingteacher.com>

COURSE OUTCOME

1. Gains an insight to definition of marketing and its significance
2. Understand different process of buying and selling
3. Gives an idea of standardisation and grading of commodities
4. Provides knowledge of different aspects of pricing of goods
5. Orientation in marketing research

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	2	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	3

NON-MAJOR ELECTIVE

SEMESTER I

HUMAN RESOURCE MANAGEMENT

TOTAL HOURS: 30

COURSE CODE: 171331

CREDITS: 2

L-T-P:

COURSE OBJECTIVES:

1. Explain the importance of human resources and their effective management in organizations
2. Demonstrate a basic understanding of different tools used in forecasting and planning human resource needs
3. Describe the meanings of terminology and tools used in managing employees effectively

COURSE OUTLINE:

UNIT-I Definition – Importance of Human Resource Management – Objectives of Human Resource Management – Role of Human Resource Manager – Qualities of a Human Resource Manager

(5 Hours)

UNIT- II Selection Process – Definition -Steps - Test- Interview – Medical Examination –Recruitment

(5 Hours)

UNIT-III Training and Development –Concept – Importance -Types of Training – Methods – of training.

(10 Hours)

UNIT-IV Motivation – Definition of Motivation – Nature and Characteristics of Motivation – Importance –Process of Motivation

(5 Hours)

UNIT-V Stress –Meaning –Factors Causes Stress – Consequences – Prevention – Counselling

(5 Hours)

RECOMMENDED TEXT BOOKS:

1. Human Resource Management – J.Jayasankar
2. Human Resource Management – Aswathappa

REFERENCE BOOKS:

1. Human Resource Management - George W. Bohlander, Scott A. Snell
2. Modern Human Resource Management, Gupta C.B.

JOURNALS:

- 1. Human Resource Development Review: SAGE Journals**
- 2. Human Resource Management Review - Journal - Elsevier**

E-LEARNING RESOURCES

- 1. <https://www.humanresourcesedu.org>**
- 2. <https://www.coursera.org> › *Browse* › *Business* › *Business Strategy***
- 3. <https://managementhelp.org> › *human resources***
- 4. <https://saylordotorg.github.io> › *text human-resource-management***
- 5. <https://medium.com> › *human-resource-management-its-core-functions***

LEARNING OUTCOMES:

- 1. Understanding of the basic concepts, functions and processes of human resource management**
- 2. Aware of the role, functions and functioning of human resource department of the organizations.**
- 3. Design and formulate various HRM processes such as Recruitment, Selection, Training, Development, Performance appraisals and reward Systems, Compensation Plans and Ethical Behaviour.**
- 4. Develop ways in which human resources management might diagnose a business strategy and then facilitate the internal change necessary to accomplish the strategy**
- 5. Evaluate the developing role of human resources in the global arena.**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	2	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	3

SEMESTER II

MICRO ECONOMICS II

TOTAL HOURS:75

COURSE CODE: 171303

CREDITS: 4

L-T-P:

COURSE OBJECTIVES

1. To explain the basic concepts of scarcity and opportunity cost;
2. To enumerate the forces of demand and supply and how they interact to determine an equilibrium price;
3. To explain how and why equilibrium prices might change and their impact on resource allocation;
4. To Explain the theory of the firm;
5. To Explain the theoretical market structures of perfect competition and monopoly

COURSE OUTLINE

UNIT-I Theory of Cost – Cost -Total Cost, Average Cost and Marginal Cost-Short run cost curves –Derivation of Long run cost curves –Revenue and Revenue curves –Total, Average and Marginal revenue curves –cost and revenue curves under different market conditions

(5 Hours)

UNIT- II Competitive market: Perfect Competition-Features - Time Element and Price determination, Equilibrium of the Firm and Industry –short run and long run. Monopoly-Features –Types -price and output determination under simple monopoly-Discriminating monopoly –Meaning –Forms – Degrees of Price Discrimination –Equilibrium under Discriminating monopoly

(15 Hours)

UNIT- III Monopolistic and oligopoly market: Monopolistic competition-features- Equilibrium of the firm and industry under short and long run- Oligopoly – Types - features- Kinked Demand Curve.

(15 Hours)

UNIT- IV The Theory of Distribution –Productivity concepts –TRP, ARP, VMP, MRP – Marginal productivity theory – Rent –Economic Rent –Gross Rent – Ricardian theory of Rent—Quasi Rent-Modern Theory of Rent
(20 Hours)

UNIT- V Wages –Nominal Wage –Real Wage –Factors affecting Real wages – Interest –Gross and Net Interest –Loanable Fund Theory –Profit –Gross and Net Profit –Theories of Profit-Innovation Theory
(20 Hours)

RECOMMENDED BOOKS:

1. MicroEconomics-R.Cauvery,Dr.U.K.SudhaNayak , Dr.M.Girija,Dr.R.Meenakshi S. Chand Publishing
2. Micro Economics –S.Sankaran, Margham Publications

REFERENCE BOOKS:

1. A Text Book of Economic Theory - Alfred William Stonier, Hague Stonier, Longman Higher Education; 5th Revised edition edition
2. Micro Economics – K.K. Dewett, S. Chand Publishing

JOURNALS

- Journal of Financial Economics, Elsevier.
- Journal of Finance, American Finance Association.
- Journal of Economic Literature,

LEARNING OUTCOME

1. Understand the concepts of cost and their applicability in business situations
2. Insights to classification of markets
3. Understand the working of perfect and imperfect market and compare with real world situations
4. Understand the theories that determine the rewards paid for the factors of production
5. Insight to significance of theoretical background and determinants of wages

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	3

STATISTICS FOR ECONOMISTS – II

TOTAL HOURS:75

COURSE CODE: 171304

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. Enable to solve numerical problems using appropriate techniques
2. Ability to identify the method to adopt and prove the relationship between economic variables
3. Able to adopt regression analysis, index numbers frame methodology to analyse the future course of economic variables

COURSE OUTLINE:

- UNIT-I** Skewness and Kurtosis: Karl Pearson's co – efficient of skewness, Bowley's Co – efficient of skewness
(15 Hours)
- UNIT- II** Correlation: Meaning and Methods, Karl Pearson's co – efficient of correlation, Spearman's co – efficient of rank correlation.
(15 Hours)
- UNIT- III** Regression: Definition, Methods, Regression equations of x on y and y on x. Uses and Limitations of Regression.
(15 Hours)
- UNIT- IV** Index Numbers: Meaning, uses, Weighted and Un weighted Index Numbers, Price Index and Quantity Index, Types, Laspeyer's, Pasche's, Fisher's Price and Quantity Index Numbers, Tests of ideal index number, Time Reversal and Factor Reversal Tests, Cost of living index, Uses and Limitations.
(15 Hours)
- UNIT -V** Time series Analysis: Definition, Components and uses of Time series- methods of calculating trend-Moving average (Three yearly, four yearly and Five yearly moving average) method of least squares
(15 Hours)

RECOMMENDED TEXT BOOKS:

1. S..P.Gupta, Elementary Statistics, Sultan Chand And Sons, New Delhi, 2007

2. **R.S.N. Pillai and V. Bagavathi, Practical Statistics, S. Chand Limited, 2003**

REFERENCE BOOKS:

1. **John E. Freund, Mathematical Statistics, Prentice Hall, 1992**
2. **Richard J. Larsen and Morris L. Marx, An Introduction to Mathematical Statistics and its Applications, Prentice Hall, 2011.**

JOURNALS:

1. Journal of Applied Statistics
2. [Journal of Statistical Theory and Applications](#)

E-LEARNING RESOURCES

1. <https://www.uq.edu.au> › *student-services* › *learning* › *statistical-reference*
2. <https://www.khanacademy.org> › *math* › *statistics-probability*
3. www.statsoft.com › *Textbook* › *Basic-Statistics*
4. <https://stattrek.com> › *statistics*
5. <https://www.worldofstatistics.org> › *statistics-as-a-career*

LEARNING OUTCOME

1. Students will formulate complete, concise, and correct mathematical proofs.
2. Students will frame problems using multiple mathematical and statistical representations of relevant structures and relationships and solve using standard techniques.
3. Students will create quantitative models to solve real world problems in appropriate contexts.
4. Students will clearly communicate quantitative ideas both orally and in writing to a range of audiences.
5. Students will summarise data visually and numerically.

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	3

MARKETING-II

TOTAL HOURS: 90

COURSE CODE: 171392

CREDITS: 5

L-T-P:

COURSE OBJECTIVES:

1. Describe the major types of consumer buying behaviour, the stages in the buyer decision process and outline the components of the marketing mix
2. List and describe the steps in the new-product development process
3. Identify the roles of advertising, sales promotion, public relations, personal selling, and direct marketing in the promotion mix

COURSE OUTLINE:

UNIT-I Marketing Management- Meaning- Characteristics- Functions of Marketing Management (in brief)- Marketing Management and Sales Management (Distinction).

(15 Hours)

UNIT-II Product- Meaning- Classification- features- Product Policy- Product Line- Product Mix-Product Life Cycle- New Product Planning- Product Elimination.

(15 Hours)

UNIT-III Sales Promotion- Definition-Objectives- Importance-Factors contributing to rapid growth of Sales Promotion-Advantages and Limitations of Sales Promotion- Kinds of Sales Promotion.

(20 Hours)

UNIT-IV Advertising-Definition- Features- Objectives- Functions- Kinds- Advantages-Qualities of Advertisement Copy-Personal Selling- Definition- Difference between Personal Selling and Salesmanship- Qualities of Salesman- Types of Salesman- Process of Selling

(20 Hours)

UNIT-V Channels of Distribution: Definition- Importance- Types- Middlemen-Meaning- Types of Middlemen (Agent Middlemen, Merchant Middlemen)- Wholesaler- Classification- Retailer- Definition-Functions

and Types of Retailers- Chain Stores- Definition- Classification of Chain Store- Department Store, Chain Store Distinction

(20 Hours)

RECOMMENDED TEXT BOOKS:

1. **Modern Marketing- R.S.N. Pillai & Bhagawathi**
2. **Marketing- Dr. N. Rajan Nair**

REFERENCE BOOKS

1. **Principles of Marketing, Philip T. Kotler, Gary Armstrong**
2. **Marketing Management, Gupta C.B. , Nair Rajan**

JOURNALS

- **Journal of Marketing Research: SAGE Journals**
- **Indian Journal of Marketing**

E-LEARNING RESOURCES:

1. www.indiaeducation.net
2. <https://businessjargons.com>
3. <https://www.marketing91.com>
4. <https://www.feedough.com> ›
5. <https://www.businessmanagementideas.com>

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

**NON-MAJOR ELECTIVE
BASICS OF ECONOMICS**

TOTAL HOURS: 30

COURSE CODE:

CREDITS: 2

L-T-P:

COURSE OBJECTIVES:

1. To describe the various ideas on Economics and its related concept.
2. To evaluate and discuss the law of demand and supply
3. To impart knowledge on concepts of Indian Economy

COURSE OUTLINE:

UNIT-I	Introduction – Definition of Economics – Difference between Micro and Macro Economics	(5 Hours)
UNIT- II	Demand – Elasticity of Demand – Utility – Marginal Utility – Consumer Surplus- Supply Equilibrium.	(10 Hours)
UNIT- III	Cost – Fixed Cost – Variable Cost – Marginal Cost – Average Cost – Market Structures- Features of Perfect Competition- Monopoly – Monopolistic Competition and oligopoly	(5 Hours)
UNIT -IV	National Income – Concepts – Foreign Exchange – BOP – BOT – Inflation – Deflation-Business Cycle	(5 Hours)
UNIT- V	Indian Economy – Features – An overview of LPG	(5 Hours)

RECOMMENDED BOOKS:

1. Indian Economy - Dutt and Sundaram.
2. Indian Economy - S.Sankaran.

REFERENCE BOOKS:

1. Micro Economics –S.Sankaran
2. Micro Economics - R.Cauvery, Dr.U.K.Sudha Nayak , Dr.M.Girija, Dr.R.Meenakshi

COURSE OUTCOME:

1. Describe the various ideas on Economics and its related concept.
2. Evaluate and discuss the law of demand and supply
3. Analyze the consumer behavior pattern.
- 4.. Identify the various concept of cost and revenue
5. Able to understand nature of Indian economy

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	2	3	3
CO4	3	2	3	3	3
CO5	3	3	3	3	3
Average	3	2.8	2.6	3	3

SEMESTER III

INDIAN ECONOMY -1

TOTAL HOURS: 75

COURSE CODE: 171305

CREDITS: 4

L-T-P:

COURSE OBJECTIVE:

1. To identify the issues and problems of Indian Economy
2. To understand the concepts and calculation of National Income in India
3. to familiarize the issues associated with population and Agriculture

COURSE OUTLINE

UNIT- I Concept of Economic Growth and Development - Features of the Indian Economy- Major issues of Economic development in India.

(15 Hours)

UNIT -II Capital Formation –Physical Capital –Human Capital –Sources of Saving –Causes for low rate of Saving

(15 Hours)

UNIT -III Definition of National Income– Concepts of National Income –Methods – Difficulties in the Calculation of National Income –Recent Trends in National Income in India

(15 Hours)

UNIT- IV Human Resources – Causes for the growth of Population –Population Explosion- Problems – Measures to solve the problem-Human Capital formation in India

(15 Hours)

UNIT- V Agriculture: Features of Agriculture sector in Indian Economy –Land reforms- Green Revolution-Agriculture in Five year plans –Problems and Programmes

(15 Hours)

RECOMMENDED TEXT BOOKS:

1. Indian Economy	I.C.Dhingra.
2. Indian Economy	Dutt and Sundaram.
3. Indian Economy	S.Sankaran.

REFERENCE BOOKS

1. Indian Economy	A.N. Agarwal
2. Macro-economic Theory	M.L.Jhingan
3. Macro-Economic Theory	M.C.Vaish

JOURNALS

1. Economic and Political Weekly

2. Southern Economist

E-LEARNING RESOURCES

1. <http://dare.nic.in>
2. <http://agri.gov.in>
3. <http://www.niam.gov.in>
4. <https://economictimes.indiatimes.com>

COURSE OUTCOME:

1. Understand the Economic Issues and concepts of various sectors of the Indian Economy.
2. Understand the importance of Human Resources and Human Capital in the growth of an Economy.
3. Learn the problems and issues which hinders the development of an Economy.
4. Awareness about the historical and theoretical perspectives of the development of Indian Economy
5. Understand agriculture as the foundation of economic growth and development, analyse the progress and changing nature of agricultural sector and its contribution to the economy as a whole

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	2
CO5	3	3	3	2	3
Average	3	3	3	2.8	2.8

MONETARY ECONOMICS I

TOTAL HOURS: 60
CREDITS: 4

COURSE CODE: 171306
L-T-P:

LEARNING OBJECTIVES:

1. To give insight into the introduction about monetary standard, principles of note issues and the demand for money and supply of money
2. To enable the students to understand monetary procedure, principles and helps to understand methods of measuring money supply in India
3. Develop understanding of the theories that relate to the existence of money, explaining why it is demanded by individuals and used in the trading process

COURSE OUTLINE:

- UNIT- I** **Definition of money-Evolution of money-barter system-Functions of money -primary functions-secondary functions of money-significance of money**
(15 Hours)
- UNIT -II** **Classification of money-classification on the basis of nature of money:- Actual money- money of account; Classification on the basis of legality:- Legal tender money,-Optional money, classification on the basis of money-commodity:-metallic money, paper money, classification on the basis of liquidity- Actual money, near money**
(10 Hours)
- UNIT- III** **Monetary standard-Meaning- types of monetary standard- Metallic standard:-mono metallism -silver standard, gold standard, gold bullion standard ,gold parity standard -Bimetallism -paper currency standard-principles of note issue- method of note issue-qualities of a good monetary standard-Gresham's law-India's present monetary standard-Demonetizations - (Definition only)**
(15 Hours)
- UNIT- IV** **Demand for money-meaning- classical view of demand for money-Keynesian view of demand for money-transaction motive, precautionary motive, speculative motive**
(10 Hours)

UNIT- V Supply of money –meaning- Three agencies creating money (Central bank, Government, commercial banks) - composition of money supply in India- M1, M2, M3, M4. Factors determining money supply in India

(10 Hours)

RECOMMENDED TEXT BOOKS

1. Money, Banking, Trade and Finance	K.P.M. Sundaram
2. Monetary Economics	M.L.Seth

REFERENCE BOOKS:

1. A Treatise on Money	J.M.Keynes
2. An Outline of Money	M.L.Jhingan
3. Money, Banking, Trade and Public Finance	D.M.Mithani

E-LEARNING RESOURCE:

1. <https://medium.com › brief-history-and-evolution-of-currenc>
2. <https://www.tutorhelpdesk.com>
3. <https://www.intelligenteconomist.com>
4. <https://www.cliffsnotes.com>
5. <https://www.toppr.com ›>

COURSE OUTCOME

1. Understand the concepts and functions of Money
2. Give insights in to the different classification of Money
3. Inculcates the Knowledge in Monetary Standards
4. Understand the variables influencing demand for Money
5. Gains knowledge in forces determining supply of money

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	2	3	3	3	3
CO3	3	2	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	2.8	2.8	3	3	3

MATHEMATICAL ECONOMICS

TOTAL HOURS:75

COURSE CODE: 171393

CREDITS: 5

L-T-P:

COURSE OBJECTIVES:

5. To introduce students to the most fundamental aspects of mathematical economics
6. To develop critical thinking and problem-solving empirical research and building capabilities.
7. To Analyse nonlinear functions using differential calculus

COURSE OUTLINE:

UNIT- I An Introduction to Mathematical Economics - Mathematical Economics – Definition - Nature and Scope of mathematical Economics - Relationship between Mathematical Economics, Econometrics and Statistics – Limitations.

(10 Hours)

UNIT -II Natural Numbers and Integers - Fractions and Rational numbers, Irrational Numbers - Real Numbers - Imaginary Numbers - Complex Numbers - Variables and Constants - Discrete and Continuous variables - Linear form of functions – Endogenous - Exogenous - Dependent and Independent Functions.

(20 Hours)

UNIT -III Matrix – Definition - Types of Matrices - Sum and Differences of matrices - Product of the matrix - Inverse of a Matrix.

(15 Hours)

UNIT- IV Set Theory - Fundamental concepts – Types- Set operations Union of Sets - Intersection of Sets - Difference of Sets – DeMorgan's Law for set difference .

(15 Hours)

UNIT -V Differential calculus - Definition - Rules of Differentiation – Addition-Subtraction - Multiplication and Quotient .

(15 Hours)

RECOMMENDED BOOKS:

1. Metha B.C. and Madnani G.M.K. (1997) . Mathematics for Economists, Sultan Chand and Sons Publishers, New Delhi.
2. Yamane Taro (1976) . Mathematics for Economists. An Elementary McGraw Hill International Students Edition. Survey, Prentice Hall of India Pvt. Ltd, New Delhi.

REFERENCE BOOKS:

1. Weber, Jean.E (1982). Mathematical Analysis. Business and Economic Applications, Harper and Pow publishers, New York .
2. Chiang A.C (1985), Fundamental Methods of Mathematical Economics,

JOURNALS:

1. *Journal of Mathematical Economics.*
2. *Journal of Mathematical Economics and Finance*

E-LEARNING RESOURCES:

1. www.econometrie.nl ›
2. <https://www.coursera.org>
3. www.maths.surrey.ac.uk
4. <https://revisionmaths.com>
5. <https://www.calculus-help.com>

COURSE OUTCOME:

1. Students will be able to set up and solve mathematical and economic models using a broad range of significant mathematical techniques.
2. Students will recognize what constitutes mathematical and economic thinking, including the ability to produce and judge the validity of rigorous mathematical arguments when applied to mathematical and economic problems.
3. Students will be able to communicate economic and mathematical ideas and arguments.
4. Students will be prepared to use mathematics and the tools of economics in their future endeavours.
5. Analytical ability to solve business problems using mathematical and statistical knowledge.

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	2	3	3
CO4	3	2	3	3	3

CO5	3	3	3	3	3
Average	3	2.8	2.8	3	3

SEMESTER IV

INDIAN ECONOMY-II

TOTAL HOURS: 75

COURSE CODE: 171307

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. To equip the students with the theoretical, empirical and policy issues relating to the society, polity and economy of India.
2. To highlight role of MSMEs and Large-Scale Industries in the Economic Development of India
3. To create awareness about socio-economic issues of poverty and highlight the remedial Measures

COURSE OUTLINE:

UNIT -I Definition of MSME- (Cottage –Tiny Industry) - Problems of MSME – Measures to promote MSME –Recent Policy for promoting MSMEs.

(15 Hours)

UNIT -II Large Scale Industries –Industrial Development in India –Iron and Steel Industry –Cotton –Sugar –Cement and Tea. New Industrial Policy of 1991.

(15 Hours)

UNIT -III Poverty –absolute Poverty –Relative Poverty –Causes of Poverty –Poverty Alleviation Programme –Unemployment –kinds of unemployment – Problems of unemployment- Measures to solve the problem of unemployment.

(15 Hours)

UNIT -IV Planning- Objectives of Five Year Plan-Sectoral Outlays-Assessment of Eleventh five Year Plan-Objectives of Twelfth Five Year Plan.

(15 Hours)

UNIT- V Foreign Trade - Contribution of Trade and Economic Development – Analysis of India's Foreign Trade –Composition of Trade –Direction of Trade –New Export –Import Policy 2002-07

(15 Hours)

RECOMMENDED BOOKS:

1. Indian Economy Dutt and Sundaram
2. Indian Economy S.Sankaran

REFERENCE BOOKS :

1. Indian Economy A.N.Agarwal
2. Agricultural Financing and India S.N Ghosal
3. Economic Survey Various Issues
4. Government of India Five Year Plan Reports

JOURNALS:

- *The Indian Economic Journal*
- *Indian Economic Review*

E-LEARNING RESOURCES:

1. <https://economictimes.indiatimes.com>
2. <https://www.economist.com>
3. <https://data.gov.in> › dataset-group-name › Indian-economy
4. <https://www.focus-economics.com>
5. <https://www.researchgate.net>

COURSE OUTCOME:

1. Employ economic theory, broadly defined, to provide an original analysis of current or historical events,
2. Able to analyse social problems, and evaluate alternative public policy choices.
3. Present the results of their research using appropriate economic theories, concepts, and terminology
4. To able to understand economic planning in India 4. To able to understand recent structural changes in economy
5. To create awareness about developments in Indian Economy

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

MONETARY ECONOMICS –II

TOTAL HOURS:60

COURSE CODE: 171308

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. To impart knowledge on value of money and evaluation of quantity theory of money and velocity of Circulation of Money
2. To examine various theories of money and Keynesian approach.
3. To impart knowledge on inflation and various instruments of Monetary policy

COURSE OUTLINE:

- UNIT-I** **Velocity of money circulation – meaning- factors affecting velocity of circulation money Circular flow of money-two sectorial model three sectorial model - Neutrality & non neutrality of money-meaning**
(15 Hours)
- UNIT- II** **Value of money-Quantity theory of money- fisher’s Transaction approach-criticism of quantity theory and transaction approach-Cash balance approach (statement of the theory) criticisms of the cash balance approach-Keynesian theory of demand for money.**
(15 Hours)
- UNIT- III** **Theories of money -Friedman’s theory of demand for money-Real balance effect- Pigou effect - Patinkin’s analysis –criticism of Patinkin’s theory**
(15 Hours)
- UNIT- IV** **Inflation –meaning types, effects of inflation-measures to control inflation- inflationary gap-deflation, stagflation-meaning**
(10 Hours)
- UNIT -V** **Monetary policy-meaning-objectives-instruments of monetary policy-bank rate-open market operations-variable cash reserve ratio**
(5 Hours)

RECOMMENDED TEXT BOOKS:

1. Money, Banking, Trade and Finance	K.P.M. Sundaram
2. Monetary Economics	M.L. Seth

REFERENCE BOOKS

1. A Treatise on Money	J.M. Keynes
2. An Outline of Money	M.L. Jhingan
3. Money, Banking, Trade and Public Finance	D.M.Mithani

JOURNALS

- **Journal of Monetary Economics - Elsevier**
- **International Journal of Monetary Economics and Finance**

E-LEARNING RESOURCE

1. <https://marketbusinessnews.com>
2. www.economicdiscussion.net
3. www.yourarticlelibrary.com
4. <https://www.moneycrashers.com>
5. <https://www.econlib.org>

COURSE OUTCOME

1. **Understand the policies influencing supply of Money**
2. **Calculate the value of money and limitations of calculating**
3. **Understand basic theories of money**
4. **Understand the concepts and impact of inflation**
5. **Gain Knowledge in monetary policy**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	2	3	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	2.8

ECONOMETRICS

TOTAL HOURS:75

COURSE CODE: 171394

CREDITS: 5

L-T-P:

LEARNING OBJECTIVES:

1. To develop analytical skills in the application of econometric theory, knowledge, principles, techniques and data.:
2. To apply the appropriate economic concepts to formulate plans of analysis that employ modern econometric practice;
3. To apply modern econometric methods covering time series analysis, financial econometrics, micro econometrics, macro econometrics and structural econometric modelling;

COURSE OUTLINE:

UNIT-I Econometrics – Definition - Objectives - Scope of Econometrics= Limitations.

(15 Hours)

UNIT -II Division of Econometrics - Relationship between mathematical economics , Econometrics and Statistics - Methodology of econometrics-Specification - Collection of Data- Estimation verification - Application (Theory).

(15 Hours)

UNIT -III Simple Linear Regression model - Functional relationships - Cost function- Supply function - Product Function - Stochastic and Non-stochastic relation - Difference between Stochastic and non-stochastic relations (Theory).

(15 Hours)

UNIT-IV Reasons for the Inclusion of Random variable - omission of variables from the function - Random behavior of human beings – Misspecification of equation- Errors of aggregation- Errors of measurement - Assumptions of Linear Stochastic Regression model- Stochastic Assumptions of ordinary least square (Theory).

(15 Hours)

UNIT-V The Distribution of the dependent variable - The method of least square method-Meaning - Desirable properties of Estimators - Small sample

properties of the estimators - Unbiasedness - Least Variance –Efficiency
 - BLU - Least mean square error (LMSE) - Sufficiency- Large sample
 properties of Estimators - Asymptotic unbiasedness - Consistency
 Asymptotic Efficiency. (Theory).

(15 Hours)

RECOMMENDED BOOKS:

1. Gujarati Damodar N: Basic Econometrics, 3rd McGraw Hill, Newyork, (1995)
2. Klein Lawrence. R. : An Introduction to Econometrics, Prentice Hall, Inc, Englewood, Cliffs, N.J. (1962).
3. Schaum's Outlines : Statistics and Econometrics.

REFERENCE BOOKS:

1. Schaum's Outlines : Statistics and Econometrics.

JOURNALS:

1. Journal of Econometrics, Managing Editor: Serena N Columbia University
Department of Economics, New York, New York, United States
2. Journal of Applied Econometrics Edited By: Barbara Rossi
3. Journal Rankings on Economics and Econometrics
4. Journal of Economic Literature and the Journal of Economic Perspectives
5. *Journal of Financial Econometrics*, Volume 17, Issue 3, Summer 2019., EDITOR
Farewell Editorial

E-LEARNING RESOURCE

1. <https://digitaldefynd.com/best-econometrics -courses/>
2. <https://www.mytutorsonline.org/>
3. <https://www.coursera.org> ›
4. <https:// www.journals.elsevier.com/journal-of-econometrics>
5. <https://onlinelibrary.wiley.com/journal>

COURSE OUTCOME:

1. Enable analytical skills in the application of econometric theory, knowledge, principles, techniques and data.
2. Enables to apply the appropriate economic concepts to formulate plans of analysis that employ modern econometric practice;
3. Imparts Knowledge on modern econometric methods covering time series analysis, financial econometrics, micro econometrics, macro econometrics and structural econometric

4. Able to estimate and interpret linear regression models and be able to distinguish between economic and statistical importance
5. Enables to formulate and estimate appropriate models, interpret the results and test their statistical significance.

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	2	3	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	2.8

SEMESTER V

MACRO ECONOMICS – I

TOTAL HOURS: 90

COURSE CODE: 171309

CREDITS: 4

L-T-P:

COURSE OBJECTIVE:

1. To familiarize the student with the generally accepted principles of Macro Economics.
2. To give an insight in to the dynamics of various policies of our economy.
3. To Impart knowledge about importance of development in consumption function

COURSE OUTLINE:

UNIT-I Introduction to Macro Economics Nature and scope of Macro Economics
- Micro, Macro economics

(10 Hours)

UNIT- II National Income - Definitions of national income – Gross National Production (GNP) – Net national product (NNP) – Measurement of national income - Difficulties in the measurement of N.I - Uses of national income estimates.

(20 Hours)

UNIT- III Theories of employment - Classical theory of income and employment - Keynesian model of income and employment - Determination - concepts of aggregate demand and aggregate supply.

(20 Hours)

UNIT- IV The consumption function - Meaning of consumption function - Average and Marginal propensity to consume - Determinants of the consumption function - Keynes psychological law of consumption - measures to raise the prosperity to consume.

(20 Hours)

UNIT- V The Investment Function - Concepts of investment - Autonomous and induced investment - Factors determining investment - The marginal efficiency of investment - Rate of discount – Prospective yield - Supply price - Factors affecting inducement to invest.

RECOMMENDED TEXT BOOKS:

1. Rana, K.C and K.N.Verma, Macro Economic Analysis, Vishal Publications 1998
2. M.L.Jhingan Macro economic Theory, Vrinda Publications(P)Ltd

REFERENCE BOOKS:

1. Edward Shapiro, Macro Economic Analysis, Golgotia Publications Pvt. Ltd: New Delhi
2. R.D.Gupta , Introduction to post Keynesian Economics , Kalyani Publishers
3. M.C.Vaish Macro Economic Theory , Wishwa Publications Private Ltd

JOURNALS

1. Journal of Macroeconomics, Editors: William Lastrapes, David Van Hoose, Ping Wang
2. South Asian Journal of Macro Economics and Public Finance-Sage Journals

E-LEARNING RESOURCES:

1. <https://www.tutorsonnet.com/nature-and-scope-of-macro-economics>
2. <https://edurev.in/studytube/Nature-and-Scope-of-Macroeconomics>
3. <https://www.jagranjosh.com/general-knowledge/what-is-national-income-basic-concepts->
4. <http://www.economicdiscussion.net/theories/two-important-theories-of-income-and-employment-micro-economics>
5. <https://www.investopedia.com/terms/c/consumptionfunction.asp>

COURSE OUTCOME:

1. Enable to understand nature and scope macro-economic analysis
2. Enable to understand basic concepts of national income
3. Enable to understand classical & Keynesian theories of output and employment
4. Enable to understand consumption function and theories
5. Enable to understand Investment function and theories

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	2	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	2.8	2.8

PUBLIC FINANCE –I

TOTAL HOURS: 90

COURSE CODE: 171310

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. To Understand the sources of finance both public and private, demonstrate the role of government
2. To understand the causes and effects of growing public expenditures for various programs and policies within the country.
3. To enable the students to know about benefits of various types of taxes

COURSE OUTLINE

- UNIT-I** **Public Finance –Definition –Scope and Importance -Public finance and Private finance –Principle of Maximum Social Advantage**
(11 Hours)
- UNIT- II** **Public Revenue –sources of Tax and non-tax revenue- -Theories of Taxation –Cost of Service Theory – Benefit Principle –Ability to Pay Theory –Measurements of ability to pay.**
(18 Hours)
- UNIT- III** **Tax Revenue-Definition of tax – features of a tax –direct and indirect tax – Merits and Demerits –Progressive, Proportional, Regressive and Taxes**
(16 Hours)
- UNIT-IV** **Direct and Indirect Tax - Income Tax –Merits and Demerits –Sales tax merits and demerits –VAT –MANVAT –MODVAT –Capital Gains Tax – Wealth Tax-GST**
(27 Hours)
- UNIT-V** **Shifting and Incidence of taxes -Theories of Shifting –Concentration, Diffusion, Modern Theory, Factors affecting incidence of Tax- Taxable capacity-meaning- factors determining taxable capacity.**
(18 Hours)

RECOMMENDED BOOKS:

1. Sankaran. S - Fiscal Economics.
2. K.P.M. Sundaram - Public Finance Theory and Practice

REFERENCE BOOKS:

1. Bhargava R.N. - Indian public finance.
2. Bhatia - Public finance.
3. Sundaram K.P.M. - Fiscal Economics.

JOURNALS

1. Journal of Public Economics - Elsevier
2. Journal of Public Finance and Public Choice

E-LEARNING RESOURCES

1. [www.economicsdiscussion.net>public finance-and –private –finance](http://www.economicsdiscussion.net/public-finance-and-private-finance)
2. www.economicsconcepts.com
3. <http://www.business-standard.com>
4. [https://www.myadvo.in>blog>value-added-tax-in-India](https://www.myadvo.in/blog/value-added-tax-in-India)
5. [www.businessdictionary.com>definition>shifting-and-incidence-of-taxation](http://www.businessdictionary.com/definition/shifting-and-incidence-of-taxation)

COURSE OUTCOME:

1. Enable to learn the concept of public finance
2. Understand the theories of taxation
3. Gain understanding of incidence & approaches of taxation
4. Insight to rationale for government intervention in Public finance
5. Recognize the importance of tax shifting to policy makers

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

INTERNATIONAL ECONOMICS I

TOTAL HOURS: 90

COURSE CODE: 171311

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

- 1. To understand the basic concept of international trade**
- 2. To identify the basic difference between inter-regional and international trade**
- 3. Give insight to how international trade has helped countries to acquire goods at cheaper cost and explain it through the various international trade theories.**

COURSE OUTLINE:

UNIT- I Introduction - definition of International economics – features-difference between interregional and international trade and similarities

(15 Hours)

UNIT- II International Trade Equilibrium- Analytical Tools Introduction – production possibility curves- Types -community indifference curves-the offer curve-meaning -features -equilibrium-the trade indifference curves-the box diagram.

(20 Hours)

UNIT- III The Classical Theory of Comparative Cost Introduction –Adam smith theory of absolute differences in costs, Ricardo’s theory of comparative costs.

(15 Hours)

UNIT-IV Haberler Theory and Modern Theory of International Trade -Introduction -the theory of opportunity costs, Critical Appraisal- Heckscher-ohlin theory - Critical Appraisal.

(20 Hours)

UNIT- V Free Trade vs Protection & Tariff - Free trade meaning features- advantages and disadvantages-protection –meaning –merits and demerits. Tariff-meaning-types effects on a large country-optimum tariff welfare effects of tariff on income distribution.

(20 Hours)

RECOMMENDED BOOKS

- International Economics – M.L.jhingan**
- International Economics – Sodersten, Bo. And Reed, G**

- Theory of International trade - Dixit and Norman v

REFERENCE BOOKS:

1. International Economics: Theory and Policy – Paul Krugman
2. International Economics – Mithani,D.M
3. Money,Banking,Trade and Finance – Sundharam, K.P.M
4. International Trade – Neelamegam,V
5. International Trade – V.Radha

JOURNALS

- International Economic Journal – Taylir and Francis
- International Economics and Economic Policy – Springer

E – LEARNING RESOURCES

1. <https://www.tutor2u.net>
2. <http://www.economicdiscussion.net>
3. <https://saylordotorg.github.io>
4. <https://are.berkeley.edu>
5. <https://www.econlib.org>

LEARNING OUTCOME:

1. Identify the basic difference between inter-regional and international trade
2. Understand the basic concepts of international economics
3. Enables to learn theoretical background of international theories
4. Insight to trade practices adopted by various countries
5. Explain how restrictions to international trade would limit a nation in the services and goods produced within its territories and at the same time explain that a rise in international trade is essential

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	2	3	3	3
CO3	3	3	2	3	3
CO4	3	3	3	3	2
CO5	3	3	3	3	2
Average	3	2.8	2.8	3	2.6

MANAGERIAL ECONOMICS – I

TOTAL HOURS: 90

COURSE CODE: 171312

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. To bring out the nature and scope of managerial economics and its related concepts.
2. To familiarize with demand and forecasting techniques
3. To understand cost analysis and related concepts.

COURSE OUTLINE:

- UNIT- I** **Introduction – Definition - Nature and scope of Managerial Economics – Fundamental Concepts. Objectives of the firm-Role of managerial economists.**
(15 Hours)
- UNIT- II** **Managerial Decision Making - Meaning- Types of decision making - process of decision making- Decision making under risk and uncertainty.**
(20 Hours)
- UNIT- III** **Marginal and Incremental Analysis- Role of marginal analysis in managerial decision making- fundamental theorems of resource allocation- Marginal analysis - Incremental analysis.**
(15 Hours)
- UNIT-IV** **Demand Forecasting: Demand Forecasting-objectives-Approaches methods of Demand Forecasting-Methods of demand forecasting -feature of good forecast-New product forecasting.**
(20 Hours)
- UNIT-V** **Cost Control and Cost Reduction - Cost control -Techniques of cost control. Cost-Reduction – Techniques of cost reduction - Essentials for the success of a cost reduction programme - Factors hindering cost control.**
(20 Hours)

RECOMMENDED BOOKS:

1. Managerial Economics - H.L.Ahuja
2. Managerial Economics- Dr.Mithani –D.M

REFERENCE BOOKS:

1. Managerial Economics - R.Gauvery,Sudhanagak,Grija and Meenakeshi
2. Managerial Economics - Metha P.I.
3. Modern Economic Theory – Dewett.K.K.
4. Managerial Economics – Sankaran

JOURNALS:

1. Journal of Business Economics and Management:
2. The IUP Journal of Managerial Economics -

E-LEARNING RESOURCES:

1. <https://www.managementstudyguide.com>
2. <https://www.businessmanagementideas.com>
3. www.managerialskills.org
4. <https://www.businessstudynotes.com>
5. <https://www.costmanagement.eu>

COURSE OUTCOME:

1. Understanding the nature and scope of managerial economics and its related concepts.
2. Gain insight to managerial decision making
3. Understand the marginal and incremental analysis in decision making
4. Gain knowledge on importance of demand forecasting and techniques
5. Understand cost analysis and related concepts.

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

ECONOMIC THOUGHT

TOTAL HOURS: 75

COURSE CODE: 171313

CREDITS: 5

L-T-P:

COURSE OBJECTIVES:

1. Create an understanding of development of economic thought
2. To understand the viewpoints of Alfred Marshall, Ricardo and J.S. Mill
3. To understand the contributions of neo-classical Economists, Keynes and Indian contributors

COURSE OUTLINE:

UNIT-I Nature and significance of the History of Economic thought - Mercantilism - Physiocracy.

(15 Hours)

UNIT-II Classical school - Adam Smith - Wealth definition - Division of labour - Functions of State (3 duties) - Public Finance - Canons of Taxation - T.R. Malthus - Theory of population - D. Ricardo - Doctrine of Rent - J.S. Mill - scope of political economy - J.B. Say - law of market.

(15 Hours)

UNIT-III Neo-Classicism- J.B. Clark - Philosophy of wealth - Irving Fisher - publication - quantity theory of money - Taussig - contribution towards international trade and labour unions

(15 Hours)

UNIT -V Keynesian revolution - Keynesian theory of Income, Output and employment

(15 Hours)

UNIT-V Indian Economic Thought - D. Naoroji - Ranade - Gokhale - M.K. Gandhi - B.R. Ambedkar - Rajaji - Nehru - V.K.R.V. Rao - Amartya Sen - Thiruvalluvar - E.V.R. Periyar - List of Noble laureates in economics

(15 Hours)

RECOMMENDED BOOKS:

1. T.N. Hajela - History of Economic Thought
2. Srivatsava - History of Economic Thought

REFERENCE BOOKS:

1. Sankaran. S - A History of Economic Thought
2. Lokanathan-History of Economic Thought
3. L.H. Haney - History of Economic Thought
4. Dr. Shanmugam - Indian Economic Thought

JOURNALS

- The Journal of the History of Economic Thought
- History of Economic Ideas

E-LEARNING RESOURCES:

1. <https://www.ineteconomics.org>
2. <https://www.econlib.org>
3. <https://www.exploring-economics.org>
4. <https://www.pbs.org>
5. www.economicsdiscussion.net ›

COURSE OUTCOME:

1. Traces the evolution of economic thought
2. Understanding of contributions of classical school of thought
3. Understanding Contributions of neo-classical economists
4. Gains insight on Keynesian concepts and its relevance in modern era
5. Tracing the evolution of economic thought in India

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2
CO2	3	2	2	3	2
CO3	3	3	2	2	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	2.8	2.6	2.8	2.6

SEMESTER VI

MACRO ECONOMICS – II

TOTAL HOURS: 90

COURSE CODE: 171314

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

- 1. To Enhance the knowledge on Income multiplier and accelerator.**
- 2. To gain knowledge on working of trade cycle**
- 3. An insight to general equilibrium analysis and demonstrate an understanding of monetary and fiscal policy options**

COURSE OUTLINE:

- UNIT-I** **Multiplier and Accelerator - Concept of multiplier - Investment Multiplier - Operation of Multiplier - Assumptions of Multiplier - Leakages of Multiplier - Importance of Multiplier - Employment Multiplier - Principle of Acceleration - Operation of Accelerator - Interaction of Multiplier and Accelerator.**
- (15 Hours)**
- UNIT-II** **Trade cycle Theory-Meaning - Phases of Business cycle - Hawtreys theory - Keynes Theory of trade cycle - Samuelson model of trade cycle - Hicks model of trade cycle .**
- (15 Hours)**
- UNIT-III** **General Equilibrium-Product market Equilibrium - Money market equilibrium - Derivation of IS-LM curves – General Equilibrium of product and money market**
- (20 Hours)**
- UNIT-IV** **Macro Economic Policy-Objective of Macro Economic policy - Instruments of Macro Economic policy.**
- (20 Hours)**
- UNIT-V** **Keynesian Techniques in Underdeveloped countries - Keynesian assumptions and underdeveloped countries - Applicability of Keynesian tools in underdeveloped countries - Prosperity to consume - Marginal efficiency of capital - Rate of interest and multiplier - Policy measures.**
- (20 Hours)**

RECOMMENDED BOOKS:

1. Rana K.C and K.N.Verma, Macro Economic Analysis, Vishal Publications 1998
2. Edward Shapiro, Macro Economic Analysis, Golgotia Publications Pvt.Ltd: New Delhi

REFERENCE BOOKS:

1. R.D.Gupta, Introduction to Post Keynesian Economics, Kalyani Publishers
2. M.L.Jhingan Macro economic Theory, Vrinda Publications(P)Ltd
3. M.C.Vaish Macro Economic Theory, Wishwa Publications Private Ltd

JOURNALS

1. Journal of Macroeconomics, Editors: William Lastrapes, David Van Hoose, Ping Wang
2. South Asian Journal of Macro Economics and Public Finance-Sage Journals

E-LEARNING RESOURCES

1. <https://www.tutorsonnet.com/nature-and-scope-of-macro-economics-homework-help.php>
2. <https://edurev.in/studytube/Nature-and-Scope-of-Macroeconomics-->
3. <http://www.economicdiscussion.net/theories/two-important-theories-of-income-and-employment-micro-economics>

COURSE OUTCOME:

1. Insight in to the working of Income multiplier and Induced investment and the principle of accelerator
2. Review the occurrence of trade cycle
3. To interpret the monetary and real sector equilibrium through ISLM framework
4. Understand the tools for macro- economic policy for economic stability
5. Learn the relevance of Keynesian economics in UDCs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3

Average	3	3	3	3	3

PUBLIC FINANCE –II

TOTAL HOURS: 90

COURSE CODE: 171315

CREDITS: 4

L-T-P:

COURSE OBJECTIVE:

1. To get an birds eye view of the fiscal structure and functions of the financial machinery of a country
2. To study the process of raising and dispersion of funds for the functioning of the Government
3. To learn the key challenges of fiscal policy in achieving sufficient revenues, economic prosperity and development and in addressing social justice and inequality in a context of globalisation

COURSE OUTLINE:

- UNIT-I** **Public Expenditure – Meaning, Classification–Effects on Production, Distribution –Causes of Growth of Public Expenditure**
(15 Hours)
- UNIT-II** **Public debt –Meaning –Public Debt -Private debt, Objectives – Classification –Causes for Public debt-Types –effects –India’s Public debt**
(20 Hours)
- UNIT-III** **Fiscal policy - meaning –objectives –instruments of Fiscal policy in India**
(15 Hours)
- UNIT -IV** **Budget –Purpose –Types –process of budgeting- qualities of a good budget –Deficit financing – Meaning –objectives**
(20 Hours)
- UNIT-V** **Federal finance – meaning –principles – functions of central government- Centre and State Financial Relations, Tax Structure of centre and state government-Finance Commission –Functions**
(20 Hours)

RECOMMENDED BOOKS:

1. Bhargava R.N. - Indian public finance.

2. Sankaran. S - Fiscal Economics.

REFERENCE BOOKS

- 1. Bhatia - Public finance.**
- 2. Sundaram K.P.M. - Fiscal Economics.**
- 3. K.P.M. Sundaram - Public Finance Theory and Practice**

JOURNALS

- 1. Journal of Public Economics - Elsevier**
- 2. Journal of Public Finance and Public Choice**

E-LEARNING RESOURCES

- 1. <https://www.treasury.gov>**
- 2. [www.economics discussion.net](http://www.economicsdiscussion.net)>India>public Expenditure**
- 3. <https://www.oecd-library.org>>fiscal policy-in-India**
- 4. <https://www.india budget.gov.in>**
- 5. [www.economics discussion.net](http://www.economicsdiscussion.net)>economics-2>features of federal finance**

COURSE OUTCOME:

- 1. Demonstrate a good understanding of the fiscal framework for taxing and spending and of fiscal policy principles**
- 2. Analyse critically tax reforms and policy choices in developed and developing countries**
- 3. Understand the relation between financial operation and the growth process of the economic system as a whole**
- 4. This subject facilitates the understanding and analysis of budgetary policy**
- 5. Enables to understand how it helps to achieve price stability and full employment level and sustainable growth in the economy**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

INTERNATIONAL ECONOMICS II

TOTAL HOURS: 90

COURSE CODE: 171316

CREDITS: 4

L-T-P:

COURSE OBJECTIVES:

1. Study about the meaning of quota and tariff and exchange rates
2. Provide an understanding about the foreign exchange, balance of payment and its components.
3. Know the objectives, and achievements of International Monetary Fund and world trade organizations.

COURSE OUTLINE:

UNIT-I	Non tariff barriers and Quota Meaning – classification- type of NBTS- meaning – types-effects of import quota –import quota vs tariff (15 Hours)
UNIT-II	Foreign Exchange Rate -Meaning-determination of exchange rate - theories – causes for change in exchange rate (15 Hours)
UNIT-III	Foreign Exchange Rate Policy-Introduction –fixed flexible exchange rate- hybrid-and multiple exchange rate-exchange control-meaning objectives – methods-merits and demerits of exchange control (20 Hours)
UNIT -IV	Balance of Trade - Meaning-Balance of Payments- Meaning-components of BOP- disequilibrium in BOP-causes-Measures to overcome disequilibrium in BOP (20 Hours)
UNIT-V	IMF and World bank -Origin of IMF – Membership-functions working of the fund -IMF and India.-world bank functions – membership- organisation-funding strategy borrowings and lending activities –critical appraisal-WTO- features (20 Hours)

RECOMMENDED BOOKS:

1. International Economics – M.L.jhingan
2. International Economics – Sodersten,Bo. And Reed,G
3. Theory of International trade - Dixit and Norman v

REFERENCE BOOKS:

1. **International Economics: Theory and Policy – Paul Krugman**
2. **International Economics – Mithani,D.M**
3. **Money,Banking,Trade and Finance – Sundharam, K.P.M**
4. **International Trade – Neelamegam,V**
5. **Theories of International economics – Peter m.lichtensten**

JOURNALS:

International Economic Journal – Taylor and Francis

International Economics and Economic Policy – Springer

Journal of Global Economics

Southern Economist

E – LEARNING RESOURCES:

1. <https://www.tradebarriers.org> ›
2. <https://www.economicsonline.co.uk>
3. <https://www.thebalance.com>
4. <https://www.economicshelp.org>
5. <https://www.imf.org>

LEARNING OUTCOME:

1. **Enables to understand non-tariff barriers role in international trade**
2. **Give an insight to determination of exchange rate and relevant theories**
3. **Enables to understand foreign exchange rate in global environment**
4. **Signifies the importance of Balance of Payments and causes for disequilibrium and corrective measures**
5. **Identify the role of IMF and WTO in promoting international trade**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

MANAGERIAL ECONOMICS – II

TOTAL HOURS: 90

COURSE CODE: 171317

CREDITS: 5

L-T-P:

COURSE OBJECTIVE:

1. Analyse the different pricing techniques
2. To impart knowledge about various theories of profit
3. To impart the techniques of capital budgeting and measures of project appraisal

COURSE OUTLINE:

UNIT-I Pricing and Specific Pricing Problems - Pricing methods – Methods-Specific pricing problems -Pricing of joint product, Pricing of new product, skimming pricing strategy, penetration and Pricing over life cycle of product.

(15 hours)

UNIT- II Profit And Profit Measurement - Meaning of profit - Theories of profit - uncertainty theory- dynamic theory - innovative theory.Measurement of profit - Methods of measuring profit.

(15 hours)

UNIT- III Profit Policies and Profit Planning - Profit policies - meaning - policies-Profit planning - meaning - Break Even Analysis - usefulness and limitations.

(20 hours)

UNIT -IV Capital Budgeting - Meaning and need for capital budgeting –Forms of capital budgeting – problems in capital budgeting-demand and supply of capital. Capital rationing.

(20 hours)

UNIT- V Cost of Capital and Project Profitability - Cost of capital- Definition - Types of cost of capital. Project Profitability - methods of project appraisal – Project Evaluation - Importance.

(20 hours)

RECOMMENDED BOOKS:

1. Business Economics - Sankaran
2. Managerial Economics - R.Gauvery, Sudhanagak,Grija and Meenakeshi

REFERENCE BOOKS:

1. **Managerial Economics- Dr.Mithani –D.M**
2. **Managerial Economics - Metha P.I.**
3. **Modern Economic Theory – Dewett.K.K.**

JOURNALS

1. **Journal of Business Economics and Management:**
2. **The IUP Journal of Managerial Economics -**

E-LEARNING RESOURCES:

1. <https://courses.lumenlearning.com>
2. <https://nitesoftsolutions.com>
3. <https://www.wisdomjobs.com>
4. <https://www.edupristine.com> ›
5. <https://ceopedia.org>

COURSE OUTCOME:

1. **Understanding pricing methods for different types of products**
2. **Give an insight to profit management and relevant theoretical back ground**
3. **Impart understanding profit policy and planning in business situations**
4. **Impart the knowledge on significance of capital budgeting in business situations**
5. **Realising the role of project evaluation techniques in estimating the feasibility of projects**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

ECONOMIC DEVELOPMENT OF TAMILNADU

TOTAL HOURS:75
CREDITS: 5

COURSE CODE: 171318
L-T-P:

LEARNING OBJECTIVES:

1. To enable the students to understand the geographical features of tamilnadu
2. To enable the students o to understand the process of growth pf Population in Tamil Nadu
3. To impart knowledge on land use of pattern in agriculture and growth of major industries

COURSE OUTLINE:

- UNIT-I** **The Geographical Features of TamilNadu – Natural Resources in TamilNadu: Land, Forest, Water, Fisheries and Minerals – Relevance of Regional Economics**
(15 Hours)
- UNIT- II** **Growth of Population in TamilNadu – Trends in State Income – Sectoral Contribution**
(15 Hours)
- UNIT- III** **Agriculture – Land use – Cropping Pattern – Agricultural Productivity - Agricultural Marketing – Agricultural Credit – Industries – Major industries – Cement – Sugar – Small and Cottage Industries – Industrial Finance**
(15 Hours)
- UNIT- IV** **Energy – Power – Transport – Communication and Banking - State Finance – Self Help – Groups**
(15 Hours)
- UNIT- V** **Social Inputs in Developmental Efforts – Education, Health and Nutrition – Drinking Water – Housing – Evaluation of Poverty alleviation Programmes in TamilNadu**
(15 Hours)

RECOMMENDED BOOKS:

1. TamilNadu Economy Dr.M.Naganathan
2. TamilNadu Economy Dr .S.PerumalSwamy

REFERENCE BOOKS:

TamilNadu Economy

Dr.Leonard

JOURNALS:

1. Research Journal - Tamilnadu Scientific Research
2. TNAU Journals

E-LEARNING RESOURCES

1. <https://www.thisismyindia.com › tamil-nadu › tamil-nadu-geography>
2. <https://www.ibef.org › States › Tamil Nadu>
3. <https://www.investindia.gov.in>
4. <https://ageconsearch.umn.edu>
5. <https://m.economictimes.com › Industry › Energy>

COURSE OUTCOME:

1. Enables students to know the geographical features of Tamilnadu
2. Make the students to analyse land use pattern in Tamilnadu
3. Analyse the nature of growth of major industries in Tamilnadu
4. Examine the energy use pattern and other sectors of the economy
5. Enables to understand the issues related to water, transport and other social inputs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

B.COM SEMESTER I

BUSINESS ECONOMICS – I

TOTAL HOURS:75

COURSE CODE: 173091

CREDITS: 5

L-T-P:

COURSE OBJECTIVES:

4. To help the students to understand the basic concepts of Business economics
5. To help the learners to have idea of concepts of demand and supply.
6. To understand and analyse the consumer behaviour pattern

COURSE OUTLINE:

UNIT-I

Introduction to Business Economics - Objectives - Nature and Scope of Business economics - Concepts of Business Economics - Opportunity Cost - Accounting Profit and Economic Profit - Incremental and Marginal Concepts - Discounting Principles.

(15 Hours)

UNIT-II

Demand Analysis – Meaning - Determinants - Law of Demand - Elasticity of Demand - Types of Elasticity of Demand - Measurement of Elasticity of Demand - Importance of Elasticity of Demand.

(15 Hours)

UNIT-III

Utility Analysis - Meaning - The Law of Diminishing Marginal Utility - Indifference Curve Analysis - Properties of Indifference Curve Analysis - Break-Even Analysis.

(15 Hours)

UNIT-IV

Demand Forecasting- Meaning - Objectives- Importance - Types and Measurement of Demand Forecasting

(15 Hours)

UNIT-V

Production - Production Function - The Law of Variable Proportions - Economies of Scale - Law of Returns to Scale.

(15 Hours)

RECOMMENDED BOOKS:

1. BUSINESS ECONOMICS- S. SANKARAN
2. MICRO ECONOMICS – M.L. JHINGAN

REFERENCE BOOKS:

1. Business Economics, K.P.M Sundaram and E.N. Sundaram, Sultan & Chand, New Delhi.
2. Managerial Economics, R. L. Varshney and K.L. Maheshwari, Sultan & Chand, New Delhi

3. **Business Economics, H.L. Ahuja, S.Chand.**
4. **Business Economics – Radha**
5. **Business Economics – Arya Mala**

JOURNALS

1. **The American Economic Review**
2. **The Economic Journal**
3. **Studies in Micro Economics**
4. **The RAND journal of Economics**

E- LEARNING RESOURCES

1. <http://www.economicdiscussion.net>
2. <https://www.economicsonline.co.uk/>
3. <http://www.sakshieducation.com/Story.aspx?nid=104613>
4. https://www.tutorialspoint.com/managerial_economics/cost_and_breakeven_analysiss.html
5. <https://www.tcd.ie/Economics/assets/pdf/MScEPS/UnderstandingMkts>

COURSE OUTCOME:

6. **To equip the students with micro economic theories with graphic illustrations.**
7. **To develop the skills of analysis of consumer behaviour with theoretical background**
8. **Understand the basic market variables that influence consumers and producers**
9. **Understand the ordinal measurement of consumer behaviour towards equilibrium**
10. **Understand the theoretical and practical background of Production**

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3
CO2	3	3	3	3	3
CO3	3	3	2	2	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	2.8	2.8

SEMESTER II

BUSINESS ECONOMICS – II

TOTAL HOURS:75

COURSE CODE: 173092

CREDITS: 5

L-T-P:

COURSE OBJECTIVES:

6. To explain the basic concepts of scarcity and opportunity cost;
7. To enumerate the forces of demand and supply and how they interact to determine an equilibrium price;
8. To explain how and why equilibrium prices might change and their impact on resource allocation;
9. To Explain the theory of the firm;
10. To Explain the theoretical market structures of perfect competition and monopoly

COURSE OUTLINE:

UNIT-I

Cost and Revenue Analysis - Various types of Costs - Average Cost - Marginal Cost and their relations to each other - types of Revenues - Average Revenue and Marginal Revenue.

(15 Hours)

UNIT-II

Product pricing – Price and output determination under Perfect Competition - features- Monopoly - Monopolistic Competition.

(15 Hours)

UNIT-III

Pricing - Objectives - Importance - Methods of Pricing - Skimming Pricing - Penetration Pricing - Cost - plus pricing – Psychological Pricing – Differential Pricing.

(15 Hours)

UNIT- IV

Theories of Profit - J.B. Clark's Dynamic Theory of Profit - F.W. Hawley's Risk Theory of Profit - Knight's Uncertainty Bearing Theory of Profit - Schumpeter's Innovation Theory of Profit.

(15 Hours)

UNIT-V

National Income - Computation of National Income - Concepts of National Income - GNP - NNP - PCI - PI - Difficulties in Computing National Income.

(15 Hours)

RECOMMENDED BOOKS

1. **Business Economics, S.Sankaran, Margham Publications, Chennai**

REFERENCE BOOKS:

1. **Business Economics**, K.P.M Sundaram and E.N. Sundaram, Sultan & Chand, New Delhi.
2. **Business Economics**, S.Sankaran, Margham Publications, Chennai.
3. **Managerial Economics**, R. L. Varshney and K.L. Maheshwari, Sultan & Chand, New Delhi
4. **Business Economics**, H.L. Ahuja, S.Chand.

E -LEARNING RESOURCES:

1. <https://www.toppr.com/guides/business-economics/meaning-and-types-of-markets/concepts-of-total-revenue-average-revenue-and-marginal-revenue/>
2. https://economicsconcepts.com/price_and_output_determination_under_monopolistic_competition.htm
3. <http://www.economicsdiscussion.net/firm/pricing-strategies/8-important-pricing-strategies-adopted-by-firms>
4. <http://www.microeconomicsnotes.com/economic-theories/theories-of-profit/theories-of-profit-in-economics>
5. <http://www.economicsdiscussion.net/national-income/national-income-definitions-circular-flow-and-concepts-with-diagram>

LEARNING OUTCOME

6. Understand the concepts of cost and their applicability in business situations
7. Insights to classification of markets
8. Understand the working of perfect and imperfect market and compare with real world situations
9. Understand the theories that determine the rewards paid for the factors of production
10. Insight to significance of theoretical background and determinants of wages

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	3

II YEAR B.Com
SEMESTER III

ELEMENTS OF STATISTICS

TOTAL HOURS: 75
CREDITS: 5

COURSE CODE: 173092
L-T-P:

COURSE OBJECTIVES:

4. Provide basic knowledge of the application of statistics
5. Develop the ability to analyse and interpret data to provide meaningful information
6. Develop an ability to apply modern quantitative tools to data analysis in research

COURSE OUTLINE:

UNIT I:

Introduction: Definitions of Statistics – Functions – Importance – Limitations of Statistics. Collection of Data: Primary and Secondary data, Methods of Primary Data Collection.

(15 Hours)

UNIT II:

Classification and Tabulation – Types of Classification, Table- Meaning of Table, Parts of a good table, types of Tables and its Uses. Diagrammatic Representation of data: Bar diagram, Multiple Bar diagram, Percentage Bar diagram, Pie diagram, Histogram, Frequency Polygon, Frequency Curve or Ogive Curve and Lorenz curve.

(15 Hours)

UNIT III:

Measures of central tendency: Meaning and Definition, Uses and Limitations. Arithmetic Mean, Median, Mode. Percentiles and Deciles.

(15 Hours)

UNIT IV:

Measures of Dispersion: Absolute Measures and Relative Measures. Range, Quartile Deviation, Co-efficient of Quartile Deviation, Mean Deviation, Co-efficient of Mean Deviation, Standard deviation – Co – efficient of variation.

(15 Hours)

UNIT V:

Skewness : Meaning and Definition, Karl Pearson's co – efficient of skewness, Bowley's Co – efficient of skewness. Uses and its Limitations.

(15 Hours)

RECOMMENDED BOOKS:

1. S..P.Gupta, Elementary Statistics, Sultan Chand And Sons, New Delhi, 2007
2. R.S.N. Pillai and V. Bagavathi , Practical Statistics, S. Chand Limited, 2003.

REFERENCE BOOKS:

1. John E. Freund, Mathematical Statistics, Prentice Hall, 1992

2. Richard J. Larsen and Morris L. Marx, An Introduction to Mathematical Statistics and its Applications, Prentice Hall, 2011.
3. Crompton and Cowden, 1988, Applied General Statistics 3rd edition. Printice Hall of India Ltd.
4. Elhance D. N & B.M. Agarwal, 2003. *Fundamentals of Statistics* 17th edition, KitabMahal Agencies,

JOURNALS:

1. Journal of Applied Statistics
2. [Journal of Statistical Theory and Applications](#)

E-LEARNING RESOURCES:

1. <https://www.uq.edu.au> › student-services › learning › statistical-reference
2. <https://www.khanacademy.org> › math › statistics-probability
3. www.statsoft.com › Textbook › Basic-Statistics
4. <https://stattrek.com> › statistics
5. <https://www.worldofstatistics.org> › statistics-as-a-career

LEARNING OUTCOME

6. Students will formulate complete, concise, and correct mathematical proofs.
7. Students will frame problems using multiple mathematical and statistical representations of relevant structures and relationships and solve using standard techniques.
8. Students will create quantitative models to solve real world problems in appropriate contexts.
9. Students will clearly communicate quantitative ideas both orally and in writing to a range of audiences.
10. Students will summarise data visually and numerically.

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	3

SEMESTER IV

STATISTICAL TECHNIQUES

TOTAL HOURS:75

COURSE CODE:

CREDITS: 5

L-T-P:

COURSE OBJECTIVES:

1. Motivate in students an intrinsic interest in statistical thinking.
2. Instil the belief that Statistics is important for scientific research.
3. To develop the student's ability to deal with numerical and quantitative issues in business

COURSE OUTLINE:

		(15 Hours)
UNIT- I	Correlation: Meaning and Methods, Karl Pearson's co – efficient of correlation, Spearman's co – efficient of rank correlation.	
		(15 Hours)
UNIT- II	Regression: Definition, Methods, Regression equations of x on y and y on x. Uses and Limitations of Regression.	
		(15 Hours)
UNIT- III	Index Numbers: Meaning, uses, Weighted and Un weighted Index Numbers, Price Index and Quantity Index, Types, Laspeyer's, Pasche's, Fisher's Price and Quantity Index Numbers, Tests of ideal index number, Time Reversal and Factor Reversal Tests, Cost of living index, Uses and Limitations.	
		(15 Hours)
UNIT -IV	Time series Analysis: Definition, Components and uses of Time series- methods of calculating trend-Moving average (Three yearly, four yearly and Five yearly moving average) method of least squares	
UNIT V	Sampling : Meaning and definition- methods of sampling-advantages and disadvantages of sampling methods-importance of sampling-limitations-sampling error	
		(15 Hours)

RECOMMENDED TEXT BOOKS:

3. S..P.Gupta, Elementary Statistics, Sultan Chand And Sons, New Delhi, 2007
4. R.S.N. Pillai and V. Bagavathi, Practical Statistics, S. Chand Limited, 2003

REFERENCE BOOKS:

3. John E. Freund, Mathematical Statistics, Prentice Hall, 1992
4. Richard J. Larsen and Morris L. Marx, An Introduction to Mathematical Statistics and its Applications, Prentice Hall, 2011.

JOURNALS:

1. Journal of Applied Statistics
2. Journal of Statistical Theory and Applications

E-LEARNING RESOURCES

1. <https://www.uq.edu.au> › student-services › learning › statistical-reference
2. <https://www.khanacademy.org> › math › statistics-probability
3. www.statsoft.com › Textbook › Basic-Statistics
4. <https://stattrek.com> › statistics
5. <https://www.worldofstatistics.org> › statistics-as-a-career

LEARNING OUTCOME

1. Students will formulate complete, concise, and correct mathematical proofs.
2. Students will frame problems using multiple mathematical and statistical representations of relevant structures and relationships and solve using standard techniques.
3. Students will create quantitative models to solve real world problems in appropriate contexts.
4. Students will clearly communicate quantitative ideas both orally and in writing to a range of audiences.
5. Students will summarise data visually and numerically.

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	3

B.COM (CORPORATE SECRETARYSHIP)
SEMESTER I

BUSINESS ECONOMICS – I

TOTAL HOURS:75

COURSE CODE: 183191

CREDITS: 5

L-T-P:

COURSE OBJECTIVES:

7. To help the students to understand the basic concepts of Business economics
8. To help the learners to have idea of concepts of demand and supply.
9. To understand and analyse the consumer behaviour pattern

COURSE OUTLINE:

UNIT-I

Definition- Scope and importance of Business Economics- Meaning- Business Economics and Economic Theory- Types of Business Decision, Price Output decision-Demand Decision-, Advertising Decision- Investment Decision- Difference between Micro and Macro Economics.

(15 Hours)

UNIT –II

Law of demand-meaning- why does demand curve slopes downward- determinants of demand- law of diminishing marginal utility.supply concept and equilibrium

(15 Hours)

UNIT-III

Elasticity of Demand - Measurement of Elasticity of Demand . Demand Forecasting- - Methods of Demand Forecasting – New Product- forecasting methods.

(15 Hours)

UNIT-IV

Cost Classification- Short run cost and Long run cost- Break-Even Analysis.

(15 Hours)

UNIT-V

Product pricing- price and output determination under perfect competition-monopoly-discriminating monopoly- monopolistic and oligopoly competition

(15 Hours)

RECOMMENDED BOOKS:

3. BUSINESS ECONOMICS- S. SANKARAN
4. MICRO ECONOMICS – M.L. JHINGAN

REFERENCE BOOKS:

6. Business Economics, K.P.M Sundaram and E.N. Sundaram, Sultan & Chand, New Delhi.
7. Managerial Economics, R. L. Varshney and K.L. Maheshwari, Sultan & Chand, New Delhi
8. Business Economics, H.L. Ahuja, S.Chand.
9. Business Economics – Radha
10. Business Economics – Arya Mala

JOURNALS

1. The American Economic Review
2. The Economic Journal
3. Studies in Micro Economics
4. The RAND journal of Economics

E- LEARNING RESOURCES

1. <http://www.economicdiscussion.net>
2. <https://www.economicsonline.co.uk/>
3. <http://www.sakshieducation.com/Story.aspx?nid=104613>
4. https://www.tutorialspoint.com/managerial_economics/cost_and_breakeven_analyses.html
5. <https://www.tcd.ie/Economics/assets/pdf/MScEPS/UnderstandingMkts>

COURSE OUTCOME:

1. To equip the students with micro economic theories with graphic illustrations.
2. To develop the skills of analysis of consumer behaviour with theoretical background
3. Understand the basic market variables that influence consumers and producers
4. Understand the ordinal measurement of consumer behaviour towards equilibrium
5. Understand the theoretical and practical background of Production

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3
CO2	3	3	3	3	3
CO3	3	3	2	2	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	2.8	2.8

SEMESTER II

MARKETING

TOTAL HOURS:75

COURSE CODE: 183192

CREDITS: 5

L-T-P:

COURSE OBJECTIVES

- 1. To provide an understanding of major aspects of planning and execution of marketing operation**
- 2. To elucidate various kinds of marketing strategies**
- 3. To understand the marketing distribution system**

COURSE OUTLINE:

UNIT I

Nature scope and significance of marketing-types-modern marketing-marketing mix-marketing process-functions of marketing.

(15 Hours)

UNIT II

Product -brand-labeling-packaging -importance-product life cycle-new product development-product diversification-product elimination

(15 Hours)

UNIT III

Pricing -objectives-importance-types

(15 Hours)

UNIT IV

Physical distribution-marketing structure-wholesalers-retailers-middlemen.

(15 Hours)

UNIT V

Promotion-personal selling -advertising -sales forecast- E -marketing

(15 Hours)

RECOMMENDED BOOKS:

3. Marketing- Dr. N. Rajan Nair
4. Modern Marketing- R.S.N. Pillai & Bhagawathi

REFERENCES BOOKS:

3. Marketing - Philip Kotler
4. Modern Marketing – Kathiresan & Radha

JOURNALS:

- Journal of Marketing Research: SAGE Journals
- Indian Journal of Marketing

E-LEARNING RESOURCES

- <https://www.gc-solutions.net> › solutions › sales-marketing-trainings
- <https://marketinginsidergroup.com> ›
- <https://marketinginsidergroup.com> ›
- <https://www.marketing-strategies-and-ideas.com>
- <https://www.marketingteacher.com>

COURSE OUTCOME

6. Gains an insight to definition of marketing and its significance
7. Understand different process of buying and selling
8. Gives an idea of standardisation and grading of commodities
9. Provides knowledge of different aspects of pricing of goods
10. Orientation in marketing research

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	2	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	3

SEMESTER III

BUSINESS STATISTICS I

TOTAL HOURS:75

COURSE CODE: 183193

CREDITS: 5

L-T-P:

COURSE OBJECTIVES

7. Provide basic knowledge of the application of statistics
8. Develop the ability to analyse and interpret data to provide meaningful information
9. Develop an ability to apply modern quantitative tools to data analysis in research

COURSE OUTLINE:

UNIT I:

Introduction: Definitions of Statistics – Functions – Importance – Limitations of Statistics. Collection of Data: Primary and Secondary data, Methods of Primary Data Collection.

(15 Hours)

UNIT II:

Classification and Tabulation – Types of Classification, Table- Meaning of Table, Parts of a good table, types of Tables and its Uses.

(15 Hours)

UNIT III:

Diagrammatic Representation of data: Bar diagram, Multiple Bar diagram, Percentage Bar diagram, Pie diagram, Histogram, Frequency Polygon, Frequency Curve or Ogive Curve.

UNIT IV:

Measures of central tendency: Mean, Median, Mode.

(15 Hours)

UNIT V:

Measures of Dispersion: Quartile Deviation, Mean Deviation, Co-efficient of Mean Deviation, Standard- Skewness -Bowley's Method- Karl pearson method

RECOMMENDED BOOKS:

3. S..P.Gupta, Elementary Statistics, Sultan Chand And Sons, New Delhi, 2007
4. R.S.N. Pillai and V. Bagavathi , Practical Statistics, S. Chand Limited, 2003.

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JOURNALS:

1. Journal of Applied Statistics
2. Journal of Statistical Theory and Applications

E-LEARNING RESOURCES:

1. <https://www.uq.edu.au> › student-services › learning › statistical-reference
2. <https://www.khanacademy.org> › math › statistics-probability
3. www.statsoft.com › Textbook › Basic-Statistics
4. <https://stattrek.com> › statistics
5. <https://www.worldofstatistics.org> › statistics-as-a-career

LEARNING OUTCOME

11. Students will formulate complete, concise, and correct mathematical proofs.
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15. Students will summarise data visually and numerically.

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	3

STATISTICAL TECHNIQUES

TOTAL HOURS:75

COURSE CODE: 183194

CREDITS: 5

L-T-P:

COURSE OBJECTIVES:

4. Motivate in students an intrinsic interest in statistical thinking.
5. Instil the belief that Statistics is important for scientific research.
6. To develop the student's ability to deal with numerical and quantitative issues in business

COURSE OUTLINE:

	(15 Hours)
UNIT- I	Correlation: Meaning and Methods, Karl Pearson's co – efficient of correlation, Spearman's co – efficient of rank correlation.
	(15 Hours)
UNIT- II	Regression: Definition, Methods, Regression equations of x on y and y on x. Uses and Limitations of Regression.
	(15 Hours)
UNIT- III	Index Numbers: Meaning, uses, Weighted and Un weighted Index Numbers, Price Index and Quantity Index, Types, Laspeyer's, Pasche's, Fisher's Price and Quantity Index Numbers, Tests of ideal index number, Time Reversal and Factor Reversal Tests
	(15 Hours)
UNIT -IV	Time series Analysis: Definition, Components and uses of Time series- methods of calculating trend-Moving average – ratio to moving average method- ratio to trend method
	(15 Hours)
UNIT V	Probability – introduction- addition and multiplication theorem
	(15 Hours)

RECOMMENDED TEXT BOOKS:

5. S..P.Gupta, Elementary Statistics, Sultan Chand And Sons, New Delhi, 2007

6. **R.S.N. Pillai and V. Bagavathi, Practical Statistics, S. Chand Limited, 2003**

REFERENCE BOOKS:

5. **John E. Freund, Mathematical Statistics, Prentice Hall, 1992**
6. **Richard J. Larsen and Morris L. Marx, An Introduction to Mathematical Statistics and its Applications, Prentice Hall, 2011.**

JOURNALS:

1. Journal of Applied Statistics
2. Journal of Statistical Theory and Applications

E-LEARNING RESOURCES

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3. www.statsoft.com › Textbook › Basic-Statistics
4. <https://stattrek.com> › statistics
5. <https://www.worldofstatistics.org> › statistics-as-a-career

LEARNING OUTCOME

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CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	3

QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMEN
(Autonomous) Chennai – 600 002.

PG AND RESEARCH DEPARTMENT OF MATHEMATICS

SYLLABUS
(For PG COURSE)



CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION
(OFFERED FROM THE ACADEMIC YEAR 2018-19)

CONTENTS

Rules and regulations for the Programme

Programme Educational objectives

Programme outcomes

Programme specific outcomes

Programme profile

Evaluation pattern of CA

Rubrics for CA Evaluation

Evaluation pattern for End Semester

Course profile semester I

Course profile semester II

Course profile semester III

Course profile semester IV

Course profile semester V

Course profile semester VI

Course outline

RULES AND REGULATIONS FOR PG PROGRAMME

1. Duration

- c. There will be two semesters in each academic year. The first academic year shall comprise of the first & second semesters, the second academic year, the third & fourth semesters.
- d. The odd semester shall consist of the period from June to November of each year & the even semester from December to April of each year.

2. Course of Study

- c. The course of study for post graduate degree course shall comprise of Core courses & Electives.
- d. System of credits

Year	No. of Papers				Marks	Credits				
	Core	Elective	Extra-Disciplinary Elective	Soft Skill		Core	Elective	Extra-Dis. Elective	Soft Skill	Internship
I Year	7	3	1	2	1300	28	9	3	4	2
II Year	8	2	1	2	1300	32	6	3	4	
Total	15	5	2	4	2600	60	15	6	8	2

3. Passing Minimum

A candidate shall be declared to have passed in each paper/practical of the main subject of study wherever prescribed if she secures NOT LESS THAN 50% of the marks prescribed for the examinations. She shall be declared to have passed the whole examination, if she passes in all papers & practicals wherever prescribed as per the scheme of examinations earning 90 credits.

4. Eligibility for the Award of Degree

Candidates must secure a minimum of 50% marks in the Semester End Examinations. A candidate must secure 8 credits in soft skills and 2 credits in internship in addition to 90 credits from core and elective courses to obtain a Post Graduate Degree.

5. Ranking

Candidates who pass all the examinations prescribed for the course in the **FIRST APPEARANCE ALONE** are eligible for Classification/ Ranking/ Distinction.

6. Distribution of Marks for Continuous Assessment

Test			Best 2 out of 3	Assignment	Seminar / Creative Presentation	Model Exam	Attendance	Total	Reduced to
20	20	20	40	10	15	25	10	100	25

Test (Best two out of three) : 40 Marks

Assignment / Seminar /

Creative Presentation : 25 Marks

Model Examination : 25 Marks

Attendance

90 – 100% - 10 Marks

80 – 89% - 9 Marks

75 – 79% - 8 Marks

65 – 74% - 7 Marks

55 – 64% - 5 Marks

Below 55% - 0 – Not Eligible

Program Outcomes(PO)

The post Graduate students of Mathematics should be able to

1. PO1 – Apply computational knowledge.
2. PO2 – Identify quality research.
3. PO3 – Design own curriculum to face competitive world
4. PO4 – Acquire tremendous subject knowledge of the subject.
5. PO5 – Demonstrate quality skills.

Program Specific Outcomes(PSO)

The post Graduate students of Mathematics should be able to

1. PSO1 - Mastering the ideas and techniques of abstract and algebraic analysis.
2. PSO2 - Learning the extension of Abstract Algebra, Differential Equations and Probability.
3. PSO3 - Gaining a good understanding of a few major realms of pure and applied mathematics.
4. PSO4 – Have a solid knowledge on Statistics.
5. PSO5 – Understand the applications of Operations Research in real life.
6. PSO6 - Gain knowledge about the basic computer applications and communication skills.
7. PO7 – Acquire tremendous subject knowledge of the subject and demonstrate quality skills.

PROGRAMME PROFILE – M.Sc MATHEMATICS

SEM	PART	COURSE CODE	TITLE OF THE PAPER	CREDIT S	HOUR S/WK	TOTAL HOURS	CA	SE	TOTAL
I	III	176101	Algebra I	4	6	90	25	75	100
I	III	176102	Real analysis I	4	6	90	25	75	100
I	III	176103	Graph Theory	4	6	90	25	75	100
I	III	176104	One from the list of 13 Electives Mathematical Statistics	3	5	75	25	75	100
I	III	176105	One from the list of 12 Electives Number Theory and Cryptography	3	5	75	25	75	100
I	IV	175001	Seminar/Library/Soft Skills	2	2	30	40	60	100
II	III	176106	Algebra II	4	5	75	25	75	100
II	III	176107	Real analysis II	4	5	75	25	75	100
II	III	176108	Ordinary Differential Equations	4	5	75	25	75	100
II	III	176109	Object Oriented Programming with C++ (Theory)	4	5	75	25	75	100
II	III	176110	One from the list of 11 Electives Object Oriented Programming with C++ (Practical)	3	5	75	25	75	100
II	III	176111	Quantitative Aptitude	3	3	45	25	75	100
II	IV	175002	Seminar/Library/Soft Skills LSR W Skills for Effective Communication	2	2	30	40	60	100
III	III	176112	Topology	4	5	75	25	75	100
III	III	176113	Differential Geometry	4	5	75	25	75	100
III	III	176114	Mechanics	4	5	75	25	75	100
III	III	176115	Discrete Mathematics	4	5	75	25	75	100
III	III	176116	One from the list of 10 Electives Mathematical Programming	3	5	75	25	75	100
III	III	176117	Data Analysis	3	3	45	25	75	100
III	IV	175003	Seminar/Library/Soft Skills	2	2	30	40	60	100
IV	III	176118	Complex Analysis	4	6	90	25	75	100

IV	III	176119	Functional Analysis	4	6	90	25	75	100
IV	III	176120	Resource Management Techniques	4	6	90	25	75	100
IV	III	176121	Project Work & Viva – Voce (75+25)	4	5	90	25	75	100
IV	III	176122	One from the list of 9 electives Fluid Dynamics	3	5	90	25	75	100
IV	IV	175004	Seminar/Library/Soft Skills	2	2	30	40	60	100
IV	IV	175005	Internship to be completed before IV semester	2			25	75	100

	List of Electives
1	Number Theory and Cryptography
2	Mathematical Statistics
3	Object Oriented Programming with C++ (Practical)
4	Fluid Dynamics
5	Mathematical Programming
6	Analytic Number Theory
7	Formal Languages & Automata Theory
8	Java Programming
9	Financial Mathematics
10	Accounting Principles & E-commerce
11	Relational Data Base Management Systems
12	Data Structures & Algorithms
13	Partial Differential Equations

EVALUATION PATTERN FOR CONTINUOUS ASSESSEMENT – PG

INTERNAL VALUATION BY COURSE TEACHER/S

PART I, II AND III – THEORY PAPERS

COMPONENT	TIME	MAX.MARKS	CA MARK
1. TEST I	1 HR	25 MARKS (TO BE CONVERTED)	20
2. TEST II	1 HR	25 MARKS (TO BE CONVERTED)	20
3. MODEL EXAMINATION	3 HR	75 MARKS (TO BE CONVERTED)	25
4. ASSIGNMENT/SEMINAR/FIELD VISIT			25
5. ATTENDANCE			10
		TOTAL	100

PART III – PRACTICAL PAPERS

COMPONENT	TIME	MAX.MARKS	CA MARK
1. TEST I	1 HR	25 MARKS (TO BE CONVERTED)	20
2. TEST II	1 HR	25 MARKS (TO BE CONVERTED)	20
3. MODEL EXAMINATION	3 HR	75 MARKS (TO BE CONVERTED)	25
4. ASSIGNMENT/SEMINAR/FIELD VISIT			25
5. ATTENDANCE			10
		TOTAL	100

PART IV – SKB/SOFT SKILLS

COMPONENT	TIME	MAX.MARKS	CA MARK
1. TEST I	1 HR	20(TO BE CONVERTED)	10
2. ASSIGNMENT		10	10
3. PRESENTATION SKILLS		20	20
		TOTAL	40

CA QUESTION PAPER PATTERN – PG

Knowledge Level	Section	Word Limit	Marks	Total
K1	A-5/6X2 Marks	50	10	25
K1,K2	B-1/2X5 Marks	200	5	
K2,K3	C-1/2X10 Marks	500	10	

CA QUESTION PAPER PATTERN FOR PART IV – PG

Knowledge Level	Section	Word Limit	Marks	Total
K2,K3	A-4/5X5 Marks	500	20	20

RUBRICS FOR CONTINUOUS ASSESSMENT

Assignment	Content/originality/Presentation/Schematic Representation and Diagram/Bibliography
Seminar	Organisation/Subject Knowledge/ Visual Aids/ Confidence level/presentation – Communication and Language
Field Visit	Participation/Preparation/Attitude/Leadership
Participation	Answering Questions/ Clearing Doubts/ Participating in Group Discussions/ Regular Attendance
Case Study	Finding the problem/ analysis/ Solution/ Justification
Problem Solving	Understanding Concepts/ Formula and variable Identification / Logical Sequence/ Answer
Group Discussion	Preparation/ Situation Analysis/ Relationship Management/ Information Exchange/ Delivery skills
Flipped/ blended Learning	Preparation/ Information Exchange/ Group interaction/ Clearing doubts

END SEMESTER EVALUATION PATTERN – PG

THEORY PAPERS

PART III

SEMESTER I/II/III/IV/V/VI

DOUBLE VALUATION BY COURSE TEACHER AND EXTERNAL EXAMINER

MAXIMUM MARKS: 75

PASSING MARK: 30

PRACTICAL PAPERS

SEMESTER I/II/III/IV

DOUBLE VALUATION BY COURSE TEACHER AND EXTERNAL EXAMINER

MAXIMUM MARKS: 75

PASSING MARK: 30

SOFT SKILLS PAPERS

SEMESTER I/II/III/IV

SINGLE VALUATION BY COURSE TEACHER

MAXIMUM MARKS:60

PASSING MARK: 30

PROJECT PAPER

SEMESTER:IV

DISSERTATION: 75

VIVA: 25

MAXIMUM MARKS: 100

PASSING MARKS:50

INTERNSHIP

YEAR II

SEMESTER III and IV

SEMESTER I COURSE PROFILE – PROGRAMME OF STUDY - PG

COURS E CODE	TITLE OF THE PAPER	CREDIT S	HOURS / WK	TOTA L HOUR S	L-T-P	CA	SA	TOT AL
176101	Algebra I	4	6	90	4-2-0	25	75	100
176102	Real analysis I	4	6	90	4-2-0	25	75	100
176103	Graph Theory	4	6	90	4-2-0	25	75	100
176104	One from the list of 13 Electives Mathematical Statistics	3	5	75	4-1-0	25	75	100
176105	One from the list of 12 Electives Number Theory and Cryptography	3	5	75	4-1-0	25	75	100
175001	Seminar/Library/Soft Skills	2	2	30	2-0-0			
	TOTAL							
	TOTAL CREDITS	20						

SEMESTER II COURSE PROFILE – PROGRAMME OF STUDY - UG

COURS E CODE	TITLE OF THE PAPER	CREDIT S	HOUR S/ WK	TOTA L HOUR S	L-T-P	CA	SA	TO TA L
176106	Algebra II	4	5	75	4-1-0	25	75	100
176107	Real analysis II	4	5	75	4-1-0	25	75	100
176108	Ordinary Differential Equations	4	5	75	4-1-0	25	75	100
176109	Object Oriented Programming with C++ (Theory)	4	5	75	4-1-0	25	75	100
176110	One from the list of 11 Electives Object Oriented Programming with C++ (Practical)	3	5	75	4-1-0	25	75	100
176111	Quantitative Aptitude	3	3	45	2-1-0	25	75	100
175002	Seminar/Library/Soft Skills	2	2	30	2-0-0			
	TOTAL							
	TOTAL CREDITS	24						

SEMESTER III COURSE PROFILE – PROGRAMME OF STUDY - PG

COURS E CODE	TITLE OF THE PAPER	CREDI TS	HOUR S/ WK	TOTA L HOUR S	L-T-P	CA	SA	TOT AL
176112	Topology	4	5	75	4-1-0	25	75	100
176113	Differential Geometry	4	5	75	4-1-0	25	75	100
176114	Mechanics	4	5	75	4-1-0	25	75	100
176115	Discrete Mathematics	4	5	75	4-1-0	25	75	100
176116	One from the list of 10 Electives Mathematical Programming	3	5	75	4-1-0	25	75	100
176117	Data Analysis	3	3	45	2-1-0	25	75	100
175003	Seminar/Library/Soft Skills	2	2	30	2-0-0	40	60	100
	TOTAL							
	TOTAL CREDITS	24						

SEMESTER IV COURSE PROFILE – PROGRAMME OF STUDY - PG

COURS E CODE	TITLE OF THE PAPER	CREDIT S	HOURS / WK	TOTA L HOUR S	L-T-P	CA	SA	TO TA L
176118	Complex Analysis	4	6	90	4-2-0	25	75	100
176119	Functional Analysis	4	6	90	4-2-0	25	75	100
176120	Resource Management Techniques	4	6	90	4-2-0	25	75	100
176121	Project Work & Viva – Voce (75+25)	4	5	75	4-1-0	25	75	100
176122	One from the list of 9 electives Fluid Dynamics	3	5	75	4-1-0	25	75	100
175004	Seminar/Library/Soft Skills	2	2	30	2-0-0	40	60	100
175005	Internship to be completed before IV semester	2				25	75	100
	TOTAL							
	TOTAL CREDITS	23						

Courses outlines -PG

SEMESTER I

ALGEBRA I

TOTAL HOURS: 90

CREDITS: 4

COURSE CODE: 176101

L-T-P: 4-2-0

COURSE OBJECTIVES:

1. To introduce the basic concepts of algebra
2. To acquire knowledge of Sylow's theorem and its applications.
3. To develop working knowledge of Groups, Normal Subgroups, Automorphism groups, Finite groups, Rings and integral domain.
4. To analyze Permutation groups and fundamentals of counting principle.
5. To understand Trace and transpose.

COURSE OUTLINE:

Unit 1:	Another counting principle – class equation for finite groups and its applications – Sylow's theorems (For theorem 2.12.1, First Proof only). Chapter 2: Sections 2.11 and 2.12 (Omit Lemma 2.12.5)	18 hours
Unit 2:	Solvable groups – Direct Products – Finite abelian groups Chapter 5: Section 5.7 upto theorem 5.7.1. Chapter 2: Section 2.13 and 2.14 (Theorem 2.14.1 only)	18 hours
Unit 3:	Polynomial Rings, Polynomials over the rational field, Polynomials over commutative rings. Chapter 3: 3.9, 3.10, 3.11	18 hours
Unit 4:	Modules – Linear Transformation – Nilpotent transformations Chapter 4: 4.5 Chapter 6: Sections 6.4, 6.5.	18 hours
Unit 5:	Trace and transpose – Hermitian, Unitary, Normal transformation, real quadratic form. Chapter 6: Sections 6.8, 6.10 and 6.11 (Omit 6.9)	18 hours

RECOMMENDED TEXT BOOK :

1. Topics in Algebra (II Edition), I.N. Herstein Wiley Eastern Ltd, New Delhi, 1975.
2. I.S.Luther and I.B.S.Passi, Algebra, Vol. I –Groups(1996); Vol. II Rings, Narosa Publishing House, New Delhi, 1999.

BOOKS FOR REFERENCE:

1. Basic Abstract Algebra (II Edition) , P.B. Bhattacharya, S.K. Jain, and S.R. Nagpaul, Cambridge University Press, 1997. (Indian Edition).

2. Fundamentals of Abstract Algebra, D.S. Malik, J.N. Mordeson and M.K. Sen, McGraw Hill (International Edition), New York, 1997.
3. Basic Algebra, N. Jacobson, Vol. I & II W.H. Freeman (1980); also published by Hindustan Publishing Company, New Delhi.
4. M. Artin, Algebra, Prentice Hall of India, 1991.

JOURNALS:

1. International journal of Algebra and computation
<https://www.worldscientific.com/worldscinet/ijac>
2. International journal of pure and applied mathematics
www.springer.com/mathematics/journal/13226

E-LEARNING RESOURCES:

1. <https://www.wikipedia>classicalalgebra>
2. <https://elearningk12.com>
3. <https://www.futureschool.com>
4. <https://www.mathplanet.com>algebra>
5. <https://www.khanacademy.org>algebra>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Identify the concept of counting principle, sylow's theorem
CO 2	Analyze solvable groups and finite abelian groups
CO 3	Provide information on polynomials
CO 4	Discuss modules and various transformations
CO 5	Compute various quadratic forms

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2.2	2.2

SEMESTER I
REAL ANALYSIS - I

TOTAL HOURS: 90

COURSE CODE: 176102

CREDITS: 4

L-T-P: 4-2-0

COURSE OBJECTIVES:

1. To know the concepts of the functions of bounded variation , Riemann-Stieltjes Integral, Riemann condition, Comparison Theorem.
2. To study about Infinite series and Infinite products, Sequence of functions.
3. To study the continuity and uniform continuity of functions.

COURSE OUTLINE:

UNIT 1: Functions of bounded variation - Introduction - Properties of monotonic functions - Total variation - Functions of bounded variation expressed as the difference of two increasing functions - Continuous functions of bounded variation.

Chapter 6 : Sections 6.1 to 6.8

Hours: 18Hrs

UNIT 2 The Riemann - Stieltjes Integral - Integration by parts, Change of variable, Reduction to a Riemann Integral – Euler's summation formula - Monotonically increasing integrators, Upper and lower integrals - Riemann's condition - Comparison theorems.

Chapter - 7 : Sections 7.1 to 7.14

Hours: 18Hrs

UNIT 3 The Riemann-Stieltjes Integral - Integrators of bounded variation- Mean value theorems for Riemann - Stieltjes integrals - The integrals as a function of the interval - Second fundamental theorem of integral calculus-Change of variable in a Riemann integral- Second Mean Value Theorem

Chapter - 7 : 7.15 to 7.22

Hours: 18Hrs

UNIT 4 Infinite Series : Absolute and conditional convergence - Dirichlet's test and Abel's test - Infinite Series and infinite Products - Double sequences - Double series – Rearrangement theorem for double series -- Multiplication of series - Cesaro summability - Infinite products, Power series , Taylor's series generated by a function - Bernstein's theorem - Abel's limit theorem.

Chapter 8 : Sections 8.8, 8.15, 8.20 to 8.26.

Hours: 18Hrs

UNIT 5: Sequences of Functions - Uniform convergence and related theorems.

Chapter 9: Section 9.1 to 9.6, 9.8, 9.10, 9.11, 9.14, 9.15, 9.19, 9.20, 9.22

Hours: 18Hrs

RECOMMENDED TEXTBOOKS:

1. Mathematical Analysis, **Tom M. Apostol** : 2nd Edition, Addison-Wesley Publishing Company Inc. New York, 1974.

REFERENCE BOOKS:

1. W. Rudin, Principles of Mathematical Analysis McGraw Hill Book Co, 1976.
2. R.G. Bartle, The Elements of Real Analysis, 2nd Ed., J. Wiley, NY, London, 1964.
3. R.R. Goldberg, Methods of Real Analysis, Wiley, 1976.
4. Kenneth A. Ross, Elements of Analysis: The Theory of Calculus, Springer Verlag, UTM, 1980.
5. H.L. Royden, Real Analysis, Macmillan Publ. Co. Inc. 4th edition, New York, 1993.
6. V. Ganapathy Iyer, Mathematical Analysis, Tata McGraw Hill, New Delhi, 1970.
7. S. R. Ghorpade and B. V. Limaye, Introduction to Calculus and Real Analysis, Springer, 2006.

JOURNALS:

1. Borwein D: Theorems on some methods of summability. Q. J. Math. 1958, 9: 310–316.
10.1093/qmath/9.1.310
2. On the absolute Cesàro summability factors of infinite series. Z. U. Ahmad.
1961, Volume 76, Issue 1, pp 295–310

E-LEARNING RESOURCES:

<http://mathforum.org>,

<http://ocw.mit.edu/ocwweb/Mathematics>,

<http://www.opensource.org>,

www.mathpages.com

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand and would have the knowledge of functions of bounded variation.
CO 2	Analyze the differences between Riemann Integral and Riemann-Stieltjes Integral.
CO 3	Able to find limit superior and limit inferior of the Real valued sequences and to find the value of Infinite series and Infinite Products.
CO 4	Able to understand Bernstein's Theorem.
CO 5	Able to understand the continuity and uniform continuity of functions.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	2	3
CO 2	2	3	2	2	3

CO 3	2	3	2	2	3
CO 4	2	2	2	2	2
CO 5	2	3	3	3	2
AVERAGE	2	3	2	2	3

**SEMESTER-I
GRAPH THEORY**

Total Hours: 90

Code:176103

Credits: 5

Course

L-T-P: 4-2-0

COURSE OBJECTIVES:

1. To understand and apply the fundamental concepts in graph theory
2. To apply graph theory based tools in solving practical problems
3. Study of graph theory helps in relating real life situations such as linking bridges and islands, the highways and the set of cities, or the pages of the web.
4. Study of transportation and communication networks are two obvious areas of application of graph theory.
5. Study of graphs helps in modelling any network, conceptual or physical.

COURSE OUTLINE:

Unit 1:

Colourings of graphs: Edge colourings, edge chromatic number. Vizing's theorem. Time tabling problem, Independent sets and cliques, Ramsey's theorem, Turan's theorem

Chapter 6: Sections 6.1 to 6.3

Chapter 6: Sections 7.1 to 7.3

Hours: 18Hrs

Unit 2:

Vertex colourings: Chromatic number, Brook's theorem, Hajo's conjecture, Chromatic polynomials, girth and chromatic number, storage problem.

Chapter 8: Sections 8.1 to 8.6

Hours: 18Hrs

Unit 3:

Planar graphs: plane, planar, dual graphs, Euler's formula, Five colour theorem and Four colour conjecture

Chapter 9: Sections 9.1 to 9.3 and 9.6

Hours: 18Hrs

Unit 4:

Directed graphs: directed paths, directed cycles, applications: job sequencing problem, making a road system one-way

Chapter 10: Sections 10.1 to 10.4, 10.6

Hours: 18Hrs

Unit 5:

Networks: Flow, cuts, the max-flow min-cut theorem, applications: Menger's theorem

Chapter 11: Sections 11.1 to 11.4

Hours: 18Hrs

RECOMMENDED TEXTBOOKS:

1. "Graph theory with applications" by J.A. Bondy and U.S.R. Murthy, the MacMillan Press Ltd., Publications 1976.

BOOK FOR REFERENCE:

1. Introduction to graph theory, Douglas B. West, Prentice, Hall of India Private limited, New Delhi, 1999.
2. "Graph Theory-Modeling, Applications and Algorithms" by Agnarsson and Greenlaw, Pearson Education, Inc., New Delhi, 2007.
3. Graph Theory with Applications to Engineering and Computer Science, Narsingh Deo, Prentice Hall India Learning Private Limited; New edition 1979.
4. A Textbook of Graph Theory, R. Balakrishnan and K. Ranganathan, Springer Publications, New York, 2012.
5. J. A. Bondy and U. S. R. Murty, Graph Theory: An Advanced Course, Graduate Texts in Mathematics 244 (Springer--Verlag, 2007).
6. R. Diestel, Graph Theory, Graduate Texts in Mathematics 173 (third edition, Springer-Verlag, 2005).

JOURNALS:

1. The Journal of Graph Theory
2. The Journal of Graph Algorithms and Applications (JGAA).

E-LEARNING SOURCES:

1. CS798: Mathematical Foundations of Computer Networking.
2. MIT OpenCourseware, Graph Theory ++ math for computer science, lectures 6-10
3. University of California, San Diego, Higher School of Economics, Introduction to Graph Theory via Course 3-5 hours a week, 5 weeks long.

COURSE OUTCOMES:

CO NUMBER	CO STATEMENT
CO1	The students will be able to apply principles and concepts of graph theory in practical situations
CO2	The student will be able to formulate and prove central theorems about connectivity, colouring.
CO3	The student will be equipped with knowledge on plane graph and stereographic projections
CO4	Algorithms to find the components of a graph and the strongly connected components of a digraph.
CO5	The max flow/min cut algorithm for finding a maximum (s,t)-flow in a network.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	3	2	2	3
CO 2	3	3	2	2	3
CO 3	3	3	2	2	3

CO 4	3	2	2	2	2
CO 5	3	3	3	3	2
AVERAGE	3	3	2	2	3

SEMESTER I
MATHEMATICAL STATISTICS

TOTAL HOURS: 75

COURSE CODE: 176104

CREDITS: 5

L-T-P: 4-1-0

COURSE OBJECTIVES:

- To explore the foundations of mathematics at a level and depth appropriate for someone aspiring to study higher-level mathematics and/or to become a professional mathematician.
- To present an introduction to the field of Statistics, with emphasis on those aspects of the subject that are basic to higher mathematics.
- Students will learn the fundamentals of Statistical Methods.
- To introduce the student to what it means to do mathematics, as opposed to learning about mathematics or to learning to do computational exercises.
- To help the student learn how to write mathematical text according to the standards of the profession.

COURSE OUTLINE:

Unit 1: Probability axioms, Combinational formulae, Conditional probability, Bays theorem, Independent events, Concept of a random variables, The distribution function, Random variables of discrete and continuous types, Marginal distributions, Conditional distributions, Independent random variables. **(Recalling the definition only- problems not to be included)**

Chapter 1: Sections 1.3 to 1.7

Chapter 2: Sections 2.1 to 2.4, 2.6 to 2.8 **15 hrs**

Unit 2: Parameters of distributions- expectation, Chebyshev inequality, absolute moments, characteristic functions- properties, moments, characteristics function of the sum of independent random variables, determination of distribution function by the characteristic function- simple problems only.

Chapter 1: Sections 1.3 to 1.7

Chapter 2: Sections 2.1 to 2.4, 2.6 to 2.8 **15 hrs**

Unit 3: Some probability distributions- one point and two point distributions, Binomial, Poisson, Uniform, Normal, Gamma & Beta distributions

Chapter 5: Sections 5.1 to 5.9 **10 hrs**

Unit 4: The theory of estimation: Preliminary notations- Consistent estimates-Unbiased estimates- The sufficiency of an estimate- the efficiency of an estimate.

Chapter 13: Sections 13.1 to 13.5 **10 hrs**

Unit 5: Analysis of variance: one way classification – Multiple classification

Chapter 15: Sections 15.1, 15.2 **10 hrs**

RECOMMENDED TEXTBOOKS:

Probability theory and Mathematical Statistics, M. Fisz, John Wiley and Sons, New York, 1963.

REFERENCE BOOKS:

1. Real Analysis and Probability, R. B. Ash, Academic press, New York, 1972.
2. A Course in Probability, K. L. Chung, Academic press, New York, 1974
3. Mathematical Statistics, B. L. Van der Waerden, Galen and Unwin Ltd., London 1968.
4. An Introduction to probability theory and Mathematical Statistics by V. K. Rohatgi
5. A Graduate course in Probability by TUCKER, H. G. New York 1967

JOURNAL

Journal of Mathematics and Statistics and Science Publication

Journal of statistical planning and information - Elsevier

E-LEARNING RESOURCES:

www.stats.ox.ac.uk>student_resources>bammah>course_material

www.tsm-resources.com>mlink

maths.cusal.ac.in

<http://mathforum.org>,

<http://ocw.mit.edu/ocwweb/Mathematics>,

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Students will know the definitions of standard terms in Statistics
CO 2	Students will know a variety of examples and counterexamples in Statistics
CO 3	Students will know about the fundamental measures of Statistics and standard distributions.
CO 4	Students will be able to work with new ideas in Statistics.
CO 5	Students will be able to clearly communicate ideas and proofs.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	2	3
CO 2	2	3	2	2	3
CO 3	2	3	2	2	3
CO 4	2	3	2	2	2
CO 5	2	3	3	3	2
AVERAGE	2	3			

SEMESTER I
NUMBER THEORY AND CRYPTOGRAPHY
TOTAL HOURS: 75 **COURSE CODE: 176105**
CREDITS: 5 **L-T-P: 4-1-0**

COURSE OBJECTIVES :

1. To provide introduction to number theory and finite fields.
2. To test numbers for Primality.
3. To understand the fundamentals of Cryptography.
4. To give an idea of Cryptosystems in the context of Algebra and Number Theory.
5. To acquire knowledge on mathematical concepts underlying digital signatures, private key and public key encryption.

COURSE OUTLINE:

Unit 1:	Some Topics in elementary number theory: - Time estimates for doing Arithmetic – Divisibility and the Euclidean Algorithm Chapter 1: Sec 1, 2	15 hrs
Unit 2:	Congruences, Some Applications to factoring Chapter 1: Sec 3, 4	15 hrs
Unit 3:	Finite fields: Quadratic Residues and Reciprocity Chapter 2: Sec 1, 2	15 hrs
Unit 4:	Cryptography – Some simple Cryptosystems – Enciphering Matrices Chapter 3: Sec 1, 2	15 hrs
Unit 5:	Public key – The idea of public key Cryptography – RSA – Discrete Log Chapter 4: Sec 1, 2, 3	15 hrs

RECOMMENDED TEXT BOOK :

1. Neal koblitz, A course in Number Theory and Cryptography, Springer Verlag, New York, 1987.

REFERENCE BOOKS:

1. An introduction to Theory of Number, Niven and Zukermann (EDN - 3), Wiley Eastern ltd., New Delhi 1976.
2. Elementary Number Theory, David M. Burton, Wm.C. Brown publishers, Dubuque, IOWA 1989.
3. A classical introduction to Modern Number Theory, K.Ireland and M.Rosen, Springer Verlag 1972.

JOURNAL:

1. Journal of Number theory, Elsevier, www.elsevier.com
2. International journal of pure and applied mathematics, <http://www.ijpam.eu>

E-LEARNING RESOURCES:

1. <https://www.coursera.org/cryptography>
2. <https://www.classcentral.com>
3. <https://www.udemy.com/cryptography>
4. <https://www.open.edu>
5. <https://www.blogs.ams.org>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Derive time estimates using Euclidean Algorithm
CO 2	Apply theorems to factor congruence equations
CO 3	Gain knowledge of finite fields and quadratic residues
CO 4	Demonstrate the basics of cryptography
CO 5	Apply public key cryptosystems

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2.2	2.2

SEMESTER II ALGEBRA II

TOTAL HOURS: 75

CREDITS: 4

COURSE CODE: 176106

L-T-P: 4-1-0

COURSE OBJECTIVES:

1. To understand the concepts of Extension fields.
2. To learn about the roots of polynomials and splitting fields.
3. To explain Elements of Galois Theory.
4. To discuss finite fields.
5. To demonstrate Frobenius Theorem and Integral Quaternion.

COURSE OUTLINE:

Unit 1:	Extension fields – finite extension – algebraic extension– algebraic number. Chapter 5: Section 5.1	15 hours
Unit 2:	Roots of Polynomials, Splitting field – examples – more about roots simple extension. Chapter 5: Section 5.3 & 5.5	15 hours
Unit 3:	Elements of Galois Theory. Chapter 5: Section 5.6	15 hours
Unit 4:	Finite fields – Wedderburn's theorem on finite division rings. Chapter 7:Section 7.1 & 7.2 (theorem 7.2.1 only)	15 hours
Unit 5:	A theorem of Frobenius – Integral Quaternion and Four-Square Theorem Chapter 7:Section 7.3, 7.4	15 hours

RECOMMENDED TEXT BOOK :

1. Topics in Algebra (II Edition), I.N. Herstein, Wiley eastern Limited, New Delhi, 1975.
2. Algebra, L.S. Luther & I.B.S.P. Passi, Vol I – Groups (1996) ; Vol II Rings, Narosa Publishing House, New Delhi, 1999.

BOOKS FOR REFERENCE:

1. Algebra, M. Artin, Prentice Hall of India, 1991.
2. Basic Abstract Algebra, P.B. Bhattacharya, S.K. Jain & S.R. Nagpaul, (II Edition).
3. Cambridge University Press, 1997, Indian Edition.
4. Fundamental of Abstract Algebra, D.S. Malik, J.N. Mordeson & M.K. Sen, McGraw Hill (International Edition), New York, 1997

5. N.jacobson, Basic Algebra, Vol I & II, W.H.Freeman (1980); also published by Hindustan Publishing Company, New Delhi.

JOURNAL

1. International journal of Algebra and computation
<https://www.worldscientific.com/worldscinet/ijac>
2. International journal of pure and applied mathematics
www.springer.com/mathematics/journal/13226

E-LEARNING RESOURCES:

1. <https://www.Khanacademy.org>basis>
2. <https://www.mathplanet.com>homomorphism>
3. <https://www.mathhelp.com>lagranges>
4. <https://www.homeschoolmathonline.com>algebra>
5. <https://www.udemy.com>wedderburn>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Gain knowledge of extension fields
CO 2	Identify roots of polynomials
CO 3	Explain Galois Theory.
CO 4	Apply Wedderburn's theorem on finite division rings.
CO 5	Analyze applications of Frobenius theorem.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2.2	2.2

SEMESTER II
REAL ANALYSIS II

TOTAL HOURS: 75

COURSE CODE: 176107

CREDITS: 4

L-T-P: 4-1-0

COURSE OBJECTIVES:

1. This course provides the essential foundations of important aspect of mathematical analysis.
2. Measure theory and theory of the integral have numerous applications in other branches of pure and applied mathematics.
3. To give mathematical foundation of the Riemann integral which allows for better understanding of the fundamental relations between differentiation and integration.
4. To have a working knowledge on Multi-variable calculus.

COURSE OUTLINE:

Unit 1: Measure on the Real Line – Lebesgue Outer Measure – Measurable Sets – Regularity – Measurable functions. 15 Hrs

Chapter 2: Sections: 2.1 to 2.4 (de Barra)

Unit 2: Integration of functions of a Real Variable – Integration of Non – Negative Functions – The General Integral Riemann and Lebesgue Integrals. 15 Hrs

Chapter 3: Sections: 3.1, 3.2 & 3.4 (de Barra)

Unit 3: Fourier Series and Fourier Integrals – Introduction – Orthogonal System of functions – The theorem on best approximation – The Fourier Series of a function related to an orthonormal system – Properties of Fourier Coefficients – The Riesz – Fischer Theorem – The Convergence and representation problems for Trigonometric series – The Riemann Lebesgue Lemma. 15 Hrs

Chapter 11: Sections: 11.1 to 11.8 (Apostol)

Unit 4: Multivariable Differential Calculus – Introduction – The Directional Derivative and Continuity – The Total Derivative – The total derivative expressed in terms of Partial Derivatives – The matrix of a linear function, the Jacobian matrix, the chain rule, matrix form of the chain rule, the mean value theorem for differentiable functions, A sufficient condition for differentiability – A sufficient condition for equality of mixed partial derivatives. 15 Hrs

Chapter 12: Sections: 12.1 to 12.13 (Apostol)

Unit 5: Implicit functions and extremum problems; Functions with non – zero Jacobian determinants– The Inverse function theorem – The Implicit function theorem – Extrema of real valued function of several variables. 15 Hrs

Chapter 13: Sections: 13.1 to 13.6 (Apostol)

RECOMMENDED TEXT BOOK :

1. Measure Theory and Integration, G.de. Barra, Wiley Eastern Ltd., New Delhi, 1981
(for Unit I & II)
2. Mathematical Analysis, Tom M. Apostol :2nd edition, Addison – Wesley publishing company Inc. Newyork, 1974. (for Units III, IV & V)

BOOKS FOR REFERENCE:

1. Real Analysis, Roydon, H.L. Macmillan Publishing company, NewYork 1988.
2. A Course in Multivariate Calculus, Sudir Chorpode, Springer Verlag Publications.
3. Royden, H.L. & P. M. Fitzpatrick, Real Analysis, Pearson Education (2011).
4. Jain, P.K., and Gupta, V.P., Lebesgue Measure and Integration, New Age International Ltd. (2010).
5. Rana, I.K., An Introduction to Measure and Integration, Narosa Publication House (2010).

JOURNALS:

1. Journal of Mathematical Analysis and Applications -Elsevier
2. <https://www.journals.elsevier.com/journal-of-mathematical-analysis-and-applications>.
3. *International Journal of Applied Mathematical Analysis and Applications*

E-LEARNING RESOURCES:

6. <https://ocw.mit.edu/courses/mathematics>
7. online.stanford.edu/courses
8. <https://www.coursera.org/lecture/mathematical-thinking/lecture-10a-real-analysis-1-CfSOd>.

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Analyze measurable sets and Lebesgue measure.
CO 2	To understand how measures may be used to construct integrals.
CO 3	To know the basic convergence theorems for the Lebesgue integral.
CO 4	Communicate Calculus and other mathematical ideas
CO 5	Apply the concept of Mean-value theorem for differentiable functions.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	2	3
CO 2	3	3	3	2	3
CO 3	3	3	3	2	3
CO 4	2	2	2	2	2
CO 5	2	3	3	3	2
AVERAGE	2	3	3	2	3

SEMESTER II
ORDINARY DIFFERENTIAL EQUATIONS

TOTAL HOURS: 75

COURSE CODE: 176108

CREDITS: 4

L-T-P: 4-1-0

COURSE OBJECTIVES:

- To provide standard methods for solving differential equations.
- To demonstrate how the order of the differential equations can be reduced to lower order and solve the same equations.
- To study Legendre equations, Bessels equations.

COURSE OUTLINE:

UNIT 1: Linear equations with constant coefficients: Second order homogeneous equations- Initial value problems-Linear dependence and independence Wronskian and a formula for Wronskian. Chapter 2: Sections 1 to 6 15 Hours

UNIT 2 : Linear equations with constant coefficients: Homogeneous and non homogeneous equation of order n –Initial value problems- Annihilator method to solve non-homogeneous equation. Chapter 2 : Sections 7 to 11.(omit Sec.10) 15 Hours

UNIT 3: Linear equation with variable coefficients: Initial value problems -Existence and uniqueness theorems – Solutions to solve a non-homogeneous equation – Wronskian and linear dependence – reduction of the order of a homogeneous equation and non homogeneous equation with analytic coefficients-The Legendre equation. Chapter : 3 Sections 1 to 8 15 Hours

UNIT 4: Linear equation with regular singular points: Euler equation – Second order equations with regular singular points –Exceptional cases- Bessel Function.

Chapter 4 : Sections 1 to 4 and 6 to 8 15 Hours

UNIT 5: Existence and uniqueness of solutions to first order equations: Equation with variable separated – Exact equation - method of successive approximations - the Lipschitz condition- convergence of the successive approximations and the existence theorem.

Chapter 5 : Sections 1 to 6 15 Hours

RECOMMENDED TEXT BOOK :

E.A.Codington, An Introduction to Ordinary Differential Equation, Prentice Hall of India, New Delhi, 1987.

BOOKS FOR REFERENCE:

1.S.G.Deo and V. Raghavendra: Ordinary Differential Equations, Tata McGraw Hill Pub. Co., New Delhi, 1997.

2. R.P Agarwal and Ramesh C.Gupta, Essentials of Ordinary Differential Equation. McGraw, Hill, New York, 1991.

3. D.Somasundram, Ordinary Differential Equations, Narosa Publ.House, Chennai – 2002.

4. D.Raj, D.P.Choudhury and H.I.Freedman, A Course in Ordinary Differential Equations, Narosa Publ. House, Chennai, 2004.

5. D. A. Sanchez, Ordinary Differential Equations and Stability Theory: An Introduction, Dover Publ. Inc., New York, 1968.

6. M. Rama Mohana Rao: Ordinary differential equations -Theory and applications. Affiliated East West Press, New Delhi, 1980.

7. G.F. Simmons, Differential equations: Theory, Technique and practice, McGraw Hill.

JOURNALS:

K. Ravi, B. Ravikrishnan, Solution of Wronskian differential equation, International Journal of Pure and Applied Mathematics, 27, No. 2 (2006), 263-273.

PROPERTIES OF WRONSKIAN AND PARTIAL WRONSKIAN G. Ganapathy¹, S. Murthy², M. Arunkumar³, International Journal of Pure and Applied Mathematics, Volume 63 No. 1 2010, 21-30.

E-LEARNING RESOURCES:

<http://mathforum.org>,

<http://ocw.mit.edu/ocwweb/Mathematics>,

<http://www.opensource.org>,

www.mathpages.com

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Find Linear dependence and independence of solutions of homogeneous Linear equations.
CO 2	Find solutions of the non-homogeneous equations by Annihilator method. Legendre equations.
CO 3	Find singular and regular singular points of a differential equation.
CO 4	Find solutions of Bessel's Equation.
CO 5	Find given equation is an exact equation or not

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	2	3
CO 2	3	3	3	2	3
CO 3	3	3	3	2	3
CO 4	2	2	2	2	2
CO 5	2	3	3	3	2
AVERAGE	2	3	3	2	3

SEMESTER II
OBJECT ORIENTED PROGRAMMING WITH C++ (THEORY)

TOTAL HOURS: 75

COURSE CODE: 176109

CREDITS: 4

L-T-P: 4-1-0

COURSE OBJECTIVES:

1. To provide an introduction to OOP using C++ programming language
2. To acquire skills of the basic concepts and techniques which form the object oriented programming paradigm.
3. To gain knowledge of abstract data types, encapsulation, inheritance and polymorphism.
4. To understand the concept of overload functions and operators.
5. To learn how inheritance and virtual function implement dynamic binding with polymorphism.

COURSE OUTLINE:

Unit 1:	Principles of Object Oriented Programming (OOP): Software Evolution – OOP paradigm – Basic concepts of OOP – Object Oriented Languages.	15 hours
Unit 2:	Introduction to C++, Tokens, Keywords, identifiers and constants, Reference Variables, Operators, Manipulators, Expressions and Control Structures in C++.	15 hours
Unit 3:	Functions of C++ - Main Function – Function prototyping – Parameters Passing in Functions – Values Return by Functions – Inline Functions – Friend and Virtual Functions – Classes and Objects.	15 hours
Unit 4:	Constructors and Destructors; and operator Overloading and type conversions – Types of constructors – Function overloading	15 hours
Unit 5:	Inheritance: Single Inheritance – Multilevel inheritance – Multiple inheritance – Hierarchical Inheritance – Hybrid inheritance. Polymorphism – Classes for file stream operations – Error handling during file operations – Command – line arguments.	15 hours

RECOMMENDED TEXT BOOK :

1. Object Oriented programming with C++, E. Balagurusamy, Second edition, Tata McGraw – Hill Publishing Company Ltd., New Delhi.

BOOKS FOR REFERENCE:

1. Object Oriented programming with C++, Ananthi Sheshasaayee & Sheshasaayee :Margham Publishers, 2001.

JOURNALS:

1. Programming Journals (Magazines)-C++ forum,
<http://www.accu.org/index.php>
1. C/C++ user journal
1. Index of/Science/rnp/bibile/ddj

E-LEARNING RESOURCES:

1. <https://www.udemy.com/cpp>
2. <https://www.geeksforgeeks.org>
3. <https://www.edx.org/inheritance>
4. <https://www.learncpp.com>
5. <https://alison.com>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Knowledge of object oriented programming
CO 2	Understand basic concepts of C++ programming
CO 3	Demonstrate functions and classes
CO 4	Compare Constructors and Destructors
CO 5	Apply Single Inheritance, Multilevel inheritance, Hierarchical Inheritance and file stream operations

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2.2	2.2

SEMESTER II
OBJECT ORIENTED PROGRAMMING WITH C++ (PRACTICAL)

TOTAL HOURS: 75

COURSE CODE: 176110

CREDITS: 3

L-T-P: 4-1-0

COURSE OBJECTIVES:

1. To understand how C++ improves C with object oriented features
2. To introduce the syntax and semantics of C++ programming language.
3. To learn how to write inline functions for efficiency and performance
4. To design C++ classes for code reuse.
5. To implement copy constructor and class member functions.

PRACTICAL: Develop Programs for the following:

1. To accept and display the passenger information.
2. To demonstrate the use of over loaded constructors.
3. To construct 2 dimensional arrays.
4. To implement destructors.
5. Operator Overloading (for unary operators).
6. Overloading operators using friends.
7. Single Inheritance : Public
8. Single Inheritance : Private
9. Multiple Inheritance : To obtain personal information
10. File Manipulation : to write data into a file and count the number of lines and characters.

RECOMMENDED TEXTBOOKS:

1. Object Oriented programming with C++, E. Balagurusamy,
Sixth edition, Tata McGraw – Hill Publishing Company Ltd., New Delhi.

BOOKS FOR REFERENCE:

1. Object Oriented programming with
C++, Ananthi Sheshasaayee & Sheshasaayee : Margham Publishers, 2001.

JOURNALS:

1. Programming Journals (Magazines)-C++ forum,
<http://www.accu.org/index.php>
2. C/C++ user journal

3. Index of/Science/rnp/bibile/ddj

E-LEARNING RESOURCES:

- 1 <https://www.tutorialspoint.com>cpp>
- 2 <https://www.studytonight.com>
- 3 <https://stackoverflow.com>
- 4 <https://beginnersbook.com>
- 5 <https://www.learnpracticals.com>cpp>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Gains knowledge of object oriented features of C++
CO 2	Create 2 dimensional arrays.
CO 3	Acquire knowledge of friend functions
CO 4	Implement Single and multiple Inheritance
CO 5	Understand various file manipulations.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2.2	2.2

SEMESTER II
QUANTITATIVE APTITUDE

TOTAL HOURS: 45
CREDITS: 3

COURSE CODE: 176111
L-T-P: 4-1-0

COURSE OBJECTIVES:

- 1. To enhance the problem solving skills**
- 2. To improve the basic mathematical skills**
- 3. Helps students to prepare any type of competitive examinations**

COURSE OUTLINE:

Unit 1: Profit and loss	Hours:9Hrs
Unit 2: Simple and Compound Interest	Hours:9Hrs
Unit 3: True discount	Hours:9Hrs
Unit 4: Banker's Discount	Hours: 9 Hrs
Unit 5: Stock's and Shares	Hours: 9 Hrs

RECOMMENDED TEXTBOOKS:

Quantitative Aptitude by Dr.R.S.Agarwal, S.Chand & Company Ltd. Seventh Revised Edition.

BOOKS FOR REFERENCE:

- 1. Quantitative Aptitude by R.V.Praveen, PHI Learning pvt. Ltd.**
- 2. A Modern approach to verbal and Non verbal reasoning, R.S.Aggarwal,**

JOURNALS:

1. Journal Of quantitative linguistics
2. Journal of financial and quantitative analysis

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	To understand the basic concepts of quantitative ability
CO 2	Will be able to understand the concepts of logical reasoning skills
CO 3	Acquire satisfactory competency in use of verbal reasoning
CO 4	Solve campus placements aptitude papers
CO 5	To compete in various competitive examinations like CAT, CMAT, GATE, GRE, UPSC etc.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2.2	2.2

SEMESTER III TOPOLOGY

TOTAL HOURS: 75
CREDITS: 4

COURSE CODE: 176112
L-T-P:4-1-0

COURSE OBJECTIVES:

- To explore the foundations of mathematics (logic and set theory) at a level and depth appropriate for someone aspiring to study higher-level mathematics and/or to become a professional mathematician.
- To present an introduction to the field of topology, with emphasis on those aspects of the subject that are basic to higher mathematics.
- Students will learn the fundamentals of algebraic topology.
- To introduce the student to what it means to do mathematics, as opposed to learning about mathematics or to learning to do computational exercises.
- To help the student learn how to write mathematical text according to the standards of the profession.

COURSE OUTLINE:

- Unit 1:** Topology Spaces: Topological Spaces – Basis for a topology – The order topology – The product topology on $X \times Y$ – The subspace topology – Closed sets and limit points. (Results based on Box Topology to be deleted) 15 Hrs
Chapter 2: Sections 12 to 17.
- Unit 2:** Continuous functions – the Product Topology, Metric Topology, Metric Topology Continued 15 Hrs
Chapter 2: Sections 18 to 21
- Unit 3:** Connected Spaces – Connected Subspaces of the real line, Components and local connectedness 15 Hrs
Chapter 3: Sections 23, 24, 25
- Unit 4:** Compact Spaces - Compact Subspaces of the real line – Limit Point Compactness 15 Hrs
Chapter 3: Sections 26 to 28
- Unit 5:** Countability and Separation axiom: The Countability axioms – The Separation Axioms - Normal Spaces – The Urysohn Lemma – The Urysohn Metrization Theorem – Tietze Extension Theorem. 15 Hrs
Chapter 4: Sections 30 to 35

*** All results and examples on box topology to be excluded.**

RECOMMENDED TEXTBOOKS:

Topology, James R. Munkres (2nd Edition) Pearson Education Pvt. Ltd., Delhi 2002.
(Third Indian Reprint)

Books for Reference:

1. Introduction to Topology and Modern Analysis, George F. Simmons, McGraw Hill Book Co., 1963.
2. J. Dugundji, Topology, Prentice Hall of India, New Delhi, 1975.
3. L. Kelly, General Topology, Van Nostrand, Reinhold Co., New York.
4. K. D. Joshi, Introduction to General Topology, Wiley Eastern Ltd., 1983.
5. C. Wayne Patty, Foundations of Topology, (Student Edition), Jones & Bartlett India Pvt. Ltd., New Delhi.
6. Colin Adams, Robert Franzosa, Introduction to Topology Pure and Applied, Pearson Education, Indian Edition, 2009.

JOURNALS:

Topology and its Applications, Elsevier

3. Journal of topology and analysis, World Scientific.com

E-LEARNING RESOURCES:

1. www.mathforum.org>home>mathtopics
2. www.topology.org>sci>math
3. www.maths.ox.ac.uk>groups>topology
4. www.monash.edu>pubs>units>MTH3130

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Students will know the definitions of standard terms in topology
CO 2	Students will know a variety of examples and counterexamples in topology.
CO 3	Students will know about the fundamental group and covering spaces.
CO 4	Students will be able to work with new ideas in mathematics.
CO 5	Students will be able to clearly communicate ideas and proofs.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	2	3
CO 2	3	3	3	2	3
CO 3	3	3	3	2	3
CO 4	2	2	2	2	2
CO 5	2	3	3	3	2
AVERAGE	2	3	3	2	3

SEMESTER III
DIFFERENTIAL GEOMETRY

TOTAL HOURS: 75

COURSE CODE: 176113

CREDITS: 4

L-T-P: 4-1-0

COURSE OBJECTIVES:

1. To analyse the concept of the theory of space curves.
2. To learn about involutes and evolutes of spaces curves.
3. To study the local intrinsic properties of a surface, Normal property of geodesics, Gaussian curvature .
4. To study the developables associates with curves on surfaces.
5. To study Hilbert lemma.

COURSE OUTLINE:

UNIT 1: Space curves: Definition of a space curve – Arc length – tangent – normal and binormal – curvature and torsion – contact between curves and surfaces.

Chapter I : Sections 1 to 6.

Hours: 15 Hrs

UNIT2: Tangent surface- involutes and evolutes- Intrinsic equations – Fundamental Existence Theorem for space curves- Helices- Intrinsic properties of a surface: Definition of a surface curves on a surface – Surface of revolution – Helicoids.

Chapter I : Sections 7 to 9. Chapter II: Sections 1 to 4.

Hours: 15 Hrs

UNIT3: Metric- Direction coefficients- families of curves-Isometric correspondence.

Chapter II: Sections 5 to 8.

Hours: 15 Hrs

UNIT 4: Geodesics: Geodesics – Canonical geodesic equations – Normal property of geodesics- Geodesics curvature- Gauss- Bonnet Theorem – Gaussian curvature surface of constant curvature.

Chapter II: Sections 10 to 18

Hours: 15 Hrs

UNIT 5: Non Intrinsic properties of a surface: The second fundamental form- Principle curvature – Lines of curvature – Developable - Developable associated with space curves and with curves on surface –Minimal surface-Ruled surface(Results based on Intrinsic Properties and Isometric Correspondence-not included).

Chapter III: Sections 1 to 8

Hours: 15 Hrs

RECOMMENDED TEXT BOOK :

1. . “An Introduction To Differential Geometry (Dover Books On Mathematics)” by T J Willmore, Oxford University Press (17 th Impression) New Delhi 2002. (Indian Print).

BOOKS FOR REFERENCE:

1. T. Willmore, An Introduction to Differential Geometry, Clarendon Press, Oxford, 1959.
2. D.T Struik, Lectures on Classical Differential Geometry, Addison – Wesley, Mass. 1950.
3. J.A. Thorpe, Elementary Topics in Differential Geometry, Springer – Verlag, New York, 1979.
4. “Differential Geometry and Tensors” by K K Dube
5. “Lectures on Classical Differential Geometry: Second Edition (Dover Books on Mathematics)” by Dirk J Struik.
6. A Course in Differential Geometry and Lie Groups (Texts and Readings in Mathematics)” by S Kumaresan.
7. “Differential Geometry (Dover Books on Mathematics)” by Erwin Kreyszig.

JOURNALS:

APPROXIMATELY ISOMETRIC SHAPE CORRESPONDENCE BY MATCHING POINTWISE SPECTRAL FEATURES AND GLOBAL GEODESIC STRUCTURES. Advances in Adaptive Data Analysis Vol. 3, Nos. 1 & 2 (2011) 203–228 c World Scientific Publishing Company.

E-LEARNING RESOURCES:

<http://mathforum.org>,

<http://ocw.mit.edu/ocwweb/Mathematics>,

<http://www.opensource.org>,

www.mathpages.com

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Find the curvature and the torsion of space curves.
CO 2	Find involute and evolute of space curves.
CO 3	Find orthogonal trajectory for a given family of curves
CO 4	Find isometric correspondence between any two surfaces.
CO 5	Find Gaussian curvature

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	2	3
CO 2	3	3	3	2	3
CO 3	3	3	3	2	3

CO 4	2	2	2	2	2
CO 5	2	3	3	3	2
AVERAGE	2	3	3	2	3

SEMESTER III MECHANICS

TOTAL HOURS: 75

CREDITS: 4

COURSE CODE: 176114

L-T-P: 4-1-0

COURSE OBJECTIVE:

1. To introduce basic concepts of mechanical system.
2. To derive Lagrange's Equations
3. To acquire knowledge of Hamilton Principle.
4. To gain knowledge of Hamilton Jacobi theory.
5. To learn the concepts of Separability.

COURSE OUTLINE:

Unit 1: Mechanical Systems: The Mechanical System – Generalised Co-ordinates- Constraints Virtual work – Energy and Momentum. Chapter 1: Sections 1.1 to 1.5	15 hours
Unit 2: Lagrange's Equations : Derivation of Lagrange's Equations- Examples- Integrals of motion. Chapter 2: Sections 2.1 to 2.3	15 hours
Unit 3: Hamilton's equations : Hamilton Principle- Hamilton's equations- other variational principle. Chapter 4: Sections 4.1 to 4.3	15 hours
Unit 4: Hamilton- Jacobi theory: Hamilton Principle function – Hamilton – Jacobi Equation. Chapter 5: Sections 5.1 to 5.2	15 hours
Unit 5: Separability. Chapter 5:Section 5.3	15 hours

RECOMMENDED TEXT BOOK:

1. D.T. Greenwood, Classical Dynamics, Prentice Hall of India, New Delhi, 1985
2. Classical Mechanics, (2nd edition) ,H-Goldstein, Narosa publishing House-, New Delhi.

BOOKS FOR REFERENCE:

1. Classical Mechanics,NC. Rane and P.S.G.Joag, Tata Mc Graw Hill, 1991
2. Principles of Mechanics (3rd Edition) ,J.L.Synge& B.A. Griffth , McgrawHill Book Co., Newyork, 1970

JOURNAL:

4. International journal of mechanics and material in design
5. European Journal of Mechanics

E-LEARNING RESOURCES:

1. <https://en.m.wikipedia.org>mechanics>
2. <https://www.britannica.com>science>
3. <https://www.coursera.org>learn>
4. <https://www.merriams-webster.com>
5. <https://www.edx.org>mechanics>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Discuss Mechanical System, Constraints on Virtual work – Energy and Momentum.
CO 2	Demonstrate Lagrange's Equations and its applications.
CO 3	Explain Hamilton Principle and other variational Principles.
CO 4	Utilize knowledge of Hamilton Jacobi theory.
CO 5	Describe Separability principle

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2.2	2.2

SEMESTER III DISCRETE MATHEMATICS

TOTAL HOURS: 75
CREDITS: 4

COURSE CODE: 176115
L-T-P: 4-1-0

COURSE OBJECTIVES:

1. To demonstrate an understanding of relations and its properties.
2. To provide fundamentals and concepts of discrete mathematical structures with applications to Boolean Algebra, switching circuits and finite state machine.
3. To acquire knowledge of lattices, Posets and to construct its mathematical properties.
4. To appreciate basic principles of Boolean Algebra in design examples.
5. To learn the application of group codes in communication models.

COURSE OUTLINE:

Unit 1:	Relations & Ordering: Relations, Properties of Binary Relations in a Set, Relation Matrix and the Graph of a Relation, Partition & Covering of a Set, Equivalence Relations, Compatibility Relations, Composition of Binary Relations, Partial Ordering, Partially Ordered Set: Representative and Associated Terminology. Chapter 2: Sections 2.3: 2.3.1 to 2.3.9	15 hours
Unit 2:	Lattices and Boolean algebra: Definition and Examples, properties of Lattices, Lattices as Algebraic Systems, Sublattices, Direct Product and Homomorphism, Special Lattices, Boolean algebra- Definition, Examples, subalgebra, Direct Product, Homomorphism. Chapter 4: Sections 4.1: 4.1.1 to 4.1.5 and 4.2: 4.2.1 to 4.2.2.	15 hours
Unit 3:	Boolean functions – Boolean forms and free Boolean algebras, values of Boolean expressions and Boolean functions. Chapter 4: Sections 4.3 : 4.3.1 to 4.3.2	15 hours
Unit 4:	Representations of Boolean functions and minimization of Boolean Functions, Design examples using Boolean algebras, finite state machines. Chapter 4: Sections 4.4 : 4.4.1 to 4.4.2, 4.5 and 4.6: 4.6.1 to 4.6.2.	15 hours
Unit 5:	Group codes: The Communication Model and the basic notions of Error Correction, Generation of codes by using parity checks, Error Recovery in Group Codes. Chapter 3: Sections 3.7: 3.7.1 to 3.7.3.	15 hours

RECOMMENDED TEXT BOOK:

1. “Discrete Mathematical structures with applications to Computer Science” by Tremblay J P and Manohar R, Tata Mcgraw Hill edition 1997.
2. Discrete Mathematics, Dr.M.K. Venkataraman, Dr.N.Sridharan, N.Chadrasekaran, The National Publishing Company.

BOOK FOR REFERENCE:

1. Rudolf Lidl and Gunter Pilz, Applied Abstract Algebra, Springer-Verlag, New York, 1984.
2. A.Gill, Applied Algebra for Computer Science, Prentice Hall Inc., New Jersey.
3. J.L.Gersting, Mathematical Structures for Computer Science (3rdEdn.), Computer Science Press, New York.
4. S.Wiitala, Discrete Mathematics- A Unified Approach, McGraw Hill Book Co.

JOURNAL:

1. Indian journal of Discrete mathematics, ijdm.adma.co.in
2. Journal of discrete mathematics, www.tandfonline.com
3. SIAM Journal on Discrete Mathematics, <https://www.siam.org>

E-LEARNING RESOURCES:

1. <https://www.coursera.org>
2. <https://www.udemy.com>discrete>
3. <https://www.classcentral.com>boolean>
4. <https://www.openlearning.com>lattices>
5. <https://www.onlinemathlearning.com>karnaugh>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Evaluate equivalence relations and compatible relations.
CO 2	Techniques for constructing mathematical proofs on lattices
CO 3	Compute Boolean functions
CO 4	Representing and minimizing Boolean functions
CO 5	Discuss group codes and error corrections

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2.2	2.2

SEMESTER III
MATHEMATICAL PROGRAMMING

TOTAL HOURS: 75

COURSE CODE: 176116

CREDITS: 3

L-T-P: 4-1-0

COURSE OBJECTIVES:

1. To impart knowledge in concepts and tools of Operations Research.
2. To understand mathematical models used in Operations Research.
3. To apply these techniques constructively to make effective business decisions.
4. Develop an understanding of optimality conditions for both constrained and unconstrained nonlinear optimization problems.
5. Review and extend knowledge and understanding of the underlying mathematical foundations of the field of optimization.
6. Understand the computational issues involved in solving non-linear program.

COURSE OUTLINE:

Unit 1: Integer Programming	15 Hrs
Gomory's Cutting Plane Algorithm – Branch and Bound (Two Variables only) Sections: 9.2.1-9.2.5,	
Unit 2: Dynamic Programming	15 Hrs
Deterministic Dynamic Programming: Recursive nature of computations in DP – Selected DP applications–Problem of Dimensionality. Sections :10.1 – 10.5	
Unit 3: Goal Programming	15 Hrs
Introduction –Goal Programming model formulation – Graphical method for Goal programming –Difference between LP and GP approach- Application of Goal Programming. Sections: 9.1.1 – 9.1.5	
Unit 4: Non-Linear Programming	15 Hrs
Unconstrained Non- linear algorithms Direct Search method – Gradient method – Constrained algorithms-Quadratic Programming, Geometric Programming – Separable Programming. Sections: 21.1, 21.2.1 - 21.2.3	
Unit 5: Classical Optimization Techniques	15 Hrs
Introduction to Unconstrained problems- Necessary and sufficient conditions – Newton- Raphson method Constrained problems Equality Constraints and Inequality Constraints (Kuhn – Tucker Necessary and Sufficient Conditions). Sections: 20.1- 20.3	

RECOMMENDED TEXTBOOKS:

1. Operations Research, Hamdy A. Taha, (Sixth Edition) Prentice Hall of India Private Limited, New Delhi, 1997. (Unit II, IV and V)
2. Operations Research by A.P.Verma, Second edition 2001, S.K.Kataria and Sons (Unit I and III)

REFERENCE BOOKS:

1. Sharma J.K., Operations Research: Theory and Applications, Macmillan India, New Delhi.
2. F.S. Hillier & J.Lieberman Introduction to Operation Research (7th Edition) Tata-McGraw Hill Company, New Delhi, 2001.
3. Beightler. C, D.Phillips, B. Wilde ,Foundations of Optimization (2nd Edition) Prentice Hall Pvt Ltd., New York, 1979
4. S.S. Rao - Optimization Theory and Applications, Wiley Eastern Ltd. New Delhi. 1990.
5. Churchman, C.W.: Introduction to Operation Research. John Willey & Sons Newyork.

JOURNALS:

Mathematical programming – Springer Science + Business Media

Mathematical methods of Operations Research – Springer.

E-LEARNING RESOURCES:

1. www.mathforum.org>home>mathtopics
2. www.du.ac.in>page=m-sc-operationalResearch
3. Freecomputerbooks.com>specialoperationresearchbook

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Can analyze solutions to a linear optimization problem
CO 2	Continue to improve their ability to rigorously prove mathematical statements
CO 3	Effectively solve problems and make decisions.
CO 4	Learn how and when to apply optimality conditions for practical problem solving.
CO 5	Learn and apply algorithmic and computational techniques for solving mathematical programs, particularly non-linear.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2.2	2.2

SEMESTER III

DATA ANALYSIS

TOTAL HOURS: 45

CREDITS: 3

COURSE CODE: 176117

L-T-P: 2-1-0

COURSE OBJECTIVES:

1. To interpret and evaluate data using analysis and statistics tools
2. Helps to arrive conclusion and hypothesis for a given situation
3. to establish special data collection and design data collection process

COURSE OUTLINE:

- Unit 1:** Excel-Introduction – Charts –Macros – Formula and name basics – Pivot 9 Hours
Table– Pivot Chart– Add-ins – Hands on training
- Unit 2:** Correlation – Introduction – Karl Pearson Correlation Coefficient 9 Hours
formula – limits – Calculation of correlation coefficient for a bivariate frequency distribution – Probable error of correlation coefficient – Application using excel.
- Unit 3:** Regression – Introduction – Definition – Properties – Curvilinear 9 Hours
Regression – Application using excel.
- Unit 4:** Time series – Introduction – Definition – Components of time series – 9 Hours
Measurment of Trend – Free hand /graphic method – Method of semi averages – Application using Excel.
- Unit 5:** Index Numbers – Definition – Types of index numbers ,Laspeyre`s, 9 Hours
Paasche`s and Fisher`s ideal index numbers .(Only formulae & Simple problems)

RECOMMENDED TEXT BOOK:

1. Fundamentals of Mathematical Statistics by S.C.Gupta and V.K .Kapoor Sultan Chand & Sons, New Delhi ,2009.
Chapter 10 – Pp10.1 to 10.6 ,10.32 – 10.38 (Unit 2)
Pp10.49 to 10.52 ,10.58 – 10.61 (Unit 3)
2. Business Statistics by P.R.Vittal , Margham Publications Pvt. Ltd Chennai-(Unit 4 & 5)
3. [www.excel](http://www.excel-easy.com/data-analysis.html) –easy .com /data – analysis.html (Unit 1- 5)

BOOK FOR REFERENCE:

1. Statistical Methods by S.P.Gupta, Sultan Chand & Sons , New Delhi , Reprints 2009.

JOURNALS:

1. Computational statistics and data analysis

<https://www.journals.elsevier.com>

2. Journal of computational and graphical statistics

<https://amsstat.tandfonline.com>>loi>ucgs20

E-LEARNING RESOURCES:

1. Ire.org/media/uploads/car2013_tipsheets/**excel**_stats_nicar2013.pdf.

2.Vfu.bg/en/e-Learning /MS- Office –**excel**.pdf

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	to analyze data and to produce indicators which are used to guide decision making
CO 2	Will be able to inspect transform and remodel data to view certain conclusions
CO 3	Will be to predict the behavior of an outcome based on a list data
CO 4	Will be able to predict future values based on previously obtained values
CO 5	Can construct and measures changes in the given price level over a period of time

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	2	3
CO 2	3	3	3	2	3
CO 3	3	3	3	2	3
CO 4	2	2	2	2	2
CO 5	2	3	3	3	2
AVERAGE	2	3	3	2	3

SEMESTER IV
COMPLEX ANALYSIS

TOTAL HOURS: 90
CREDITS: 4

COURSE CODE: 176118
L-T-P: 4-2-0

COURSE OBJECTIVE:

1. To introduce the basic concepts of complex analysis
2. To compute higher order derivatives using Cauchy's Integral formula
3. To understand harmonic functions and its properties.
4. To evaluate Definite Integrals.
5. To gain knowledge of reflection principle.

COURSE OUTLINE:

Unit 1:	Cauchy's Integral Formula: The index of a point with respect to a closed curve – The integral formula – Higher derivatives. Local properties of analytical Functions: Removable Singularities – Taylor's Theorem – Zeroes and Poles. Chapter 4: Sections 2.1 to 2.3, 3.1 to 3.2	18 Hours
Unit 2:	The local mapping – The maximum principle - The General Form of Cauchy's Theorem - Chains and Cycles – simple continuity – Homology – The General statement of Cauchy's theorem, Proof of Cauchy's theorem. Chapter 3: Sections 3.3 & 3.4 Chapter 4: Sections 4.1 to 4.5	18 Hours
Unit 3:	Locally Exact differential – Multiple connected regions. Calculus of Residues – Residue theorem – Argument principle Chapter 4: Sections 4.6&4.7, 5.1 to 5.2	18 Hours
Unit 4:	Evaluation of Definite Integrals and Harmonic Functions: Definition of Harmonic function and basic properties – mean value property – Poisson's formula. Chapter 4: Section 5.3, 6.1 to 6.3	18 Hours
Unit 5:	Harmonic Functions and power series expansions: Schwarz theorem – The reflection principle Weierstrass's theorem – Taylor's series – Laurent series. Chapter 4: Sections 6.4 and 6.5 Chapter 5: Sections 1.1 to 1.3	18 Hours

RECOMMENDED TEXT BOOKS:

1. Complex Analysis, Lars V. Ahlfors, (3rd edition) McGraw Hill Co., New York, 1979.
2. J.B. Corway, Functions of one complex variables, Springer - Verlag, International student Edition, Narosa Publishing Co.

BOOKS FOR REFERENCE:

1. Introduction to complex analysis, H.A. Prestly, Clarendon Press, Oxford, 1990.
2. E. Hille, Analytic function Thorey (2 vols.), Gonm& Co, 1959.
3. M.Heins, Complex function Theory, Academic Press, New York,1968.

JOURNAL:

1. Journal of Complex analysis
2. International journal of complex analysis system
www.ij_complexsys.org

E-LEARNING RESOURCES:

1. <https://www.coursera.org>complex>
2. <https://www.mooc-list.com>conjugation>
3. <https://www.classcentre.com>complex>
4. <https://www.edx.org>
5. <https://www.open.ac.uk>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Analyze Cauchy's Integral Formula.
CO 2	Discuss local mapping theorem and related topics.
CO 3	Study Residue theorem and the argument principle
CO 4	Evaluate Definite Integrals and Harmonic Functions.
CO 5	Differentiate the Taylor's series and Laurent series.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	2	3
CO 2	3	3	3	2	3
CO 3	3	3	3	2	3
CO 4	2	2	2	2	2
CO 5	2	3	3	3	2
AVERAGE	2	3	3	2	3

SEMESTER IV
FUNCTIONAL ANALYSIS

TOTAL HOURS: 90

CREDITS: 4

COURSE CODE: 176119

L-T-P: 4-2-0

COURSE OBJECTIVES:

- To study the main properties of bounded operators between Banach and Hilbert spaces.
- To know the basic results associated to different types of convergences in normed linear spaces and the spectral theorem and some of its applications.
- To study the infinite-dimensional vector spaces equipped with extra structure.
- To give students a working knowledge of the basic properties of Banach spaces, Hilbert spaces and bounded linear operators.
- To show students the idea of duals and adjoints.
- To demonstrate significant applications of the theory of functional analysis.

COURSE OUTLINE:

Unit 1:

Definition – Some examples – continuous Linear Transformations – The Hahn – Banach Theorem – The natural embedding of N in N^{**} .

Chapter 9: Sections 46 to 49.

Hours: 18Hrs

Unit 2:

Banach Spaces and Hilbert Spaces: Open mapping Theorem - Conjugate of an operator - Definition and some simple properties – Orthogonal complements – orthonormal sets.

Chapter 9: Sections 50 and 51

Chapter 10: Sections 52, 53, 54

Hours: 18Hrs

Unit 3:

Hilbert Space – Conjugate space – Adjoint of an operator – Self adjoint operators – Normal and unitary operators – Projections.

Chapter 10: Sections 55, 56, 57, 58 and 59

Hours: 18Hrs

Unit 4:

Preliminaries on Banach Algebras: Definition and some examples – Regular and singular elements – Topological divisors of Zero – Spectrum – the formula for the spectral radius – the radical and semi – simplicity.

Chapter 12: Sections 64 to 69

Hours: 18Hrs

Unit 5:

Structure of Commutative Banach Algebras – Gelfand Mapping – Applications of the formula $r(x) = \lim \|X^n\|^{1/n}$ – Involutions in Banach Algebras – Gelfand – Neumark Theorem.

Chapter 13: Sections 70 to 73.

Hours: 18Hrs

RECOMMENDED TEXT BOOKS:

Introduction to Topology and Modern Analysis, G.F. Simmons, McGraw Hill International Book Company, New York 1963.

BOOKS FOR REFERENCE:

1. Introductory functional Analysis with Applications, E. Kreyszig, John Wiley & Sons, New York 1978.
2. W. Rudin. Real and Complex Analysis. MacGraw-Hill Company.
3. E. Kreyszig, Introductory Functional Analysis with Applications, Wiley, 1978.
4. K. Saxe. Beginning Functional Analysis. Springer

JOURNALS:

1. Journal of Functional Analysis (<http://www.elsevier.com/mathematics>)
2. The International Journal of Functional Analysis, Operator Theory and Applications

E-LEARNING RESOURCES:

1. <http://www.ehu.es/luis.escauriaza/>
2. <http://www.matematica.ciencs.ucv.ve/labfg/anfun/afb-t.pdf>
3. UCCS 535 by Prof. Greg Morrow Applied Functional Analysis - UCCS MathOnline Course 535

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	The student has knowledge of central concepts from functional analysis, including the Hahn-Banach theorem, the open mapping and closed graph theorems.
CO 2	The student is able to apply her knowledge of functional analysis to solve mathematical problems.
CO 3	Understand and apply ideas from the theory of Hilbert spaces to other areas, including Fourier series.
CO 4	Understand the fundamentals of spectral theory, and appreciate some of its power.
CO 5	Develops necessary general preliminaries for the study of Gelfand theory of Banach algebra.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	2	3
CO 2	3	3	3	2	3
CO 3	3	3	3	2	3
CO 4	2	2	2	2	2
CO 5	2	3	3	3	2
AVERAGE	2	3	3	2	3

SEMESTER IV

RESOURCE MANAGEMENT TECHNIQUES

TOTAL HOURS: 90

COURSE CODE: 176120

CREDITS: 4

L-T-P: 4-2-0

COURSE OBJECTIVES:

- The course emphasizes the application of Operations Research for solving business problems.
- Throughout this course, students are expected to know and understand common and important business problems.
- Students will develop problem modeling and solving skills
- To learn how to make intelligent business decisions from the point of view of optimization.
- Aims at familiarizing the students with quantitative tools and techniques which are frequently applied decision making.

COURSE OUTLINE:

Unit 1:	Markovian Decision Process Scope of the Markovian Decision Problem – Gardner Example – Finite Stage Dynamic Programming Model – Infinite Stage Model – Linear Programming Solution. Chapter 19 : Section 19.1 – 19.4	18 Hrs
Unit 2:	Network Analysis Network Definitions – Minimal Spanning Tree Algorithm – Shortest route problem – Maximum Flow Model Chapter 11: Section 6.1 – 6.5	18 Hrs
Unit 3:	Inventory Theory Basic Elements of an inventory Model – Deterministic models of the following types: Single Item static model with and without price breaks, multiple item static model with storage limitation. Chapter 11: Section 11.1 – 11.3	18 Hrs
Unit 4:	Inventory Theory (Continued) Probabilistic models: Continuous Review Model – Single period model Chapter 16: Section 16.1 – 16.3	18 Hrs
Unit 5:	Queuing Theory Basic elements of a queuing Model – Role of Poisson and Exponential Distributions – Pure birth and death models – Specialized Poisson Queues – M/G/I queue – Pollaczek– Khintchine Formula Chapter 17: Sections 17.2 – 17.7(Omit 17.6.4)	18 Hrs

RECOMMENDED TEXT BOOKS:

Operations Research, Hamdy A. Taha, (Sixth Edition) Prentice Hall of India Private Limited, New Delhi, 1997.

BOOKS FOR REFERENCE:

1. Goel, B.S. & Mittal, S.K.: Operations Research, Pragati Prekshen, John & Sons.
2. Introduction to Operations Research, F.S. Hillier and J. Lieberman (7th Edition) Tata McGraw Hill Publishing Company, New Delhi, 2001.
3. Foundations of Optimization, Beightler, C., O. Phillips, B. Wilde, (2nd Edition) Prentice Hall Pvt. Ltd., New York, 1979.
4. Linear Programming and Network Flow, Bazaraa, M.S., J.T. Jarvis, H.D. Sharall, John Wiley & Sons, New York, 1990.
5. Fundamentals of queueing Theory, Gross, D and C.M. Harris, (3rd Edition), Wiley and sons, New York 1998.

JOURNALS:

Journal of the operations Research society of America

Mathematical methods of operations Research - Springer

E-LEARNING RESOURCES:

1. [www.mathforum.org>home>mathtopics](http://www.mathforum.org/home/mathtopics)
2. [www.du.ac.in>page=m-sc-operationalResearch](http://www.du.ac.in/page=m-sc-operationalResearch)
3. [Freecomputerbooks.com>specialoperationresearchbook](http://Freecomputerbooks.com/specialoperationresearchbook)

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Cultivate an ability to perform accurate self-assessment of their work.
CO 2	Learn how and when to apply optimality conditions for practical problem solving.
CO 3	Learn and apply algorithmic and computational techniques for solving mathematical programs, particularly non-linear.
CO 4	Have skills in numeracy and quantitative method
CO 5	Develop the ability to identify the analytical challenges of a specific problem, and the ability to identify the appropriate OR technique to solve it.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	2	3
CO 2	3	3	3	2	3
CO 3	3	3	3	2	3
CO 4	2	2	2	2	2
CO 5	2	3	3	3	2
AVERAGE	2	3	3	2	3

**SEMESTER IV
FLUID DYNAMICS**

TOTAL HOURS: 75
CREDITS: 3

COURSE CODE:176122
L-T-P:4-1-0

COURSE OBJECTIVES:

- To explore the foundations of dynamics at a level and depth appropriate for someone aspiring to study higher-level mathematics and/or to become a professional mathematician.
- To present an introduction to the field of Mechanics, with emphasis on those aspects of the subject that are basic to higher mathematics.
- Students will learn the fundamentals of Fluid Dynamics.
- To introduce the student to what it means to do mathematics, as opposed to learning about mathematics or to learning to do computational exercises.
- To help the student learn how to write mathematical text according to the standards of the profession.

COURSE OUTLINE:

Unit 1: Kinematics of fluids in motion: Real fluids and ideal fluids – velocity of a fluid at a point, Stream lines. Path lines, steady and unsteady flows – velocity potential – The Vorticity Vector – Local and particle rates of changes – Equations of continuity – Worked examples – Acceleration of a fluid – conditions at a rigid boundary.

Chapter 2: Section 2.1 to 2.10 **15 hrs**

Unit 2: Equations of motion of fluid: Pressure at a point in a fluid at rest – pressure at a point in a moving fluid – conditions at a boundary of two invisible immiscible fluids – Euler's equation of motion – Discussion of the case of steady motion under conservation body forces.

Chapter 3: Section 3.1 to 3.7 **15 hrs**

Unit 3: Some Three Dimensional Flows: Introduction – sources, sink and doublets – Images in a rigid infinite plane – Axis symmetric flows – Stokes stream function.

Chapter 4: Sections 4.1,4.2,4.3,4.5 **10 hrs**

Unit 4: Some Two Dimensional Flows: Meaning of two dimensional flow – use of Cylindrical polar coordinate – application only – The stream function. The complex potential for two dimensional, irrotational in – compressible flow – complex velocity potential for standard two dimensional flows – some worked examples – Two dimensional image systems – The Milne –Thompson Circle Theorem.

Chapter 5: Sections 5.1 to 5.8 **10 hrs**

Unit 5: Viscous Flows: Stress components in a real fluid – Relations between Cartesian components of stress – Translational motion of fluid elements – The rate of strain quadric and principle stresses – properties of the rate of strain quadric – stress analysis in fluid motion – Relation between stress and rate of strain – The coefficient of viscosity and Laminar flow – The Navier – Stokes equations of motion of a viscous fluid.

Chapter 8: Sections 8.1 to 8.9 **10 hrs**

RECOMMENDED TEXTBOOKS:

Text book of Fluid Dynamics, F. Chorlton, CBS Publications, Delhi. 1985.

REFERENCE BOOKS:

1. Theoretical Hydrodynamics, Milne – Thomson, Macmillan, 1949.
2. Introduction to fluid mechanics, R.W. Fox and A.T.Mcdonold 1985
3. Fluid Mechanics with problems and solutions E.Karause springer 2005
4. Mechanics of Fluids B.S. Massey, NEW YORK 2005
5. Basics of Fluid Mechanics and Introduction to computational Fluid Dynamics by P.Orlandi Berlin2004

E-LEARNING RESOURCES:**COURSE OUTCOMES:**

CO Number	CO STATEMENT
CO 1	Students will know the definitions of standard terms in Dynamics
CO 2	Students will know a variety of examples and counterexamples in Fluid Dynamics
CO 3	Students will know about the fundamental of Source sink and doublet
CO 4	Students will be able to work with new ideas in Two Dimensional Flows.
CO 5	Students will be able to clearly communicate ideas about Viscous fluid.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	2	3
CO 2	2	3	2	2	3
CO 3	2	3	2	2	3
CO 4	2	2	2	2	2
CO 5	2	3	3	3	2
AVERAGE					

QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMEN

(Autonomous) Chennai – 600 002.

PG AND RESEARCH DEPARTMENT OF MATHEMATICS

SYLLABUS
(For UG COURSE)



CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION
(OFFERED FROM THE ACADEMIC YEAR 2018-19)

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Course profile semester II
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Course outline

RULES AND REGULATIONS FOR UG PROGRAMME

1. Duration

- a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semester, the second academic year, the third and fourth semesters and the third academic year, the fifth and sixth semester.
- b. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year.

2. Course of Study

The course of study for bachelor Degree Courses shall comprise of the following:

Foundation Courses: The courses shall comprise the study of:

- iii) Part - I Tamil - 6 Credits for B.A. and B.Sc.; 4 Credits for B.Com.
- iv) Part – II English – 6 Credits for B.A and B.Sc.; 4 Credits for B.Com.

Part III:

- h. Core Subjects (B.A.-79 Credits; B.Sc. - 79 Credits and 91 Credits– B.Com.)
- i. Allied Subjects (20 Credits for B.A., B.Sc., and B.Com.)

Part IV:

- j. Soft Skill (4 Papers) (8 Credits)
- k. Non-Major Elective (2 Papers) (4 Credits)
- l. Environmental Studies (2 Credits)
- m. Value Education (2 Credits)

Part V:

- f. Extension Activities (1 Credit)

3. Compulsory Extension Service

A candidate shall be awarded a maximum of one credit for Compulsory Extension Service. All students shall have to enroll for NSS/NCC/Sports and Games/Rotary/Youth Red Cross or any other service organization in the College and shall have to put in compulsory attendance of 40 hours, which shall be duly certified. If a student lacks 40 hours attendance in the First year, she shall have to compensate the same during the subsequent years.

Students who complete the minimum attendance of 40 hours in One year only will get credit and those who complete the attendance of 80 or more hours in Two years will get I credit.

Distribution of Marks for Continuous Assessment

Part I, Part II and Part III

Test			Best 2 out of 3	Assignment	Seminar / Creative Presentation	Model Exam	Attendance	Total	Reduced to
20	20	20	40	10	15	25	10	100	25

Test (Best two out of three) : 40 Marks

Assignment / Seminar /
Creative Presentation : 25 Marks

Model Examination : 25 Marks

Attendance

90 – 100%	-	10 Marks
80 – 89%	-	9 Marks
75 – 79%	-	8 Marks
65 – 74%	-	7 Marks
55 – 64%	-	5 Marks
Below 55%	-	0 – Not Eligible

Program Outcomes(PO)

The Under Graduate students of Mathematics should be able to

1. PO1 – Apply practical and mathematical skill in all aspects.
2. PO2 – Identify quality knowledge of the subject.
3. PO3 -Utilize the subject knowledge and communication skill to appear for competitive exams.
4. PO4 – Acquire theoretical, practical and mathematical knowledge.
5. PO5- Analyze the basic computational skills.

Program Specific Outcomes(PSO)

The Under Graduate students of Mathematics should be able to

1. PSO1 - Mastering the ideas and techniques of Calculus and Algebra.
2. PSO2 - Learning the foundations of Abstract Algebra, Differential Equations and Probability.
3. PSO3 - Gaining a good understanding of a few major realms of pure and applied mathematics.
4. PSO4 – Have a solid knowledge on elementary statistics.
5. PSO5 – Understand the applications of Operations Research in real life.
6. PSO6 - Gain knowledge about the basic computer applications and communication skills.

7. PSO7 – Have a deep knowledge of real and complex analysis.
8. PSO8 – Be familiar with geometrical shapes in 3D & 2D.

PROGRAMME PROFILE – B.Sc MATHEMATICS

SEM	PART	COURSE CODE	TITLE OF THE PAPER	CREDIT S	HOUR S/WK	TOTAL HOURS	CA	SE	TOTAL
I	III	172101	ALGEBRA	5	6	90	25	75	100
I	III	172102	CALCULUS	5	6	90	25	75	100
I	III	172191	CALCULUS OF FINITE DIFFERENCES AND NUMERICAL ANALYSIS-I	5	6	90	25	75	100
I	IV		NON MAJOR ELECTIVE-I	2	2	30	40	60	100
I	IV		ESSENTIALS OF LANGUAGE AND COMMUNICATION	2	2	30	40	60	100
II	III	172103	DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	4	6	90	25	75	100
II	III	172104	VECTOR ANALYSIS AND TRIGONOMETRY	4	6	90	25	75	100
II	III	172192	CALCULUS OF FINITE DIFFERENCES AND NUMERICAL ANALYSIS-II	5	6	90	25	75	100
II	IV		NON MAJOR ELECTIVE-II	2	2	30	40	60	100
II	IV		ESSENTIAL OF SPOKEN AND PRESENTATION SKILLS	2	2	30	40	60	100
III	III	172105	DIFFERENTIAL GEOMETRY	4	5	75	25	75	100
III	III	172106	ANALYTICAL GEOMETRY OF THREE DIMENSIONS & FOURIER TRANSFORMS	4	4	60	25	75	100
III	III	172193	MATHEMATICAL STATISTICS-I	5	5	75	25	75	100

III	III	172195	MATHEMATICS – I (PHY, CHE, COMP.SCI. FOR ALLIED)	5	5	75	25	75	100
III	IV	179003	PERSONALITY ENRICHMENT	2	2	30	40	60	100
III	IV	174001	ENVIRONMENTAL STUDIES	2	2	30	40	60	100
IV	III	172107	STATICS	4	5	75	25	75	100
IV	III	172108	REAL ANALYSIS-I	4	5	75	25	75	100
IV	III	172194	MATHEMATICAL STATISTICS-II	5	5	75	25	75	100
IV	III	172196	MATHEMATICS – II (PHY, CHE, COMP.SCI. FOR ALLIED)	5	5	75	25	75	100
IV	IV		COMPUTING SKILLS	2	2	30	40	60	100
IV	IV	174001	ENVIRONMENTAL STUDIES	2	2	30	40	60	100
V	III	142109	MODERN ALGEBRA- I	4	6	90	25	75	100
V	III	142110	REAL ANALYSIS-II	4	6	90	25	75	100
V	III	142111	PROGRAMMING LANGUAGE ‘C’ (THEORY)	4	6	90	25	75	100
V	III	142112	DYNAMICS	4	6	90	25	75	100
V	III	142113	ONE FROM THE LIST OF ELECTIVES	5	5	75	25	75	100
V	IV	144003	VALUE EDUCATION	1	1	15	40	60	100
VI	III	142114	MODERN ALGEBRA- II	5	6	90	25	75	100
VI	III	142115	COMPLEX ANALYSIS	5	6	90	25	75	100
VI	III	142116	PROGRAMMING LANGUAGE ‘C’ (PRACTICAL)	4	6	90	25	75	100
VI	III	142117	ONE FROM LIST OF ELECTIVE	5	6	90	25	75	100
VI	III	142118	ONE FROM LIST OF ELECTIVE	5	5	75	25	75	100
VI	IV	144003	VALUE EDUCATION	2	1	15	40	60	100

LIST OF ELECTIVES FOR UG STUDENTS

1. Operations Research – I
2. Operations Research – II

3. Elementary Number Theory
4. Astronomy
5. Graph Theory
6. Partial Differential Equations with Applications

EVALUATION PATTERN FOR CONTINUOUS ASSESSEMENT – UG

INTERNAL VALUATION BY COURSE TEACHER/S

PART I,II AND III – THEORY PAPERS

COMPONENT	TIME	MAX.MARKS	CA MARK
1. TEST I	1 HR	25 MARKS (TO BE CONVERTED)	20
2. TEST II	1 HR	25 MARKS (TO BE CONVERTED)	20
3. MODEL EXAMINATION	3 HR	75 MARKS (TO BE CONVERTED)	25
4. ASSIGNMENT/SEMINAR/ FIELD VISIT			25
5. ATTENDANCE			10
		TOTAL	100

PART III – PRACTICAL PAPERS

COMPONENT	TIME	MAX.MARKS	CA MARK
1. TEST I	1 HR	25 MARKS (TO BE CONVERTED)	20
2. TEST II	1 HR	25 MARKS (TO BE CONVERTED)	20
3. MODEL EXAMINATION	3 HR	75 MARKS (TO BE CONVERTED)	25
4. ASSIGNMENT/SEMINAR/FIELD VISIT			25
5. ATTENDANCE			10
		TOTAL	100

PART IV – SKB/SOFT SKILLS

COMPONENT	TIME	MAX.MARKS	CA MARK
1. TEST I	1 HR	10	10
2. ASSIGNMENT		10	10
3. PRESENTATION SKILLS		20	20
		TOTAL	40

CA QUESTION PAPER PATTERN – UG

Knowledge Level	Section	Word Limit	Marks	Total
K1	A-5/6X2 Marks	50	10	25
K1,K2	B-1/2X5 Marks	200	5	
K2,K3	C-1/2X10 Marks	500	10	

CA QUESTION PAPER PATTERN FOR PART IV – UG

Knowledge Level	Section	Word Limit	Marks	Total
K2, k3	A-4/5X5Marks	500	20 (To be converted)	10

RUBRICS FOR CONTINUOUS ASSESSMENT

Assignment	Content/originality/Presentation/Schematic Representation and Diagram/Bibliography
Seminar	Organisation/Subject Knowledge/ Visual Aids/ Confidence level/presentation – Communication and Language
Field Visit	Participation/Preparation/Attitude/Leadership
Participation	Answering Questions/ Clearing Doubts/ Participating in Group Discussions/ Regular Attendance
Case Study	Finding the problem/ analysis/ Solution/ Justification
Problem Solving	Understanding Concepts/ Formula and variable Identification / Logical Sequence/ Answer
Group Discussion	Preparation/ Situation Analysis/ Relationship Management/ Information Exchange/ Delivery skills
Flipped/ blended Learning	Preparation/ Information Exchange/ Group interaction/ Clearing doubts

END SEMESTER EVALUATION PATTERN – UG

THEORY PAPERS

PART III

SEMESTER I/II/III/IV/V/VI

VALUATION BY EXTERNAL EXAMINER

MAXIMUM MARKS: 75

PASSING MARK: 30

PART IV

SINGLE VALUATION

ORAL TEST/WRITTEN TEST

MAXIMUM MARKS: 60

PASSING MARK:24

PRACTICAL PAPERS

PART III

SEMESTER I/II/III/IV/V/VI

DOUBLE VALUATION BY COURSE TEACHER AND EXTERNAL EXAMINER

MAXIMUM MARKS: 75

PASSING MARK: 30

SEMESTER I COURSE PROFILE – PROGRAMME OF STUDY - UG

COURSE CODE	TITLE OF THE PAPER	CREDIT S	HOURS / WK	TOTAL HOUR S	L-T-P	CA	SA	TOT AL
172101	ALGEBRA	5	6	90	4-2-0	25	75	100
172102	CALCULUS	5	6	90	4-2-0	25	75	100
172191	CALCULUS OF FINITE DIFFERENCES AND NUMERICAL ANALYSIS-I	5	6	90	4-2-0	25	75	100
	NON MAJOR ELECTIVE-I	2	2	30	2-0-0	40	60	100
	ESSENTIALS OF LANGUAGE AND COMMUNICATION	2	2	30	2-0-0	40	60	100
	TOTAL							
	TOTAL CREDITS	19						

SEMESTER II COURSE PROFILE – PROGRAMME OF STUDY - UG

COURSE CODE	TITLE OF THE PAPER	CREDIT S	HOURS / WK	TOTAL HOUR S	L-T-P	CA	SA	TOT AL
172103	DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	4	6	90	4-2-0	25	75	100
172104	VECTOR ANALYSIS AND TRIGONOMETRY	4	6	90	4-2-0	25	75	100
172192	CALCULUS OF FINITE DIFFERENCES AND NUMERICAL ANALYSIS-II	5	6	90	4-2-0	25	75	100
	NON MAJOR ELECTIVE-II	2	2	30	2-0-0	40	60	100
	ESSENTIAL OF SPOKEN AND PRESENTATION SKILLS	2	2	30	2-0-0	40	60	100
	TOTAL							

	TOTAL CREDITS	17						

SEMESTER III COURSE PROFILE – PROGRAMME OF STUDY - UG

COURS E CODE	TITLE OF THE PAPER	CREDI TS	HOURS/ WK	TOTA L HOUR S	L-T-P	CA	SA	TOT AL
172105	DIFFERENTIAL GEOMETRY	4	5	75	4-1-0	25	75	100
172106	ANALYTICAL GEOMETRY OF THREE DIMENSIONS & FOURIER TRANSFORMS	4	4	60	3-1-0	25	75	100
172193	MATHEMATICAL STATISTICS-I	5	5	75	4-1-0	25	75	100
172195	MATHEMATICS – I (PHY, CHE, COMP.SCI. FOR ALLIED)	4	5	75	4-1-0	25	75	100
179003	PERSONALITY ENRICHMENT	2	2	30	2-0-0	40	60	100
174001	ENVIRONMENTA L STUDIES	2	1	15	1-0-0	40	60	100
	TOTAL							
	TOTAL CREDITS	21						

SEMESTER IV COURSE PROFILE – PROGRAMME OF STUDY - UG

COURS E CODE	TITLE OF THE PAPER	CREDIT S	HOURS / WK	TOTA L HOUR S	L-T-P	CA	SA	TOT AL
172107	STATICS	4	5	75	4-1-0	25	75	100
172108	REAL ANALYSIS-I	4	5	75	4-1-0	25	75	100
172194	MATHEMATICAL STATISTICS-II	5	5	75	4-1-0	25	75	100
172196	MATHEMATICS – II (PHY, CHE, COMP.SCI. FOR ALLIED)	4	5	75	4-1-0	25	75	100
	COMPUTING SKILLS	2	2	30	2-0-0	40	60	100

174001	ENVIRONMENTAL STUDIES	2	2	30	2-O-0	40	60	100
	TOTAL							
	TOTAL CREDITS	21						

SEMESTER V COURSE PROFILE – PROGRAMME OF STUDY - UG

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS/ WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
142109	MODERN ALGEBRA-I	4	6	90	4-2-0	25	75	100
142110	REAL ANALYSIS-II	4	6	90	4-2-0	25	75	100
142111	PROGRAMMING LANGUAGE 'C' (THEORY)	4	6	90	4-2-0	25	75	100
142112	DYNAMICS	4	6	90	4-2-0	25	75	100
142113	ONE FROM THE LIST OF ELECTIVES	5	5	75	4-1-0	25	75	100
144003	VALUE EDUCATION	2	1	15	1-0-0	40	60	100
	TOTAL							
	TOTAL CREDITS	23						

SEMESTER VI COURSE PROFILE – PROGRAMME OF STUDY - UG

COURS E CODE	TITLE OF THE PAPER	CREDIT S	HOURS / WK	TOTAL HOUR S	L- T-P	CA	SA	TOT AL
142114	MODERN ALGEBRA-II	5	6	90	4- 2-0	25	75	100
142115	COMPLEX ANALYSIS	5	6	90	4- 2-0	25	75	100
142116	PROGRAMMING LANGUAGE 'C' (PRACTICAL)	4	6	90	4- 2-0	25	75	100
142117	ONE FROM LIST OF ELECTIVE	5	6	90	4- 2-0	25	75	100
142118	ONE FROM LIST OF ELECTIVE	5	5	75	4- 1-0	25	75	100
144003	VALUE EDUCATION	2	1	15	1- 0-0	40	60	100
	TOTAL							
	TOTAL CREDITS	26						

Courses outlines -UG

SEMESTER I

ALGEBRA

TOTAL HOURS: 90
CREDITS: 5

COURSE CODE: 17210 1
L-T-P : 4-2-0

COURSE OBJECTIVES:

1. This course aims to provide a first approach to the subject of algebra, which is one of the basic pillars of modern mathematics
2. Algebra gives the students a good mathematical maturity and enables to build mathematical thinking and skills
3. The students are exposed to topics in theory of equations and problem solving skills

COURSE OUTLINE:

- UNIT 1 : Theory of Equations:** Polynomial Equations, Imaginary and Irrational roots, Symmetric functions of the roots in terms of coefficients, Sum of the powers of the roots of an equation, Transformations of Equations, Reciprocal Equations.
[Algebra vol.I, Page 282-333 ,Sec 1-18] 18hrs
- UNIT 2 : Theory of Equations:**Descarte's Rule of signs, Rolles theorem and Horner's method [Algebra vol. I, Page 351-357, Sec 24,25,30] 18hrs
- UNIT 3 : Matrices :** Eigen values and Eigen vectors, Diagonalization of a matrix, Cayley – Hamilton theorem. [Algebra vol. II, Page 110-122 ,Sec 16-16.1-16.6] 18hrs
- UNIT 4 : Theory of Numbers :** Prime and Composite numbers, Divisors of a given number N , Euler's functions $\phi(N)$, Integral part of a real number, The highest power of a prime p contained in $n!$ [Algebra vol. II, page 218-232, sec 1-11] 18hrs
- UNIT 5 :** Congruences, Fermat's Theorem, Wilson's Theorem. [Algebra vol. II, page 234-252, sec 12-17] 18hrs

RECOMMENDED TEXTBOOKS:

- 1.Algebra – Volume I & II by T.K.ManicavachagamPillay and others.
(S.Viswanathan Publications)

REFERENCE BOOKS:

1. Algebra & Trigonometry – Volume I & II by P.R.Vittal&V.Malini – Margam Publishers.

JOURNALS:

1. Journal of Algebra – Elsevier (www.journals.elsevier.com)
2. International Journal of number theory – World Scientific (www.worldscientific.com)

E-LEARNING RESOURCES:

1. <https://www.qc.sdu.hk>
2. <https://www.qc.sdu.hk>
3. <https://ece.uwaterloo.ca>
4. www.topcoder.com
5. ramanujan.math.trinity.edu

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Students will understand the technique of solving polynomial equations, symmetric function of roots, Transformations of equations and Reciprocal equations
CO 2	Find the nature of roots of a given equation using Descarte's Rule and Rolle's theorem
CO 3	Determine whether the given matrix satisfies the Cayley-Hamilton theorem. Find the characteristic equation, eigen values and corresponding eigen vectors of a given matrix and determining its diagnosability.
CO 4	Demonstrate knowledge and understanding of topics such as prime and composite numbers, Euler's function and finding divisor of N and Integral part of a real numbers
CO 5	Study the Fermat's theorem and Wilson's theorem and learn methods and techniques used in Number theory

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2.2	2.2

SEMESTER I CALCULUS

TOTAL HOURS: 90
CREDITS: 5

COURSE CODE: 172102
L-T-P: 4-2-0

COURSE OBJECTIVES:

- 1.To introduce the fundamental concepts of Derivatives and apply the basic rules of differentiation to find the derivative of functions.
- 2.To evaluate integrals using the properties of beta and gamma functions.
- 3.To acquire knowledge in the areas of Differential and Integral Calculus.

COURSE OUTLINE:

- UNIT 1 : Successive Differentiation :** The n^{th} derivative, Standard results, Trigonometric transformation, Formation of equations involving derivatives, Leibnitz formula for the n^{th} derivative of a product(without proof)
[Calculus, Vol- I, Page No :69 – 87] 18 hrs
- UNIT 2 : Total Differential Coefficient :** A special case , Implicit functions homogenous functions, Euler's theorem (without proof) , Maxima and Minima of functions of two variables, Working rule, Lagrange's method of undetermined multipliers and Jacobians.
[Calculus, Vol-I, Page No.188-204, 222-240]
[Allied Mathematics, Page No.246-251] 18 hrs
- UNIT 3 : Beta and Gamma functions:** Definitions, recurrence formula of Gamma functions, properties of Beta functions. Relation between Beta and Gamma functions. Examples [Volume 2: Page No: 270-300.] 18 hrs
- UNIT 4 : Multiple Integrals:** Definition of the double Integral, Examples, Double Integral in Polar coordinates, Examples, [problems only] [Volume 2: Page no: 203-219] 18 hrs
- UNIT 5 : Triple Integrals:** Example Applications of Multiple Integrals- Examples. Volume as a triple integral, Area of curved surfaces – Examples – [Problems only] [Volume 2: Page no: 219-234,238-250]. 18 hrs

RECOMMENDED TEXTBOOKS:

1. Calculus, Volume 1 by S. Narayanan and T.K. ManicavachagamPillay, 2016, S.Vishwanathan Printers & Publishers.
2. Jacobians : Allied Mathematics by P.Kandasamy and K.Thilavathy (for Unit 1 & 2)
3. Calculus, Volume 2 by S.Narayanan and T.K.ManicavachagamPillay(for Unit 3,4 & 5), 2016, S.Vishwanathan Printers & Publishers.

REFERENCE BOOKS:

1. Kandasamy.P and K. Thilagavathi, Mathematics for B.Sc., - Volume II- 2004, S.Chand& Co. New Delhi.

2. Calculus, P.R. Vittal and V. Malini, Margham Publications, 2010
3. A text of calculus, DR.K.C. Sinha
4. Fundamentals of calculus, Carla C. Morris and Robert M. Stark, Wiley.
5. Calculus and its applications, Goldstein Lay Schneider Asmar.

JOURNALS:

1. Federer, H.: Some Theorems on Integral Currents, Trans. Am. Math. Soc. 117, 43-67 (1965).
2. Introducing Differential Calculus A. Graham, G.A. Read & V. King.

E-LEARNING RESOURCES:

1. <http://www.coursehero.com> > file
2. <http://ocw.mit.edu> > Mathematics
3. <http://www.oreilly.com> > chapter006
4. <http://metacademy.org> > concepts
5. tutorial.math.lamar.edu

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Provide understanding of existence of nth order derivative
CO 2	Discuss the Lagrange's multiplier method to find extreme of functions with constraints
CO 3	Apply the properties of Beta and Gamma function to evaluate integrals
CO 4	Evaluate double integrals
CO 5	Demonstrate applications of Triple integrals

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	3	2
CO 2	3	2	2	2	3
CO 3	2	3	3	2	2
CO 4	3	2	3	3	2
CO 5	2	2	2	2	3
AVERAGE	2.4	2.4	2.4	2.4	2.4

SEMESTER I
CALCULUS OF FINITE DIFFERENCE AND NUMERICAL ANALYSIS – I

TOTAL HOURS: 90
CREDITS: 5

COURSE CODE: 172191
L-T-P: 4-2-0

COURSE OBJECTIVES:

1. To provide students with an introduction to the field of numerical analysis
2. Derive appropriate numerical techniques to solve interpolation problems in equal intervals and unequal intervals.
3. To provide basic methods for finding finite differences.

COURSE OUTLINE:

- UNIT 1** : Solutions of Algebraic and Transcendental equations, Bisection method, Iteration method, RegulaFalsi method, Newton- Raphson method.
[Page no. 1-29] 18 hrs
- UNIT 2** : Solution of simultaneous linear equations, Gauss- Elimination method, Gauss-Jordan method, Gauss-Siedel method, Crout's method. [Page no. 37-69]
18 hrs
- UNIT 3** : Finite differences, Operators and relation between them, Differences of a polynomial, Factorial polynomial (Differences of Zero), Summation of series.[Page no. 72-93] 18 hrs
- UNIT 4** : Interpolation with equal intervals, Newton's forward and backward interpolation formulae. Central differences formulae- Gauss forward and backward formulae, Stirling's formula and Bessel's formula.
[Page no. 109-145] 18 hrs
- UNIT 5** : Interpolation with unequal intervals; Divided differences, Newton's divided differences formula for interpolation and Lagrange's formula for interpolation, Inverse interpolation, Lagrange's method, (Reversion of series method).[Page no. 157-182] 18 hrs

RECOMMENDED TEXTBOOKS:

Calculus of finite differences & Numerical Analysis by P.Kandaswamy&K.Thilagavathy,
S.Chand&Co., 2003

BOOKS FOR REFERENCE:

1. Numerical Analysis by B.D. Gupta, Konark Publishing
2. Calculus of finite differences and Numerical Analysis – Saxena, Chand & Co.
3. Numerical Methods by A. Singaravelu. Meenakshi Agency

JOURNALS:

1. Numerical operator calculus in Higher dimensions G. Beylkin, MJ Mohlenkamp
2. Weighted average finite difference methods for fractional diffusion equations, SB Yuste

E-LEARNING RESOURCES:

1. [https:// www.elsevier.com](https://www.elsevier.com)> catalog
2. [https:// www.researchgate.net](https://www.researchgate.net) >3
3. [https:// www.sciencedirect.com](https://www.sciencedirect.com)>jou
4. [https:// globaljournals.org](https://globaljournals.org)>jou
5. [https:// onlinelibrary.wiley.com](https://onlinelibrary.wiley.com)>jou

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Compute the solutions of Algebra and Transcendental equations
CO 2	Provide solution to simultaneous linear equations
CO 3	Develop operators in the context of finite Differences
CO 4	Demonstrate various Interpolation methods in equal intervals
CO 5	Analyze Newton divided difference and Lagrange's interpolation and Inverse Lagrange's interpolation formula

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	3	2
CO 2	3	2	2	2	3
CO 3	2	3	3	2	2
CO 4	3	2	3	3	2
CO 5	2	2	2	2	3
AVERAGE	2.4	2.4	2.4	2.4	2.4

SEMESTER II

DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS

TOTAL HOURS: 90

COURSE CODE: 172103

COURSE OBJECTIVES:

1. To expose the basic ideas of differential equations
2. To provide solution to first order differential equations
3. To learn techniques for Solving Ordinary differential equation with constant coefficients, variable coefficients and also Laplace transforms

COURSE OUTLINE:

- UNIT 1** : Equations of first order, but of higher degree – Equations solvable for $\frac{dy}{dx}$ – Equations solvable for y & x – Particular cases – Clairaut's form Equations that do not contain x explicitly. Linear equation with constant coefficients: Definitions – The operator D – Complementary function of a linear equation with constant coefficients – Particular integral. [Page no. 60-88] 18 hrs
- UNIT 2** : Linear equation with variable coefficient–Linear equations of the second order – Complete solution given a known integral – Reduction of the normal form – Change of the independent variable – Variation of parameters. Total differential equations–criterion of integrability–Rule for integrating – Method of grouping [Page no. 89-96, 145-160, 211-218] 18 hrs
- UNIT 3** : Partial Differential Equations of first order – Classification of integrals, singular integral, general integral – Derivation of partial differential equations–Lagrange's method of solving the linear equation – Special methods, standard forms – Charpit's method. [Page no. 219-247] 18 hrs
- UNIT 4** : Laplace Transforms – Definition – Piecewise continuity – Results based on definition – Laplace Transform of periodic functions – Some general theorem. [Page no. 161-177] 18 hrs
- UNIT 5** : The Inverse Laplace Transform – Results – Solving ordinary differential Equations with constant coefficients using Laplace transforms – Solving system of differential equations – Solving differential equation with variable coefficients – Solving equations involving integrals. [Page no. 178-199] 18 hrs

RECOMMENDED TEXTBOOKS:

1. Differential Equations and its Applications by S.Narayanan& T.K. Manicavachagam Pillay, S.Viswanathan (Printers & Publishers) Pvt. Ltd. 2010

REFERENCE BOOKS:

- 1.Differential Equations & Laplace Transforms, A.Singaravelu&R.Rama, Meenakshi Agency.
- 2.Laplace& Fourier Transforms, Goyal, Gupta, A pragathi edition.
- 3.Differential Equation by Meghasharma, Department Science, Biyani Girls College, Jaipur.
- 4.2500 solved problems in Differential Equations Richard BRONSON
- 5.Handbook of Differential Equations Daniel, Zwillinger

JOURNALS:

1. Journal of Differential Equations (www.journals.elsevier.com)
2. International Journal of Differential Equations (www.hindawi.com)

E-LEARNING RESOURCES:

1. www.gurukpo.com
2. www.math.utah.edu
3. www.scribd.com
4. www.math.psu.edu
5. <https://ipsa.swarthmore.sdu>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Acquire knowledge of Linear, Nonlinear, Partial and Ordinary Differential Equations
CO 2	Gain working knowledge of basic application problems described by second order linear Differential Equations with constant coefficient
CO 3	Solve Differential Equation with constant coefficient by variation of parameters
CO 4	Familiarize with the various techniques of finding the solution of the Differential Equation $\frac{dx}{p} = \frac{dy}{q} = \frac{dz}{r}$ and acquire the idea of Lagrange's method for solving Partial Differential Equations
CO 5	Determine the solution for Differential Equation using Laplace Transforms and Laplace Inverse Transforms

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2.2	2.2

SEMESTER II VECTOR ANALYSIS AND TRIGONOMETRY

TOTAL HOURS: 90

COURSE CODE: 172104

CREDITS: 4

L-T-P: 4-2-0

COURSE OBJECTIVES:

- 1.To discuss the fundamental theorem of line integral ,gradient and vector integration.
- 2.To cover topics on expansions of Trigonometric functions and Hyperbolic functions.
- 3.To demonstrate the applications of Theorems of Gauss Divergence, Greens and Stroke's theorems

COURSE OUTLINE:

- UNIT 1** : Vector Differentiation: Gradient, Direction and Magnitude of gradient, Divergence and curl, Formulae involving operators ∇ , operators involving ∇ Twice [Page no.7-33] 18 hrs
- UNIT 2** : Vector Integration : Line Integral, Theorem (Necessary & sufficient condition that the line integral is independent of path) Volume Integral, Surface integral and Evaluation of the surface integral [Page no.49-65] 18 hrs
- UNIT 3** : Theorems of Gauss Divergence, Greens, Stroke's (without proof and simple problems only) [Page no.66-95] 18 hrs
- UNIT 4** : Expansions of $\cos n\theta$, $\sin n\theta$, Expansion of $\tan n\theta$ in powers of $\tan \theta$, Powers of sines and cosines of θ in terms of functions of multiples of θ , Expansions of $\cos^n \theta$, $\sin^n \theta$, when n is a +ve integer, Expansions of $\sin \theta$ and $\cos \theta$ in a series of ascending powers of θ . [Page no.61 – 68,77-92] 18 hrs
- UNIT 5** : Hyperbolic functions, Inverse hyperbolic function (Pg 93 – 108) Logarithms of complex quantities general value of Logarithm of $x+iy$. [Page no.122-130] 18 hrs

RECOMMENDED TEXTBOOKS:

1. Vector Analysis by S.Narayanan&T.K.Manicavachagampillay, S.Viswanathan (Printers and Publishers) Pvt.Ltd (For units I,II,II)
2. Trigonometry by S.Narayanan&T.K.Manicavachagampillay, S.Viswanathan (Printers and Publishers) Pvt.Ltd (For units IV & V)

REFERENCE BOOKS:

1. Duraipandian.P and LaxmiDuraipandian – Vector Analysis (Revised Edition – Reprint 2005) Emerald Publishers.

JOURNALS:

1. A history of vector Analysis,MichaelJ.crowe
2. Isometric reflection vectors and characterization of Hilbert spaces.

E-LEARNING RESOURCES:<https://onlinelibrary.wiley.com><https://www.scitechnol.com><https://www.scimagojr.com><https://sites.google.com>**COURSE OUTCOMES:**

CO Number	CO STATEMENT
CO 1	Understand basic concepts of directional derivative and gradient and illustrate geometric meanings.
CO 2	Compute line Integrals, volume integrals and surface
CO 3	Explain the concept of vector integration in solving problems using Gauss Divergence, Greens and Stroke's theorems
CO 4	Distinguish the Powers of sines and cosines of θ in terms of functions of multiples of θ and compute Expansions of $\cos^n \theta$, $\sin^n \theta$, when n is a +ve integer,
CO 5	Discuss Hyperbolic functions, Inverse hyperbolic function

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	2
CO 2	3	2	2	3	3
CO 3	2	2	2	2	2
CO 4	2	3	3	2	2
CO 5	2	3	2	3	2
AVERAGE	2.2	2.4	2.2	2.4	2.2

SEMESTER II**CALCULUS OF FINITE DIFFERENCE AND NUMERICAL ANALYSIS – II****TOTAL HOURS: 90****CREDITS: 5****COURSE CODE: 172192****L-T-P: 4-2-0****COURSE OBJECTIVES:**

1. To provide students with an introduction to numerical differentiation and integration
2. To derive appropriate numerical methods to solve interpolation problems

3. To provide the numerical techniques of solving ordinary differential equations.

COURSE OUTLINE:

- UNIT 1:** Numerical Differentiation – Derivatives using Newton’s forward and backward formula, Stirling’s formula. Derivatives using divided difference formula, Maxima and Minima using the above formulae. [Page no. 187-204].
18 hrs
- UNIT 2:** Numerical Integration-General quadrature formula, Trapezoidal rule, Simpson’s $1/3^{\text{rd}}$ rule, Simpson’s $3/8^{\text{th}}$ rule, Weddle’s rule, Euler - Maclaurin summation formula, Stirling’s formula for $n!$ [Page no. 205-235].
18 hrs
- UNIT 3:** Difference Equations- Linear homogeneous and non – homogeneous difference equations with constant coefficients ; particular Integrals for x^m , a^x , $a^x F(x)$, $\sin kx$, $\cos kx$ [Page no. 236-261].
18 hrs
- UNIT 4:** Numerical solution of ordinary differential equations (First order only) Taylor’s series method, Picard’s method, Euler’s method, Modified Euler’s method. [Page no. 262-288].
18 hrs
- UNIT 5:** RungeKutta Method (4^{th} Order) , Millne’s Predictor- Corrector Method [Page no. 292-310].
18 hrs

RECOMMENDED TEXTBOOKS:

Calculus of finite differences & Numerical Analysis by P.Kandaswamy&K.Thilagavathy, S.Chand&Co., 2003

BOOKS FOR REFERENCE:

1. Numerical Analysis by B.D. Gupta, Konark Publishing

2. Calculus of finite differences and Numerical Analysis – Saxena, Chand & Co.
3. Numerical Methods by A. Singaravelu. Meenakshi Agency

JOURNALS:

1. Numerical operator calculus in Higher dimensions G. Beylkin, MJ Mohlenkamp
2. Weighted average finite difference methods for fractional diffusion equations, SB Yuste

E-LEARNING RESOURCES:

1. [https:// www.elsevier.com](https://www.elsevier.com) > catalog
2. [https:// www.researchgate.net](https://www.researchgate.net) >
3. [https:// www.cfd.online.com](https://www.cfd.online.com) > links
4. [https:// www.scimagojr.com](https://www.scimagojr.com) > journals
5. [https:// onlinelibrary.wiley.com](https://onlinelibrary.wiley.com) > journals

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Apply formulas to solve numerical differentiation problems.
CO 2	Derive Simpson's 1/3, 3/8 rule and trapezoidal rule for solving integrals.
CO 3	Explain the summation of series using finite difference techniques
CO 4	Deal with solutions of Difference equations
CO 5	Gain the knowledge of Runge-Kutta method and Milne's predictor and corrector method.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	3	2
CO 2	3	2	2	2	3
CO 3	2	3	3	2	2
CO 4	3	2	3	3	2
CO 5	2	2	2	2	3
AVERAGE	2.4	2.4	2.4	2.4	2.4

SEMESTER III DIFFERENTIAL GEOMETRY

TOTAL HOURS: 75 HRS
CREDITS: 4

COURSE CODE: 172105
L-T-P: 4-1-0

COURSE OBJECTIVES:

1. To study the concept of polar-coordinated and envelope
2. Finding the radius of curvature and centre of curvature, Evolute and Involute
3. To understand the concepts of Asymptote and obtain their equations

COURSE OUTLINE:

- Unit I :** **Polar co-ordinates:** Angle between the radius vector and the tangent, to find the slope of the tangent in polar co-ordinates, to find the angle of intersection of two curves C and C' whose equations are given in polar co-ordinates, polar sub tangent and polar subnormal, length of arc in polar co-ordinates.
(Chapter IX , page 267-280, sec 4.2 - 4.6) 15 Hrs
- Unit II:** **Envelope:** Method of finding the Envelope, Envelope of one parameter family of curves, Envelope of $f(x,y,t) = 0$ where the parameter t is quadratic, Envelope of two parameter family- problems.
(Chapter X, page 281-291, sec 1.1 – 1.4) 15 Hrs
- Unit III:** **Curvature:** Circle, radius and centre of curvature, Cartesian formula for the radius of curvature, the co-ordinates of the centre of curvature- problems.
(Chapter X, page 291-309, sec 2.1 – 2.4) 15 Hrs
- Unit IV:** **Evolute and Involute:** Radius of curvature when the curve is given in polar co-ordinates, p-r equation; pedal equation of a curve, Chord of curvature – problems.
(Chapter X, page 309-323, sec 2.5 – 3.1) 15 Hrs
- Unit V:** **Linear Asymptotes:** Definition, to find the equations of the asymptotes of a plane algebraic curve, Asymptotes parallel to the axis, special cases, another method for finding asymptotes, Asymptotes by inspection, intersections of a curve with its asymptotes - problems.
(Chapter XI, page 324-341, sec 1 - 7) 15 Hrs

RECOMMENDED TEXTBOOKS:

Calculus -Volume I by S. Narayanan and T. K. Manicavachagam Pillay, S.Viswanathan (Printers & Publishers) Pvt. Ltd.

REFERENCE BOOKS:

1. Calculus and Differential Geometry by A. Singaravelu& R. Rama - Meenakshi Agency.
2. Differential Geometry by PR Vital and Malini
3. Elements of Differential Geometry, R.S.millman and G.D.Parker
- 4.

JOURNAL:

1. International Journal of mathematics education in Science and Technology

www.tandfonline.com

2. International journal of education in Mathematics, Science and Technology
<https://ijemst.net/index.php/ijemst>

E-LEARNING RESOURCES:

<https://www.emathzone.com>

<https://ocw.mit.edu/courses/mathematics>

<https://faculty.etsu.edu/gardnerr/4127/noteshtm>

<https://khanacademy.org/>

math.fsu.edu/virtual

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Finding angle between the radius vector and tangent, slope of the tangent, angle of intersections in polar coordinates
CO 2	Obtain envelope of the given curve
CO 3	Obtain radius and centre of curvature.
CO 4	Finding evolutes of any given curve.
CO 5	Finding asymptotes of any given curve

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	3	2
CO 3	2	2	2	2	2
CO 4	2	2	2	2	2
CO 5	3	2	2	2	2
AVERAGE	2.2	2	2.2	2.2	2.2

SEMESTER III

**ANALYTICAL GEOMETRY OF THREE DIMENSIONS AND FOURIER
TRANSFORMS**

TOTAL HOURS: 75

172106

CREDITS: 4

COURSE CODE:

L-T-P: 4-1-0

COURSE OBJECTIVES:

1. To derive equations of planes in intercept, normal and general forms.
2. To discuss the concepts of a Sphere & its property
3. To acquire knowledge of mathematical concepts underlying the Cone & Cylinder,

COURSE OUTLINE:

- UNIT 1:** Plane – Equation of plane- General form, intercept form, normal form, plane passing through three points. Direction cosines of the line which is perpendicular to a plane, angle between the planes, the ratio in which the plane divides the line joining the points, equation of a plane through the line of intersection of two given planes, length of perpendicular. Straight line - Condition for two straight lines to be coplanar, shortest distance between two lines. [For all the above topics, statements only (without proof) and simple problems]. 15 hrs
- UNIT 2:** Sphere – Equation of a Sphere, the length of the tangent from a point to a sphere, plane section of a sphere, equation of a sphere passing through a given circle, intersection of two spheres, equation of the tangent plane to a sphere. [For all the above topics, statements only (without proof) and simple problems]. 15 hrs
- UNIT 3:** Cone – Equation of a cone, right circular cone, tangent plane and normal, Condition for the plane to touch the quadric cone. [For all the above topics, statements only (without proof) and simple problems]. 15 hrs
- UNIT 4:** Equation of a Cylinder, Right circular cylinder. Fourier Transforms – Infinite Fourier transforms (complex form, statement only) - simple properties of Fourier transforms. 15 hrs
- UNIT 5:** Convolution Theorem, Parseval's Identity, infinite Fourier Sine and Cosine transforms. 15 hrs

RECOMMENDED TEXTBOOKS:

1. Analytical Geometry of Three Dimensions, T.K. Manichavachagam Pillay & others, S. Viswanathan, Revised edition 1996.
Unit 1: Chapter II, Page Nos 24 to 40, Chapter III, Page Nos 61 to 75.
Unit 2: Chapter IV, Page Nos. 92 to 114
Unit 3: Chapter V, Page Nos. 115 to 128 & 132 to 134
Unit 4: Chapter V, Page Nos. 134 to 139
2. Mathematics For B.Sc. Branch- I, Volume IV by P.Kandasamy & K.Thilagavathi, S.Chand & Company LTD, **First Edition 2005**
Unit 4: Chapter 2, Page Nos. 196 to 207
Unit 5: Chapter 2, Page Nos. 208 to 226

REFERENCE BOOKS:

1. Analytical Geometry – 3D (1975) ,P.Duraipandian and Laxmi Duraipandian, Emerald Publisher's, Chennai.
2. BP Lathi, "Digital and Analog communication systems", 4th edition oxford university Press, 2000.
3. A.V. Oppenheim et al, "signals and system", 2nd Edition ,pearson 2003.

JOURNALS:

1. Application of Analytical Geometry of the form of gear teeth
2. Enhancing understanding of Analytical Geometry by augmented reality

E-LEARNING RESOURCES:

<https://www.omicsonline.org>
www.scitecpub.com
<https://www.elsevier.com>
<https://www.analyticsvidhya.com>
<http://gradestack.com>

COURSE OUTCOME:

CO Number	CO STATEMENT
CO 1	Explain the basic concepts of plane & angle between the planes,
CO 2	Solve problems on Sphere & Right Circular Cylinder
CO 3	Discuss the topics related to Cone , right circular cone & Quadric Cones
CO 4	Familiarize the concept of Fourier transform & Fourier Series
CO 5	Analyze the Spectral Characteristics of signals using Fourier Analysis

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	3
CO 2	2	3	2	2	2
CO 3	2	3	3	3	2
CO 4	3	2	3	3	3
CO 5	2	2	2	2	3
AVERAGE	2.2	2.4	2.4	2.4	2.6

SEMESTER III
MATHEMATICAL STATISTICS– I

TOTAL HOURS: 75
CREDITS: 5

COURSE CODE: 172193
L-T-P: 4-1-0

COURSE OBJECTIVES:

1. To explain the concept of Probability theory
2. To understand Generating function & its properties
3. To acquire knowledge of Regression and Correlation coefficients.

COURSE OUTLINE:

- UNIT 1:** Basic terminology-Mathematical probability – Some theorems on probability- Addition laws of probability for 2 events- simple problems.
[Page no. 3.4-3.42] 15 hrs
- UNIT 2:** Multiplication laws of probability of events of two events – Independence - Conditional probability - Baye's theorem-simple problems
[Page no. 3.42-3.98] 15 hrs
- UNIT 3:** Random variables (Discrete and Continuous) – Distribution function- Probability mass functions- probability density functions- simple problems Expected values- Moments –Moment generating function- Characteristic function - Chebychev's Inequality – simple problems.
[Page no. 5.2- 5.31, 6.2-6.22, 7.2-7.5, 7.9-7.14, 7.24-7.39] 15 hrs
- UNIT 4:** Correlation- Linear Regression- Rank correlation coefficient – simple problems. [Page no. 10.2-10.17, 10.23-10.29] 15 hrs
- UNIT 5:** Standard Distributions- Binomial, Poisson, Normal Distributions- Gamma and Beta Distributions- Simple problems.
[Page no 8.2-8.47, 9.3-9.27, 9.38-9.50] 15 hrs

RECOMMENDED TEXTBOOKS:

1. Fundamentals of Mathematical Statistics, S. C. Gupta and V.K. Kapoor.
2. Hogg, R.V. Craig, A.T. (1998) - Introduction to Mathematical Statistics, Macmillan.

BOOKS FOR REFERENCE:

1. Snedecor .G.W & Cochran W.G. (1967) Statistical Methods, Oxford and IBH.

2. Introduction to Mathematical statistic by Robert V Hogg.
3. Introduction to Mathematical statistical and learning with Applications in R by Gareth James and Daniela Witten.
4. Introduction to the Practice of Statistics by David S Moore and George P.
5. Introduction to the Probability and Mathematical Statistics by Lee J Bain and Max Engelhardt.

JOURNALS:

1. The application of characteristic scores and scale to the evaluation and ranking of scientific journals, Wolf gang Glanzel.
2. Application of distribution of citations among application in scientometric evaluations, P. Vinkler

E-LEARNING RESOURCES:

1. [https:// www.edi.org](https://www.edi.org) > learn
2. [https:// www.researchgate.net](https://www.researchgate.net)
3. [https:// study.com](https://study.com) > academic
4. [https:// www.ejmste.com](https://www.ejmste.com)
5. <https://www.texasgateway.org>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Discuss the concepts related to Probability theory and addition theorem
CO 2	Discuss conditional Probability and the related theorems
CO 3	Evaluate problems involving discrete and continuous random variable
CO 4	Investigate relationship between Correlation and Regression coefficients.
CO 5	Understand the concept of Binomial and Poisson distributions.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	3	2
CO 2	3	2	2	2	3
CO 3	2	3	3	2	2
CO 4	3	2	3	3	2
CO 5	2	2	2	2	3
AVERAGE	2.4	2.4	2.4	2.4	2.4

SEMESTER III MATHEMATICS- I

TOTAL HOURS: 75
CREDITS: 5

COURSE CODE: 172195
L-T-P: 4-1-0

COURSE OBJECTIVES:

1. Gain Knowledge about Binomial and Exponential Series
2. Develop skills for solving equations and finding solutions, finding inverse of matrix by Cayley Hamilton theorem
3. Study the basic concepts and tools for finding n -th derivative and the applications of Leibnitz theorem

COURSE OUTLINE:

- UNIT 1:** Algebra - Partial fractions, Binomial, Exponential Series (without proof) summation of series and approximation - problems.
(Vol.1 Chapter 1–Page no. 1-89) 15 hrs
- UNIT 2:** Theory of Equations- polynomial equations with real co-efficient, Imaginary, irrational roots, Transformation of an equation by diminishing or increasing its roots by a constant – problems, Reciprocal Equations.
(Vol.1 Chapter 3 – Page no. 120-174) 15 hrs
- UNIT 3:** Matrices- Symmetric, Skew-symmetric, Orthogonal and Unitary matrices, rank of a matrix, consistency of equations.
(Vol.1 Chapter 4 Page no. 192-208, 216-235) 15 hrs
- UNIT 4:** Characteristic roots, Cayley – Hamilton theorem (without proof) – problems.
(Vol.1 Chapter 4 – Page no. 237-266) 15 hrs
- UNIT 5:** Differential Calculus- n^{th} derivatives, Leibnitz theorem (without proof) and applications.
(Vol.2 Chapter 1 - Page no. 1-23) 15 hrs

RECOMMENDED TEXTBOOKS:

1. Allied Mathematics – Vol.1 & 2 by Prof. P. Duraipandian and Dr.S.Udayabaskaran, Muhil Publishers, Chennai.
2. Allied Mathematics - Vol.1 by P.Kandasamy and K.Thilagavathy, S.Chand& Company Ltd., New Delhi.

REFERENCE BOOKS:

- 1.Allied Mathematics-G.Venkatachalapathy Margham Publications.
- 2.Allied Mathematics-A.Abdul Rasheed Tata McGraw Hill Education.

JOURNALS:

- 1.Indian journal of pure and applied mathematics

www.springer.com/mathematics/journal/13226.

2. International journal of pure and applied mathematics
<https://ijpam.eu>

E-LEARNING RESOURCES:

1. [https:// www.elsevier.com](https://www.elsevier.com)

2. <https://www.springer.com>

3. www.dlsbmcollege.org

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Recognize and find summation of Binomial and Exponential series
CO 2	Finding roots or solution of an algebraic equations
CO 3	Solving system of linear equations using inverse of matrix
CO 4	Study about eigen values and eigen vectors, finding inverse of a matrix by cayley hamilton theorem
CO 5	Acquiring knowledge of n-th derivative and its applications

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	3
CO 2	3	3	3	2	2
CO 3	2	2	3	2	2
CO 4	2	3	2	2	3
CO 5	2	2	2	3	2
AVERAGE	2.2	2.4	2.4	2.2	2.4

SEMESTER IV REAL ANALYSIS - I

TOTAL HOURS: 75

CREDITS: 4

COURSE CODE: 172108

L-T-P: 4-1-0

COURSE OBJECTIVES:

- 1.To discuss the real numbers,least upper bounds, and the Countability.
- 2.Recognize Convergent, divergent, bounded, Cauchy and monotone sequences.
- 3.Determine convergence or divergence of geometric series.
4. To gain knowledge of Fourier series

COURSE OUTLINE:

- UNIT 1:** Functions - Functions, Real-value functions, Equivalence, Countability, Real numbers, Least upper bound Chapter-1-Section 1.3-1.7 [Page no.7-23] 15hrs
- UNIT 2:** Sequences -Sequences, Bounded sequences, Monotonic sequences, Convergent sequences, Divergent and Oscillating sequences, Algebra of Limits.Chapter-3-Section 3.1-3.6 [Page no. 39-67] 15hrs
- UNIT 3:** Sequences(Continued) - Behavior of Monotonic sequences, some theorems on limits(Statement s only),Subsequences, Limit point, Cauchy sequences.Chapter-3-Section 3.7-3.11[Page no. 68-103] 15hrs
- UNIT 4:** Series of Positive Terms -Infinite series, Comparison Test, D'Alembert's Ratio test, Raabe's Test, Cauchy's Root Test, Alternating series, Absolute convergence(Simple Problems). 15hrs
- UNIT 5:** Fourier Series Expansion of periodic functions of periods 2π , Expansion of even and odd functions, Half range series. 1.1-1.67 15hrs

RECOMMENDED TEXTBOOKS:

1. Methods of Real analysis by R.Goldberg, Oxford & IBM Publishing Co., 1970 (For Unit 1).
2. Sequences and Series by Dr.S.Arumugam and Mr.A. ThangapandiIsac, New Gamma Publising House, 1999 (For Unit 2,3& 4).
3. Fourier Series, Differential equations, Fourier and Laplace Transform by P.R.Vittal, Margam Publishers, (For Unit 5)

REFERENCE BOOKS:

1. Principles of Mathematical Analysis by Walter Rudin, McGraw Hill International Edition(III),1976
2. Mathematical Analysis by TOM.M. Apostol, Second Edition, Narosa Publishers.
3. Engineering Mathematics -1 by A.Singaravelu, Meenakshi Publishers.

4. R.Bartle and D.Sherbert introduction to real Analysis, John Wiley and sons, New York.
5. J.Mikusiuki and P.Mikusiuki An introduction to analysis, John Wiley and sons, New York, 1993.

JOURNALS:

1. A Study on new sequences of functions involving H – function
2. A new application of quasi power increasing sequences

E-LEARNING RESOURCES:

<https://link.springer.com>

<https://www.sciencedirect.com>

<https://www.researchgate.net>

<https://www.math.stonybrook.edu>

<https://carma.newcastle.edu.au>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Define and recognise the series of real numbers and convergence.
CO 2	Determine if an infinite sequence is bounded.
CO 3	Find the sum of a convergent geometric series
CO 4	Determine if an infinite series is convergent or divergent by selecting the appropriate test from the following (a) test for convergence, (b) integral Test (c), the comparison test (d) alternating series.
CO 5	Discuss Fourier Series Expansion of periodic functions of periods 2π , Half range series

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	2
CO 2	3	2	2	2	3
CO 3	2	3	2	3	2
CO 4	2	2	3	2	2
CO 5	2	3	2	2	3
AVERAGE	2.2	2.4	2.4	2.2	2.4

SEMESTER IV STATICS

TOTAL HOURS: 75

COURSE CODE: 172107

CREDITS: 4

L-T-P: 4-1-0

COURSE OBJECTIVES:

1. Develop an understanding of the Principles of Statics.
2. To apply the law of Statics.
3. To gain knowledge of Equilibrium conditions of static body.

COURSE OUTLINE:

- UNIT 1:** Basic concepts and principles- Forces- Types of forces, Magnitude and direction of the resultant of the forces acting on a particle, Lami's theorem. [Page no. 1-45] 15hrs
- UNIT 2:** Equilibrium of a particle under several coplanar forces acting on a particle, Parallel forces. [Page no. 47-59] 15hrs
- UNIT 3:** Moments and couples. [Page no. 61-96] 15hrs
- UNIT 4:** Friction- Laws of friction, angle of friction, equilibrium of a body on a rough inclined plane under any force. [Page no. 206-230] 15hrs
- UNIT 5:** Centre of gravity- Centre of gravity of Simple uniform bodies, triangular lamina, rods forming a triangle, trapezium. [Page no. 270-291] 15hrs

RECOMMENDED TEXTBOOKS:

Statics by M.K. Venkatraman, Agasthiar Publications.

Chapters : I, II, III, IV [Page no.1-97]

Chapter : VII -Sections 1 to 13 [Page no.206-230]

Chapter : VIII – Centre of gravity of uniform bodies mentioned in the syllabus

REFERENCE BOOKS:

1. Statics, S. Narayanan and others S. Chand and Co.
2. Statics, K.ViswanathaNaik and M.S. Kasi, Emerald Publishers.
3. Statics , S.G. Ventakatachalapathy- Margham Publishers.
4. The elements of Statics and Dynamics, Part-1, S.L. Loney
5. Statics and Dynamics- Eleventh edition, R.C. Hibbeler

E-LEARNING RESOURCES:

1. <http://cosmolearning.org>
2. <http://mechzonblog.files.wordpress.com>
3. <http://oil.cmu.edu>
4. <http://online.missouri.edu>
5. <http://researchgate.net>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand the type of forces, finding resultant of forces and Lami's theorem
CO 2	Analyze the equilibrium of a particle under several coplanar of forces
CO 3	Find moments and couples
CO 4	To find angle of friction
CO 5	Finding centre of gravity of uniform bodies, triangle and trapezium

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	3	2
CO 4	2	2	2	2	2
CO 5	3	2	2	2	2
AVERAGE	2.2	2.2	2.2	2.2	2.2

**SEMESTER IV
MATHEMATICAL STATISTICS– II**

**TOTAL HOURS: 75
CREDITS: 5**

**COURSE CODE: 172194
L-T-P: 4-1-0**

COURSE OBJECTIVES:

- 1.To learn the basics of sampling and to understand Tests of significance .
2. To derive some results on chi-square distribution and application of t distribution.
3. To acquire knowledge of test of hypothesis and Power of test of Neymann Pearson Lemma

COURSE OUTLINE:

- UNIT 1:** Large sampling theory- Types of sampling – Parameters and statistics -Test of Significance- Test of significance for large samples sampling of attributes- Simple problems. [Page no. 14.2 - 14.36] 15hrs
- UNIT 2:** Chi-square distribution- Some theorems on Chi square distribution – Simple Problems. [Page no. 15.2 – 15.31] 15hrs
- UNIT 3:** Theory of attributes- Tests of independence of attributes based on contingency Tables - Goodness of fit, Tests based on chi-square – Simple Problems. [Page no. 15.31 - 15.43] 15hrs
- UNIT 4:** Students t distribution – constant od t distribution – application of t distribution - Simple problems [Page no. 16.2 - 16.28] 15hrs
- UNIT 5:** Tests of hypothesis: Type I and II errors. Power of test- Neymann Pearson lemma- - Simple problems [Page no. 18.2 - 18.22] 15hrs

RECOMMENDED TEXTBOOKS:

- 1.Fundamentals of Mathematical Statistics, S. C. Gupta and V.K. Kapoor.
2. Hogg, R.V. Craig, A.T. (1998) - Introduction to Mathematical Statistics, Macmillan.

.BOOKS FOR REFERENCE:

1. Snedecor .G.W & Cochran W.G. (1967) Statistical Methods, Oxford and IBH.
2. Introduction to Mathematical statistic by Robert V Hogg.
3. Introduction to Mathematical statistical and learning with Applications in R by Gareth James and Damiela Written.
4. Introduction to the Prattice of Statistics by David S Moore and George P.
5. Introduction to the Probability and Mathematical Statistics by Lee J Bain and Max Engelhart.

JOURNALS:

- 1.International journal of Statistics and Applied Mathematics

E-LEARNING RESOURCES:

1. [https:// www.edi.org](https://www.edi.org) > learn
2. [https:// www.researchgate.net](https://www.researchgate.net)
3. [https:// study.com](https://study.com) >academic
4. [https:// www.ejmste.com](https://www.ejmste.com)
5. <https://www.texasgateway.org>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Gain Knowledge on basics of large sampling theory, parameters and statistics and test of significance
CO 2	Distinguish between chi-square distribution and student t distribution
CO 3	Develop clear idea regarding contingency tables and Goodness of fit test
CO 4	Discuss Student 't' distributions and its applications
CO 5	Analyze the concept of Type I and Type II error and discuss Neyman Pearson Lemma

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	2	3	2
CO 2	3	2	2	2	3
CO 3	2	3	3	2	2
CO 4	3	2	3	3	2
CO 5	2	2	2	2	3
AVERAGE	2.4	2.4	2.4	2.4	2.4

SEMESTER IV MATHEMATICS- II

TOTAL HOURS: 75
CREDITS: 5

COURSE CODE: 172196
L-T-P: 4-1-0

COURSE OBJECTIVES:

1. To provide knowledge of basic computational skills using integration

2. To calculate directional derivative, gradient and Curl of vectors and evaluate double and triple integral for finding area and volume.
3. To introduce Laplace Transform and Inverse Laplace Transform and study its applications

COURSE OUTLINE:

UNIT 1: Bernoulli's formula for integration by parts, properties of definite integral,

Reduction formula for $\sin^n x$, $\cos^n x$ and $\tan^n x$. (simple problems).

(Chapter 2 - Page no. 140-152,157,158,161). 15hrs

UNIT 2: Vector Differentiation: Scalar point functions, Vector point functions, gradient, divergence, curl, irrotational and solenoidal - problems.

(Chapter 7 - Page no.454-479). 15hrs

UNIT 3: Vector Integration: Line, Surface and Volume Integrals, Green's theorem, Gauss

Divergence theorem (over a Rectangular Parallelepiped and over a unit Sphere),

Stoke's theorem (over a Plane area and over unit sphere). (Simple problems only)

(Chapter 7 - Page no.481-532) 15hrs

UNIT 4: Laplace Transforms – Laplace Transformation of standard functions and properties

– Problems.(Chapter 7 - Page no.392-407) 15hrs

UNIT 5: Inverse Laplace transforms - Solving second order differential equations with

constant coefficients.(Chapter 7 - Page no.409-431) 15 hrs

RECOMMENDED TEXTBOOKS:

1. Allied Mathematics Volume II- Prof. P. Duraipandian and Dr.S. Udayabaskaran, Muhil Publishers, Chennai.
2. Allied Mathematics - vol.2 by P.Kandasamy and K.Thilagavathy, S.Chand & Company Ltd., New Delhi
3. Allied Mathematics – by P.R.Vital and Malini

REFERENCE BOOKS:

- 1.Allied Mathematics-G.Venkatachalapathy Margham Publications.
- 2.Allied Mathematics-A.Abdul Rasheed Tata McGraw Hill Education.

JOURNALS:

- 1.Indian journal of pure and applied mathematics
www.springer.com/mathematics/journal/13226.
- 2.International journal of pure and applied mathematics
<https://ijpam.eu>

E-LEARNING RESOURCES:

- 1 .[https:// www.elsevier.com](https://www.elsevier.com)
- 2.<https://www.springer.com>
- 3.www.dlsbmscollege.org

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Evaluate integrals by using partial fraction, integration by parts and reduction formulas
CO 2	Compute gradient, divergence, curl of a vector point function.
CO 3	Compute surface area and volume of given solids integrals using Divergence theorem, stokes theorem and Greens theorem
CO 4	Calculate Laplace transform of standard functions and apply properties of laplace transforms to solve problems
CO 5	Explain inverse laplace transform to solve linear differential equations

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	2
CO 2	3	2	3	2	2
CO 3	3	3	2	2	3
CO 4	2	2	2	3	2
CO 5	2	3	3	2	3
AVERAGE	2.4	2.4	2.4	2.2	2.4

SEMESTER V
MODERN ALGEBRA-I

TOTAL HOURS: 90
CREDITS: 4

COURSE CODE:142109
L-T-P:4-2-0

COURSE OBJECTIVES:

1. Assess properties implied by the definitions of groups and rings. Use various canonical types of groups (including cyclic groups and groups of permutations). Analyze and demonstrate examples of subgroups, normal subgroups and quotient groups
2. Analyze and demonstrate examples of ideals and quotient rings, Use the concepts of isomorphism and homomorphism for groups and rings
3. Analyze Integral Domain, Ideals, Principle Ideal ring, Euclidean Ring and Unique Factorization Domain

COURSE OUTLINE:

UNIT 1:	Normal subgroups, Quotient groups, Homomorphisms, Automorphism. [Page no. 49 – 70]	18hrs
UNIT 2:	Cayley's Theorem, Permutation Groups. [Page no. 71 – 80]	18hrs
UNIT 3:	Rings- Definition, Examples- Special classes of Rings; Homeomorphisms [Page no. 120 – 133]	18hrs
UNIT 4:	Ideals and Quotient Rings- More ideals and Quotient rings [Page no. 133 – 139]	18hrs
UNIT 5:	The field of quotients of an Integral Domain- Euclidean Rings. [Page no. 140 – 149]	18hrs

RECOMMENDED TEXTBOOKS:

1. Topics in Algebra by I.N. Herstein, Wiley Eastern Ltd
2. Modern Algebra by K. Viswanath Naik, Emerald Publishers

REFERENCE BOOKS:

1. Algebra – S. Arumugam, Scitech Publications
2. University Algebra, N.S. Gopalakrishnan, New age International Publishers
3. Basic abstract Algebra, P.B. Bhattacharya, S.K. Jain, S.R. Nagpur, Cambridge University

JOURNALS:

1. Abstract homeomorphisms of algebraic groups
2. Classification of canonical basis $n-2$ dimensional subspaces of n -dimensional vector space

E-LEARNING RESOURCES:

1. <https://pdfs.semanticscholar.org>
2. <https://ocw.mit.edu/mathematics-modern-algebra-press>
3. <https://extension.haward.edu-openlearning-initiative-abstract-algebra>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Gain knowledge of Normal subgroups, Quotient groups, Homomorphisms, Automorphism.
CO 2	Extend group structure to finite permutation group - Cayley's Theorem.
CO 3	Assess the Definitions, Examples and Theorems in Rings, Special classes of Rings; Homeomorphisms
CO 4	Analyze and develop a given structure in detail
CO 5	Able to discuss field extension

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	2
CO 2	3	2	2	2	2
CO 3	2	2	2	2	2
CO 4	2	2	2	2	2
CO 5	2	2	3	2	2
AVERAGE	2.2	2	2.2	2	2

SEMESTER I REAL ANALYSIS - II

TOTAL HOURS: 90
CREDITS: 4

COURSE CODE: 142110
L-T-P: 4-2-0

COURSE OBJECTIVES:

- 1.To study the concepts of limit of a function on the real line & limits in metric space.
- 2.To discuss the continuity of functions on metric spaces and their properties
- 3.To study the compactness and completeness of real functions.

COURSE OUTLINE:

- UNIT 1: Metric Spaces** -Limit of a function on the Real Line, Metric Spaces, Limits in Metric Spaces.
Sections :4.1, 4.2, 4.3 18hrs
- UNIT 2: Continuous Functions on Metric Spaces** -Functions continuous at a point on the Real line, Reformulation, Functions continuous on a Metric Space, Open Sets.
Sections :5.1, 5.2, 5.3, 5.4 18hrs
- UNIT 3:** Closed sets, Discontinuous functions on $\mathbb{R}$, More about open sets, Connected sets.
Sections :5.5, 5.6, 6.1, 6.2 18hrs
- UNIT 4:** Bounded sets and totally bounded sets, Complete metric spaces, Compact metric spaces
Sections :6.3, 6.4, 6.5 18hrs
- UNIT 5:** Continuous functions on compact Metric spaces, Continuity of the Inverse function, Uniform Continuity
Sections :6.6, 6.7, 6.8 18hrs

RECOMMENDED TEXTBOOKS:

1. Methods of Real analysis by Richard Goldberg, Oxford & IBM Publishing Co.,1970

REFERENCE BOOKS:

- 1 Principles of Mathematical Analysis by Walter Rudin, McGraw Hill International Edition(III),1976
- 2 Mathematical Analysis by TOM.M. Apostol, Second Edition, Narosa Publishers.
- 3 Engineering Mathematics -1 by A.Singaravelu, Meenakshi Publishers.
- 4 R.Bartle and D.Sherbert introduction to real Analysis,JohnWiely and sons,Newyork.
- 5 J.Mikusiuki and P.Mikusiuki An introduction to analysis,JohnWiely and sons, Newyork, 1993.

JOURNALS:

- 1.Necessary conditions for a fixed point of maps in non metric spaces
- 2.Completeness and compact generations in partially ordered sets

E-LEARNING RESOURCES:

<https://link.springer.com>

<https://www.sciencedirect.com>

<https://www.researchgate.net>

<https://www.math.stonybrook.edu>

<https://carma.newcastle.edu.au>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Will be able to understand the basics of real analysis
CO 2	Can recognize the real functions and its limits
CO 3	Will be able to construct proofs of basic mathematical results in real Analysis
CO 4	Appreciate how abstract ideas and rigorous methods in mathematical Analysis can be applied to important practical problems.
CO 5	Describe continuous functions on compact metric space.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	2
CO 2	2	3	3	2	3
CO 3	3	2	2	2	2
CO 4	2	2	2	2	3
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2	2.4

SEMESTER I

PROGRAMMING LANGUAGE 'C' THEORY

TOTAL HOURS: 90

CREDITS: 4

COURSE CODE: 142111

L-T-P: 4-2-0

COURSE OBJECTIVES:

1. To develop programming skills using the fundamentals and basic of C language
2. To study the advantages of user defined data types that provides flexibility for application development
3. To enable effective usage of arrays, structures, functions and pointers

COURSE OUTLINE:

- UNIT 1:** Introduction – C Tokens – Keywords and Identifiers – Constants – Variables – Data types – Declaration of Variables – Declaration of Storage class – Operators – Introduction – Arithmetic Operators – Increment and Decrement Operators – Conditional Operator – Bitwise Operators – Special Operators – Precedence of Arithmetic Operators.
[Page no. 22-37,52-64] 18hrs
- UNIT 2:** Input and Output Operations – Introduction – Reading a Character – Writing a Character – Formatted Input – Formatted Output – Control Statements – Simple if Statement – The if-else Statement – Nesting of if-else statements – The Else if Ladder – The Switch Statement – The Goto Statement – The while Statement – The do Statement – The for Statement.
[Page no. 83-96,112-143,151-158] 18hrs
- UNIT 3:** Arrays – Introduction – One-Dimensional Arrays – Declaration of One-Dimensional Arrays – Initialization of One-Dimensional Arrays – Two-Dimensional Arrays – Initialization Two-Dimensional Arrays – Multi-Dimensional Arrays – Strings – Introduction – Declaring and Initializing String Variables – Arithmetic Operators on Characters – String-Handling functions.
[Page no. 192-215,237-238,249,253] 18hrs
- UNIT 4:** Introduction – Definition of Functions – Function Calls – Function Declaration – Category of functions – Nesting of functions – Recursion – Passing Strings to Functions – Passing String to Functions – Structures – Introduction – Defining a Structure – Declaring Structure Variables – Structure Initialization – Unions.
[Page no. 274-273,278-281,294-301,324-330,343] 18hrs
- UNIT 5:** Pointers – Introduction – Declaring Pointer Variables – Initialization of Pointer Variables – Accessing a Variable through its Pointer – File – Introduction – Defining and Opening a File – Closing a File – Input/Output Operations on files – Command Line Arguments.
[Page no. 357,361-363,395-398,414]. 18hrs

RECOMMENDED TEXTBOOKS:

1. Programming in “ANSI C” E. Balaguruswamy, Second edition, Tata McGraw Hill publishers

REFERENCE BOOKS:

1. Programming Language C with Practicals, Ananthi Sheshasaayee & G. Sheshasaayee, Margham Publications
2. Programming with C by Brian W. Kernighan and Dennis M. Ritchie
3. The C programming Language by Brian W. Kernighan, Dennis M. Ritchie

4.Programming in C & C++ Dr.S.S.KhandareS.Chand

5.C in depth S.K.SrivastavaDeepaliSrivastava

JOURNALS:

1.A serious game for learning C programming – online – Journals.org

2. Science of computer programming – journal – Elsevier

E-LEARNING RESOURCES:

1. <https://www.guru99.com>
2. <https://www.trytoprogram.com>
3. <https://www.programiz.com>
4. <https://www.tutorialspoint.com>
5. <https://www.slideshare.net>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Read, understand and trace the execution of programs written in C language. Study the concept of C character set, identifiers, keywords, variable names and different data types & sizes
CO 2	Gain knowledge about types of operators standard and formatted I/O and choose the loops and decision making statements to solve the problem
CO 3	Implement different operations on Arrays
CO 4	Use functions to solve the given problem
CO 5	Understand Pointers, Structures and Unions

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2.2	2.2

SEMESTER V DYNAMICS

TOTAL HOURS: 90

CREDITS: 4

COURSE CODE: 142112

L-T-P: 4-2-0

COURSE OBJECTIVES:

- 1.To learn the concepts of generalized force and principle of virtual work.
2. To equip the student with fundamental knowledge of dynamics.
3. To discuss the Moment of Inertia, Perpendicular axes and Parallel axes theorem.

COURSE OUTLINE:

- UNIT 1:** Kinematics – Velocity, Resultant of velocities, Relative velocity, acceleration, Velocity and acceleration in a rectilinear motion, Coplanar motion. Angular velocity, Relative angular velocity, Rectilinear motion when the acceleration is constant, Newton's laws of motion, Vertical motion under gravity; motion along a smooth inclined plane; work power and Energy– definition and simple problems only – Principle of work -Energy(statement only),Principle of conservation of energy (statement only).
[Page no. 1-40,209-215,224-234] 18hrs
- UNIT 2:** Simple harmonic motion- Amplitude, period, epoch, phase- composition of two simple harmonic motions - simple problems.
[Pageno.235-245] 18hrs
- UNIT 3:** Projectile- Time of flight, Greatest height, Horizontal range; Enveloping parabola - simple problems - Range on an inclined plane.
[Pageno.260-284] 18hrs
- UNIT 4:** Central orbits, Central force, The differential equation of a central orbit in polar coordinates and in p-r coordinates; law of force and speed for a given force; velocity from infinity; Inverse square law; simple problems.
[Page no. 332-352] 18hrs
- UNIT 5:** Moment of Inertia; Theorem of perpendicular axes and parallel axes; moment of inertia of uniform bodies; thin rod, rectangular lamina, circular ring, circular disc, elliptic lamina, solid sphere, hollow sphere, solid cone and Hollow cone.
[Pageno.353-365] 18hrs

RECOMMENDED TEXTBOOKS:

Mechanics by P. Duraipandian, LaxmiDuraipandian, D. Muthamizh, Sixth Edition, Reprint 2010

BOOKS FOR REFERENCE:

- 1.Dynamics: M.K. Venkatraman, Agasthiar Publications
- 2.Dynamics , Dr. M. D. Raisinghania.
- 3.Rigid Body Dynamics of Mechanisms Theoretical Basis by Hubert Hahn.
- 4.Kinematics and Dynamics of Mechanics by GH Martin.
- 5.Marcelo. R. M. Crespo Da Silva, Fundamentals of Dynamics and Analysis of Motion.

JOURNALS:

E-LEARNING RESOURCES:

1. [https:// www.elsevier.com](https://www.elsevier.com)
2. [https://www. springer.com](https://www.springer.com)
3. [https:// link . springer.com](https://link.springer.com)

4. [https:// www.mdpi.com](https://www.mdpi.com)>jou

5. <https://www.tandfonline.com>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Analyze Statics and Dynamics force analysis of mechanisms.
CO 2	Gain knowledge regarding projectile.
CO 3	Study the concepts of Simple Harmonic motion.
CO 4	Be familiar with Central orbit.
CO 5	Apply Kepler's laws to solve the problems.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	2
CO 2	2	3	3	2	3
CO 3	3	2	2	2	2
CO 4	2	2	2	2	3
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2	2.4

SEMESTER V

OPERATIONS RESEARCH-I

TOTAL HOURS: 75
CREDITS: 5

COURSE CODE: 142113
L-T-P: 4-1-0

COURSE OBJECTIVES:

- 1.To impart knowledge in concepts and tools of Operations Research
- 2.To understand mathematical models used in Operations Research
- 3.To apply these techniques constructively to make effective business decisions.

COURSE OUTLINE:

- UNIT 1:** Linear programming problem – Mathematical formulation of the problem – Graphical solution method – Some exceptional cases – General linear programming problem – canonical and standard forms of LPP – Insights into the simplex method.
[Chap 2.1-2.7 , Page no. 53-83] 15hrs
- UNIT 2:** The simplex method – Introduction – fundamental properties of solutions – The computational procedure – Exceptional cases – Artificial variable Techniques – Inverse of a matrix using simplex method – Problem of degeneracy – Applications of simplex method.
[Chap 3.1-3.8 , Page no. 86-148] 15hrs
- UNIT 3:** Games and Strategies – Introduction – Two-Person zero-sum games without saddle points – mixed strategies – Graphical solution of $2 \times n$ and $m \times 2$ games –Dominance property – Reducing the games problem to an LPP.
[Chap 9.1-9.7 ,Page no. 329-357] 15hrs
- UNIT 4:** The Transportation problem – Introduction – Matrix form of Transportation problem – The Transportation Table – Loops in Transportation Table and their properties – The Initial basic feasible solution Algorithm – Degeneracy in Transportation problems – Unbalanced Transportation problem.
[Chap 6.1-6.9 , Page no. 206-262] 15hrs
- UNIT 5:** The Assignment and Routing problem – The Assignment problem – The Assignment Algorithm- Unbalanced Assignment problem - Routing Problems.
[Chap 7.1-7.4 , Page no. 266-293] 15hrs

RECOMMENDED TEXTBOOKS:

1. Operations Research by KantiSwarup, P. K.Gupta and Man Mohan, Sultan Chand & Sons, Educational Publications (sixth revised Edition)
2. Prof: V.Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan, A.R. publications, Revised Edition, june 2009.

REFERENCE BOOKS:

1. Gauss. S.I Linear Programming- Mcgraw- Hill publications
2. Gupta P.K. &Hira D.S.- Problems in operations Research, S.Chand& Co.,
3. Operations Research by S.K Jain and D.M.Mehta,Galgotia ,Second edition
4. Operations Research –Theory and Applications by J.K .Sharma,2009,4thedition.Mcmillan
5. Kasana,HS and Kumar, Kd, Introductory Operations Research Theory and Applications,2008,Springer.

JOURNALS:

- 1.Application of Linear Programming for Optimal use of Raw Materials in Bakery,Akpan,N.P and Iwok.I.A
- 2.R.D.Snyder Linear Programming with special ordered sets, Journal of the Operational Research Society,35(1984).

E-LEARNING RESOURCES:

- 1.<http://www.statistics.com> >optimiza..
- 2.<http://www.researchgate.net>.
- 3.<http://www.informs.org> > Game Theory.
- 4.<http://www.wisdomjob.com> >unb
- 5.<http://www.hindawi.com> > aor.

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Formulate LPP models and discuss various solution Techniques
CO 2	Identify basic feasible solution and Optimal solution using Simplex Method and propose best strategy.
CO 3	Understand the various methods of solving Game Theory Problems
CO 4	Explain the Transportation Problem and formulate in LPP
CO 5	Acquire the knowledge of Assignment Problem.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	2
CO 2	2	3	3	2	3
CO 3	3	2	2	2	2
CO 4	2	2	2	2	3
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2	2.4

SEMESTER VI MODERN ALGEBRA-II

TOTAL HOURS: 90
CREDITS: 5

COURSE CODE: 142114
L-T-P: 4-2-0

COURSE OBJECTIVES:

1. Study the concepts of the term Span, linear independence, basis, and dimension and apply these concepts to various vector spaces and subspaces
2. Compute inner products and determine orthogonality on vector spaces, including Gram-Schmidt orthogonalization
3. Use matrix algebra and the related matrices to linear transformation

COURSE OUTLINE:

UNIT 1:	Vector Spaces; Definition and examples, Linear Dependence and Independence and Bases. [Page no. 172-182]	18hrs
UNIT 2:	Dual spaces, Inner Product spaces[Page no. 184-199]	18hrs
UNIT 3:	Linear Transformations, Algebra of Linear Transformations [Page no. 260-267]	18hrs
UNIT 4:	Characteristic roots, Matrices [Page no. 270-281]	18hrs
UNIT 5:	Canonical Forms- Triangular Forms [Page no. 285-290]	18hrs

RECOMMENDED TEXTBOOKS:

1. Topics in Algebra by I.N. Herstein, Wiley Eastern Ltd
2. Modern Algebra by K. ViswanathNaik, Emerald Publishers

REFERENCE BOOKS:

1. Algebra – S. Arumugam, Scitech Publications
2. University Algebra, N.S. Gopalakrishnan, New age International Publishers
3. Basic abstract Algebra, P.B. Bhattacharya, S.K .Jain , S.R.Nagpul, Cambridge University

JOURNALS:

1. Abstract homeomorphisms of algebraic groups
2. Classification of canonical basis $n-2$ dimensional subspaces of n -dimensional vector space

E-LEARNING RESOURCES:

- 1.<https://www.scilab.org>.
- 2.<https://wxmaxima.sourceforge.net>

3.<https://www.geogebra.org>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Analyze finite and infinite dimensional vector spaces and subspaces over a field and their properties, including the basis structure of vector spaces
CO 2	Use the definition and properties of linear transformations and matrices of linear transformations and change of basis
CO 3	Compute inner products and determine orthogonality on vector spaces, including Gram-Schmidt orthogonalization
CO 4	Compute with the characteristic polynomial, eigenvectors, eigenvalues and eigenspaces, as well as the geometric and the algebraic multiplicities of an eigenvalue and apply the basic diagonalization result
CO 5	Identify self-adjoint transformations and orthogonal decomposition of inner product spaces, the Jordan canonical form to solving systems of ordinary differential equations

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	2
CO 2	2	3	3	2	3
CO 3	3	2	2	2	2
CO 4	2	2	2	2	3
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2	2.4

SEMESTER VI COMPLEX ANALYSIS

TOTAL HOURS: 90
CREDITS: 5

COURSE CODE: 142115
L-T-P: 4-2-0

COURSE OBJECTIVES:

- 1.To define and analyze limits and continuity for complex functions
- 2.To express complex numbers in polar form
3. To evaluate the complex contour integrals directly and by using Cauchy integral formula.

COURSE OUTLINE:

- UNIT 1:** Analytic functions- Analytic functions, conjugate functions, Harmonic functions, Necessary and sufficient conditions for $f(z)$ to be analytic, polar form of Cauchy Riemann equations, construction of analytic function, simple problems.
[Page no. 29-76] 18hrs
- UNIT 2:** Conformal Representation- Jacobian of transformations, conformal transformations, some general transformations, Bilinear transformations, critical points, fixed points, cross ratio- simple problems.
[Page no. 100-158] 18hrs
- UNIT 3:** Complex Integration- Elementary definitions, complex line integral, Cauchy's theorem (without proof) Extension of Cauchy's theorem, Cauchy's integral formula and its generalized form, Poisson's Integral formula, Morera's theorem, Cauchy's Inequality, Liouville's theorem, Taylor's theorem, Laurent's theorem and its Uniqueness- Simple Problems.
[Page no. 197-282] 18hrs
- UNIT 4:** Singularities - Zero of a function, Singular point, different types of Singularities, Poles and Zeros.
[Page no. 283-311] 18hrs
- UNIT 5:** The Calculus of Residues: Residue at a pole, Cauchy's residue theorem- Simple problems. [Page no. 312-446] 18hrs

RECOMMENDED TEXTBOOKS:

Functions of a complex variable - Dr. J.K. goyal&K.P.Gupta, Pragathi - Prakashan Publishers, 24th Edition 2013.

BOOKS FOR REFERENCE:

- 1.Complex Analysis- T.K. ManicavachagamPillai, Dr.S.P. Rajagopalan& Dr. R. Sattanathan, S.Viswananthan Printers& Publishers Pvt. Ltd.
- 2.Real and complex analysis, Walter Rudin, Tata McGraw hill Publishing company limited, New Delhi
- 3.Functions of complex variables, J.N.Sharma, Krishnaprakasham Media, 1991

JOURNALS:

- 1.International journal of complex systems [www.ij-complex](http://www.ij-complex.org) sys.org
- 2.Journal of complex analysis <https://www.publons.com>

E-LEARNING RESOURCES:

1. [https:// www.elsevier.com](https://www.elsevier.com)
2. [https://www. springer.com](https://www.springer.com)
3. [https:// link . springer.com](https://link.springer.com)
4. [https:// www.mdpi.com](https://www.mdpi.com)>jou
5. <https://www.tandfonline.com>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Will be able to define the concepts of derivation of analytic functions.
CO 2	Can calculate the analytic functions and perform mathematical operations on complex numbers
CO 3	Evaluate complex integrals by using Cauchy integral theorem.
CO 4	Will be able to express function as infinite series using Taylor's Theorem, Morera's theorem etc.
CO 5	Classify Singularities and calculate complex integrals using Residue theorem.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	2
CO 2	2	3	3	2	3
CO 3	3	2	2	2	2
CO 4	2	2	2	2	3
CO 5	2	3	2	2	2
AVERAGE	2.2	2.4	2.2	2	2.4

SEMESTER VI
PROGRAMMING LANGUAGE 'C' PRACTICAL

TOTAL HOURS: 90
CREDITS: 4

COURSE CODE: 142116
L-T-P: 2-0-4

COURSE OBJECTIVES:

1. To develop programming skills using the fundamentals and basics of C language
2. To study the advantages of user defined data types that provides flexibility for application development
3. To enable effective usage of arrays, structures, functions and pointers

COURSE OUTLINE:

Writing 'C' Programs for the following:

1. To convert centigrade to Fahrenheit
2. To find the area, circumference of a circle
3. To convert days to months and days
4. To solve quadratic equations
5. To find sum of n numbers
6. To find the largest and smallest number
7. To evaluate the sine series, cosine series
8. To evaluate the power series
9. To generate Pascal's triangle, Floyd's triangle
10. To add and subtract two matrices
11. To multiply two matrices
12. To evaluate Fibonacci series using functions
13. To evaluate Compound Interest using functions
14. To add complex numbers using functions
15. To use string functions

RECOMMENDED TEXTBOOKS:

Programming in "ANSI C" E. Balaguruswamy, Second edition, Tata McGraw Hill publishers

REFERENCE BOOKS:

1. Programming Language C with Practicals, AnanthiSheshasaayee&G.Sheshasaayee, Margham Publications
2. Programming with C by Brian W.Kernighan and Dennis Ritchie
3. The C programming Language by Brian W.Kernighan, Dennis M.Ritchie
4. Programming in C & C++ Dr.S.S.KhandareS.Chand
5. C in depth S.K.SrivastavaDeepaliSrivastava

JOURNALS:

1. A serious game for learning C programming – online – Journals.org
2. Science of computer programming – journal – Elsevier

E-LEARNING RESOURCES:

1. <https://www.guru99.com>
2. <https://www.trytoprogram.com>
3. <https://www.programiz.com>
4. <https://www.tutorialspoint.com>
5. <https://www.slideshare.net>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Read, understand and trace the execution of programs written in C language. Study the concept of C character set, identifiers, keywords, variable names and different data types & sizes
CO 2	Gain knowledge about types of operators standard and formatted I/O and choose the loops and decision making statements to solve the problem
CO 3	Implement different operations on Arrays
CO 4	Use functions to solve the given problem
CO 5	Understand Pointers, Structures and Unions

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	3	2	3
CO 2	2	2	2	2	2
CO 3	2	3	2	2	2
CO 4	3	2	2	3	2
CO 5	2	2	2	2	2
AVERAGE	2.2	2.2	2.2	2.2	2.2

SEMESTER VI

GRAPH THEORY

TOTAL HOURS: 90
142117

CREDITS: 5

COURSE CODE:

L-T-P:4-2-0

COURSE OBJECTIVES:

- 1.To understand and apply the fundamental concepts in graph theory.
2. To discuss the concepts of graph ,tree, Euler graph .
- 3.To apply Graph theory tools in solving practical problems.
- 4.To know how graph serves as models for many standard problems.

COURSE OUTLINE:

- UNIT 1:** Introduction, Graphs & Sub graphs; Definition and examples. Degrees, sub graphs, isomorphism, Ramsey numbers, independent sets and coverings. Intersection graphs and line graphs, Matrices, (Operations on graphs) [Page no. 5-28] 18hrs
- UNIT 2:** Degree sequences, Graphic sequences-Simple problems. Connectedness: Walks, Trails and Paths, Connectedness and components. Blocks, Connectivity. [Page no. 29-47] 18hrs
- UNIT 3:** Eulerian and Hamiltonian Graphs, Simple problems. [Page no. 48-60] 18hrs
- UNIT 4:** Trees- Introduction, characterization of trees, centre of a tree, Matchings introduction, matching, matchings in bipartite graphs. [Page no.61-72] 18hrs
- UNIT 5:** An introduction to algorithms- algorithmic complexity, search algorithms, sorting algorithms, introducing NP completeness, greedy algorithms, representing graphs in a computer. [Page no. 38-57] 18hrs

RECOMMENDED TEXTBOOKS:

1. “Invitation to graph theory” – S. Arumugam& S. Ramachandran, Scitech Publications, 9th Reprint, 2007.
2. “Applied and algorithmic graph theory”- GasyChartrand.

REFERENCE BOOKS:

- 1.Graph Theory and its applications, Bondy J.A.and Murty U.S.R, Macmillan publishers,NewYork.
2. A first look at Graph theory by John Clark- Allied Publihser.
3. Graph Theory by S. Kumaravelu and SusheelaKumaravelu.

4. A First Course in Graph theory by S.A. Choudum- Macmilan India Ltd.,
5. Introduction to Graph Theory by Robin J. Wilson Pearson Education Asia.

JOURNALS:

1. Graceful labeling of triangular extension of complete bipartite graph, sarbarimitra, soumyaBhowmik.
2. The cycle(circuit) polynomial of a graph of a graph with double and triple weights of edges and cycles , Vladimir R. rosenfeld.

E-LEARNING RESOURCES:

<https://www.neliti.com>

<https://www.ssrn.com>

<https://www.combinatorics.org>

<https://www.worldcat.org>

<https://www.stat.berrelay.edu>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Students will be able to discuss the basic concepts of graph theory.
CO 2	Apply the basic concepts of mathematical logic
CO 3	Draw Eulerian and Hamiltonian Graphs
CO 4	Will be able to describe and solve some real time problems using concepts of graph theory.
CO 5	Understand search algorithms, greedy algorithms

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	3	2	2
CO 2	3	2	2	2	2
CO 3	3	2	2	2	2
CO 4	2	2	3	3	2
CO 5	2	2	2	2	2
AVERAGE	2.4	2.2	2.4	2.2	2

SEMESTER VI OPERATIONS RESEARCH-II

TOTAL HOURS: 75
CREDITS: 5

COURSE CODE: 142118
L-T-P: 4-1-0

COURSE OBJECTIVES:

- 1.To introduce students to use Quantative methods and Techniques for effective decision making.
2. To gain knowledge of Queuing and Inventory models
3. To solve Problems using Analytic techniques.

COURSE OUTLINE:

- UNIT 1:** Revised Simplex method – Introduction – Revised simplex method – Standard form for revised simplex method – Revised simplex method versus simplex method – Bounded variables.
Chap 5.1-5.5 [Page no.187-205] 15hrs
- UNIT 2:** Network scheduling by PERT/CPM – Introduction – Basic concepts Constraints in network – Construction of the Networks – Time calculations in Networks critical Path Method (CPM) – PERT – PERT Calculations.
Chap 19.1-19.8 [Page no.711-724] 15hrs
- UNIT 3:** Inventory control – Economic lot size problems – Problem of EOQ with shortage – Multi-item Determining problem – Inventory control Techniques – uncertain Demand, Inventory control – Techniques – Stochastic problems – A typical Inventory problem – Inventory control with price breaks – Dynamic Programming and Inventory control – Queueing Theory and Inventory control.
Chap 17.6-17.14 [Page no.615-668] 15hrs
- UNIT 4:** Queueing Theory – Introduction – Queueing System – Characteristics of Queueing system – Symbols and notations – Poisson Process and Exponential Distribution – Classification of Queues – Definition of Transient and Steady States – Poisson Queues – Non-Poisson Queueing Systems.
Chap 16.1-16.9[Page no.532-591] 15hrs
- UNIT 5:** Sequencing problem – Introduction – Problem of Sequencing – Problems with n Jobs and two Machines –Problems with n Jobs and three Machines – Problems with n Jobs and m Machines – Graphical Solution.
Chap 10.1-10.6 [Page no.369-387] 15hrs

RECOMMENDED TEXTBOOKS:

1. Operations Research by KantiSwarup, P. K.Gupta and Man Mohan, Sultan Chand & Sons, Educational Publications (sixth revised Edition)
2. Prof: V.Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan, A.R. publications, Revised Edition, june 2009.

REFERENCE BOOKS:

1. Gauss. S.I Linear Programming- Mcgraw- Hill publications
2. Gupta P.K. &Hira D.S.- Problems in operations Research, S.Chand& Co.,
3. Operations Research by S.K Jain and D.M.Mehta,Galgotia ,Second edition
4. Operations Research –Theory and Applications by J.K .Sharma,2009,4thedition.Mcmillan

5. Kasana, HS and Kumar, Kd, Introductory Operations Research Theory and Applications, 2008, Springer.

JOURNALS:

1. G/M/I type queueing-inventory systems with postponed work, reservation, cancellation and common life time. A. Krishnamoorthy, Dhanya Shajin, B. Lakshmy.
2. Multivariate Design for Mass Customization of consumer products, Ningshi', Donsheng Xu', Ravindra S. Goonetilleke, Ke Fu and Haiquig Song.

E-LEARNING RESOURCES:

1. <http://www.researchgate.net>.
2. ecoursesonline.iasri.res.in.
3. <http://pdfs.semanticscholar.org>
4. <http://Alison.com>
5. <http://www.hindawi.com> >aor

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Will be able to identify a feasible solution and Optimal solution using Revised Simplex method
CO 2	Can solve problems using algorithms and also find EOQ Problems with Price breaks
CO 3	Use CPM and PERT techniques to plan, schedule and control project activities.
CO 4	Solve Queueing models using Kendal Notations
CO 5	Will have knowledge of Sequencing Problems and provide solutions in practical situations

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	3	3	2	2
CO 2	3	2	2	2	2
CO 3	3	2	2	2	2
CO 4	2	2	3	3	2
CO 5	2	2	2	2	2
AVERAGE	2.4	2.2	2.4	2.2	2

QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMEN

(AUTONOMOUS)

CHENNAI- 600 002.

DEPARTMENT OF PHYSICS

SYLLABUS



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

FOR CANDIDATES ADMITTED FROM 2017-2018

CONTENTS

1. Rules and regulations for the Programme
2. Programme specific outcomes

3. Programme profile
4. Evaluation pattern of CA
5. Rubrics for CA Evaluation
6. Evaluation pattern for end semester
7. Course profile – semester I
8. Course profile – semester II
9. Course profile – semester III
10. Course profile – semester IV
11. Course profile – semester V
12. Course profile – semester VI

PROGRAMME SPECIFIC OUTCOME

The primary aim of the programme is to understand nature and through meticulous observation of objects subjected to a variety of forces (matter, energy and their interactions).

1. The programme is aimed at developing the student to hone a depth of understanding the subject and help them to think logically.
2. It ignites them to design circuits and thereby appreciate the working of various instruments.
3. It inspires them to analyse the various concepts and improve their problem solving capability.
4. To integrate the knowledge gained in various topic and apply.
5. To give hands on experience in writing and executing programmes in high level and assembly language and to apply their theoretical knowledge in the field of research, medical and industry.

PROGRAMME PROFILE

From 2017-2018

Credits and Marks Consolidation – B.Sc.,

Subject Component	No. of Papers	Total Marks	Total Credits
Part I - Language	4	400	12
Part II – English	4	400	12
Total	8	800	24
Part III			
Core	15	1500	64
Elective	3	300	15
Allied	5	500	20
Total	23	2300	99
Part IV			
NME	2	200	4
Soft Skills	4	400	8
EVS	1	100	2
Value Education	1	100	2

Total	8	800	16
Part V			
Extension Activities			1
Grand Total	39	3900	140

FRAME WORK

Distribution of Hours, Marks and Credits for B.Sc., Physics Course

Semester	Component	Title of Paper	Subject Code	Hrs/ Wk	Total Hours	Credits	CA	SE	Total
I	Language	Paper I – Tamil	173301	4	60	3	25	75	100
	English	Paper I	173801	4	60	3	25	75	100

	Core	Paper I – Properties of Matter and Sound	172201	5	75	4	25	75	100
		Paper II – Thermal Physics and Thermodynamics	172202	5	75	4	25	75	100
		Practical I (No Exam)		2	30	-	-	-	-
	Allied	Paper I – Chemistry I	172391	3+ 3(P)	90	5	25	75	100
	NME I	(Optional)		2	30	2	40	60	100
	Soft Skill I	Paper I – Essentials of Language and Communication	179001	2	30	3	40	60	100
I Semester Total						24			700
II	Language	Paper II – Tamil	173302	4	60	3	25	75	100
	English	Paper II	173802	4	60	3	25	75	100
	Core	Paper III – C Programming	172203	6	90	4	25	75	100
		Paper IV - Practical I	172204	6	90	4	25	75	100
	Allied	Paper II – Chemistry II	172392	3	45	3	25	75	100
		Paper III – Chemistry Practical	172393	3	45	2	25	75	100
	NME II	(Optional)		2	30	2	40	60	100

	Soft Skill II	Paper II – Essentials of Spoken and Presentation Skills	179002	2	30	3	40	60	100
II Semester Total						24			800
III	Language	Paper III – Tamil	173303	6	90	3	25	75	100
	English	Paper III	173803	6	90	3	25	75	100
	Core	Paper V – Optics and Spectroscopy	172205	4	60	4	25	75	100
		Paper VI – Electricity and Magnetism	172206	4	60	4	25	75	100
		Practical II (No Exam)		2	30	-	-	-	-
	Allied	Paper I – Mathematics I	172195	5	75	5	25	75	100
	Soft Skill III	Paper III – Personality Enrichment	179003	2	30	3	40	60	100
	EVS	Environmental Studies (No Exam)		1	15	-	-	-	-
III Semester Total						22			600
IV	Language	Paper IV – Tamil	173304	6	90	3	25	75	100

	English	Paper IV	173804	6	90	3	25	75	100
	Core	Paper VII – Electromagnetism	172207	5	75	4	25	75	100
		Paper VIII - Practical II	172208	4	60	4	25	75	100
	Allied	Paper II – Mathematics II	172196	5	75	5	25	75	100
	Soft Skill IV	Paper IV – Basic Computer Skills and Applications	179004	2	30	3	40	60	100
	EVS	Environmental Studies	174001	2	30	2	40	60	100
	EXT	Extension Activities		-		1	-	-	-
IV Semester Total							25		700
V	Core	Paper IX – Atomic Physics	172209	4	60	4	25	75	100
		Paper X – Mechanics, Mathematical Physics and Relativity	172210	4	60	4	25	75	100
		Paper XI – Electronics and Communication	172211	4	60	4	25	75	100

		Paper XII – Nuclear Physics	172212	4	60	4	25	75	100
		Practical III (No Exam)		6	90	-	-	-	-
		Practical IV (No Exam)		2	30	-	-	-	-
	Elective I	Paper XIII – Laser Physics and Fiber Optics	172213	5	75	5	25	75	100
	VE	Value Education		1	15	-	-	-	-
V Semester Total						21			500
VI	Core	Paper XIV – Classical, Quantum and Statistical Mechanics	172214	6	90	4	25	75	100
		Paper XV – Solid State Physics	172215	6	90	4	25	75	100
		Paper XVI – Practical III	172216	6	90	4	25	75	100
	Elective II	Paper XVII – Integrated Electronics and Microprocessor	172217	5	75	5	25	75	100
	Elective III	Paper XVIII –	172218	6	90	5	25	75	100

		Practical IV							
	VE	Value Education	174003	1	15	2	40	60	100
VI Semester Total						24			600
Grand Total						140			390

Semester	Component	Title of Paper	Subject Code	Hrs	Total Hours	Credits	CA	SE	Total
I & II	Allied Physics	Paper I – Theory	172291	3 + 3(P)	90	5	25	75	100
		Paper II - Theory	172292	3	45	3	25	75	100
		Practical	172293	3	45	2	25	75	100
Total						10			300

Distribution of Marks for Continuous Assessment

Part I, Part II & Part III – Theory

Test		Total	Assignment / Seminar / Creative Presentation		Assignment on Glossary	Model Exam	Attendance	Total	Reduced to
1	2		1	2	3				
20	20	40	10	10	5	25	10	100	25

Attendance Marks:

90% - 100% : 10 Marks

80% - 89% : 9 Marks

75% - 79% : 8 Marks

65% - 74% : 7 Marks

50% - 64% : 5 Marks

Below 50% : 0 Marks (Not Eligible)

Distribution of Marks – Practical

Submission of observation : 50 Marks

Practical Model Exams : 50 Marks (25 + 25)

Total : 100 Marks

Reduced to : 25 Marks

Part IV

Seminar / Assignment	Test	Total
20	20	40

PATTERN OF QUESTION PAPER

CORE PAPER AND ALLIED

(THEORY)

SECTION

MAX MARKS: 75

PART - A

Short Answers (K1) (10 out of 12) (10 x 2 = 20)

PART - B

Paragraph Answers(K2) (5 out of 8) (5x 5 = 25)

PART - C

Essay(K3) (3 out of 5) (3 x 10 = 30)

CA QUESTION PAPER PATTERN -UG

Knowledge Level	Section	Word Limit	Marks	Total
K1	A-10/12x2 marks	50	20	75
K1, K2	B-5/8x5 marks	150	25	
K2, K3	C- 3/5x10	300	30	

CORE PAPER AND ALLIED

(PRACTICAL)

Practical

Max Marks : 75

B.SC. PHYSICS
SEMESTER - I
PAPER – 1 : PROPERTIES OF MATTER AND SOUND

TOTAL HOURS: 5

COURSE CODE : 172201

CREDITS: 4

COURSE OBJECTIVES:

1. To provide a strong foundation in the basics of matter and their properties.
2. To study the nature of sound, its effect and importance of various instruments.
3. To develop practical knowledge for doing experiments in related fields.

UNIT – I : ELASTICITY

Hooke's Law - Stress - Strain Diagram - Elastic moduli - Relation between elastic constants - Poisson's Ratio - Expressions for Poisson's ratio in terms of elastic constants - Work done in stretching and twisting a wire - Twisting couple on a cylinder - Rigidity modulus by static torsion - Torsional pendulum - Rigidity modulus and moment of inertia.

UNIT – II: BENDING OF BEAMS

Cantilever - Expression for bending moment - Expression for depression - Young's modulus - Non-uniform bending - Experiment to determine Young's modulus by Koenig's method - Uniform bending - Expression for elevation - Experiment to determine Young's modulus using microscope.

UNIT – III : SURFACE TENSION

Definition and dimensions of surface tension – Surface film and Surface Energy – Excess of pressure over curved surfaces - Application to spherical and cylindrical drops and bubbles - Variation of Surface tension with temperature - Jaeger's method – Drop weight method (theory and experiment)

Co-efficient of viscosity and its dimensions critical velocity- Rate of flow of liquid in a capillary tube - Poiseuilles formula - Experiment to determine co-efficient of viscosity of a liquid – Stoke’s method — Comparison of viscosities burette method -Applications of viscosity.

UNIT – V : ACOUSTICS AND ULTRASONICS

Acoustics- conditions for acoustically good buildings- Reverberation time- measurement of reverberation formula-Absorption coefficient-Measurement of absorption coefficient-Musical sound and noise.

BOOKS FOR STUDY

1. Properties of Matter by Murugesan. R.S. Chand & Co Pvt. Ltd., New Delhi, 1994.
2. Properties of Matter by Brij Lal & Subramaniam. N, Eurasia publishing Co.. New Delhi, 1989.

BOOKS FOR REFERENCE

1. Elements of Properties of Matter by Mathur D.S., Shyamlal Charitable Trust. New Delhi, 1993.
2. Fundamentals of General Properties of Matter by Gulati H.R., R.Chand & Co, New Delhi, 1982.
3. Mechanics General Properties of Matter by P.K. Chakrabarthy - Books & Allied (P) Ltd., 2001.

LIST OF JOURNALS

1. Journal of Elasticity (International)
2. International Journal of Mechanical Engineering & Applications
3. International Journal of Fluid Mechanics and Thermal Physics
4. Applied Acoustics
5. Journal of Vibration and Acoustics (International)

LIST OF WEBSITES

1. http://Fariside.ph.utexas.edu/teaching/301/lectures/node_139.html
2. http://www.tf.uni-kiel.de/matwis/amat/iss/kap_c/illustr/sc_2_3.html
3. <http://www.dataphysics.de/2/start/understanding-interfaces/baiscs/>
4. <https://hyperphysics.phy-astr.gsu.edu/hbase/dropp.html>
5. https://www.techglads.com/cse/sems/production_of_ultrasonics-by-piezoelectric-methods/

COURSE OUTCOMES:

CO Number	CO STATEMENT
	After completion of the course the students

CO1	Have a deft understanding of modulus of elasticity, develop their problem solving capacity and their analytical thinking.
CO2	Develop technical skills by understanding and thereby performing experiments relating to bending of beams.
CO3	Are endowed with knowledge of the behavior of matter regarding surface tension and viscosity.
CO4	Realize the effect of sound and its importance.
CO5	Apply their basic knowledge in sound to build and operate sound systems.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	2
CO2	3	3	2	3	2
CO3	3	2	2	2	2
CO4	3	2	3	2	1
CO5	2	3	2	3	1
AVERAGE	2.8	2.5	2.4	2.6	1.6

SEMESTER - I

PAPER – 2 THERMAL PHYSICS AND THERMODYNAMICS

TOTAL HOURS: 5

COURSE CODE : 172202

CREDITS: 4

COURSE OBJECTIVES:

1. The course emphasizes on the systematic study and measurement of heat an essential aspect in Physics.

2. To gain a sound knowledge of Thermodynamics and heat engines
3. Designed to give an insight about the importance of Maxwell's thermodynamic equations and its applications.

UNIT – I : THERMOMETRY AND CALORIMETRY

Platinum resistance thermometer - Callendar & Griffith's bridge – Thermister – Specific heat capacity – Specific heat capacity of solids – Dulong & Petit's law - Specific heat capacity of liquids – method of mixtures – Barton's correction - Specific heat capacity of gases - Determination of C_p by Regnault's method – Determination of C_v by Joly's Differential Steam calorimeter - Variation of specific heat capacity of diatomic gases.

UNIT – II: CONDUCTION AND RADIATION

Definition of thermal conductivity - thermal conductivity of a bad conductor - Lee's disc method – radiation – Black body radiation – Wien's law, Rayleigh-Jean's law and Planck's law – Stefan's law - Determination of Stefan's constant - Newton's law of cooling from Stefan's law – Pyrometry – Solar constant – Sources of solar energy – some practical everyday applications.

UNIT – III : LOW TEMPERATURE PHYSICS

Joule Kelvin effect – porous plug experiment - Liquefaction of gases (air, Hydrogen, Helium) - Adiabatic demagnetisation - practical applications of low temperatures - refrigerating machines - electroflux refrigerator – Frigidaire – air conditioning machines – effects of CF_2Cl_2 on ozone layer .

UNIT – IV : THERMODYNAMICS

Zeroth law of thermodynamics – First law of thermodynamics – Heat engines – petrol and diesel engines – reversible and irreversible processes – Second law of thermodynamics – thermodynamic scale of temperature – Entropy – change of entropy in reversible and irreversible processes – T-S diagram – Third law of thermodynamics.

UNIT – V : MAXWELL'S THERMODYNAMIC EQUATIONS

Maxwell's thermodynamic equation and its application to latent heat equations – Helmholtz function – Thermodynamic potential – Third law of thermodynamics - Enthalpy

BOOKS FOR STUDY

1. Heat and Thermodynamics - D.S. Mathur, Sultan Chand & sons
2. Heat and Thermodynamics- Brij Lal and Subramaniam , S. Chand & Co. 16th Edition.

BOOKS FOR REFERENCE

1. Heat and Thermodynamics- J.B. Rajam & C.L. Arora
2. Thermodynamics and Statistical Physics - Sharma & Sarkar
3. Fundamentals of Physics, 6th Edition, by D.Halliday, R.Resnick and J.Walker, Wiley, NY, 2001.
4. Thermal Physics, A.B. Gupta and H.Roy, Books and Allied (P) Ltd., (2002)

LIST OF JOURNALS

1. Journal Of Thermal Physics And Calorimetry
2. International Journal of Theoretical Physics.
3. Journal of American Chem. Soc. 1921,43(7), 1452-1470.
4. American Journal of Physics, 77, 922 (2009).
5. Journal of Mathematical Physics, Vol.10, Issue9, 1699 (1969).

LIST OF WEBSITES

1. Ww.khanacademy.org./laws of thermodynamics.
2. Ww.phys.libretexts.org./Temperature_and _ Heat.
3. Ww.khanacademy.org./thermal-conduction-convection-and – ration.
4. <http://www.britania.com/science/thomson> effect
5. www.knowino.org./wik/maxwell_equation_(thermodynamics):html

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Understand the nature of heat and familiarize with the various experiments connected with it.
CO2	Study the basics of heat transfer – conduction and radiation and some practical everyday applications.
CO3	Gain an awareness of the principle and working of low temperature based apparatus.
CO4	Acquire a knowledge of the two laws of thermodynamics and the operation of heat engines.
CO5	Get well acquainted with Maxwell's thermodynamical equations and third law of thermodynamics.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	3
CO2	3	2	2	3	2
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	1	2	2	2
AVERAGE	3	2.4	2.4	2.8	2.6

SEMESTER – II

PAPER 3: C PROGRAMMING

TOTAL HOURS: 6

COURSE CODE : 172203

CREDITS: 4

COURSE OBJECTIVES:

1. To gain knowledge in fundamental of C Programming .
2. To understand the syntax and develop the programs with logical thinking
3. To write and execute simple programs in C Language.

UNIT I: Introduction to C:

Importance of C – Basic structure of C programs – Programming Style. Constants, Variables and Data Types: Character Set, Keywords and Identifiers – Constants – Variables – Data Types – Declaration of Variables – Assigning values to Variables.

UNIT II : Operators in C

Operators and Expressions: Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional, Bitwise, Comma operators – Arithmetic expressions – Precedence and Associativity.

UNIT III: Input Output Operator, Control Structure and Arrays:

getchar, putchar, Formatted output (printf) and Formatted input (scanf).

Decision making with if, if-else, switch, goto, break and continue statement, while, do while, for statements.

One-dimensional and two-dimensional arrays, declaring arrays, storing arrays in memory – Initialising arrays.

UNIT IV: Functions, Structures and Union:

Basic functions – Return values and their types – Calling functions – Function arguments – External variables and Scope rules.

Structures – Arrays of Structures – Arrays within Structures – Structures – Structures and Functions – Unions.

UNIT V: Programs:

Development of algorithm, flowchart and program for the following problems:

1. Average of a set of numbers.
2. Conversion of Fahrenheit to Celsius.
3. Solving Quadratic equation.
4. To add/subtract/multiply two matrices.
5. To find the smallest and largest element in an array.
6. Sorting a set of numbers in ascending/descending order.
7. To arrange the names in alphabetical order.

Books for Study:

1. E. Balagurusamy, Programming in ANSI C, Tata McGraw-Hill.
2. Byron. S, Gottfried – Schaum's Outline Series – Theory and Problems of programming with C, McGraw Hill International.

Books for Reference:

1. Venugopal, K.R. and Sudep R.P., *Programming with C*, Tata McGraw Hill, 1998.
2. Herbert Schildt, *Teach Yourself C*, Osborne, McGraw Hill

LIST OF JOURNALS

1. International Conference Journal Of Young Computer Scientist, Engineers And Educators
2. International Journal of Science and Research

LIST OF WEBSITES

1. <https://www.programiz.com/c-programming/c-operators>
2. <https://www.sciencedirect.com/science/article/pii/S1877705811020534>
3. www.quora.com/basic-structures-of-C-program
4. www.vssut.ac.in/lecture_notes/lecture1424354156
5. <https://www.programiz.com>

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Appreciate the necessity of the 'C' as high level language
CO2	To gain knowledge of operators in C language.
CO3	To understand the usage of Input , Output and control structure
CO4	To widen the knowledge of C Language by incorporating functions, structures and union
CO5	To write and execute simple programs in C language

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	3	2	2
CO2	3	2	2	2	2
CO3	3	2	2	2	2
CO4	3	2	3	3	2
CO5	2	3	3	3	3
AVERAGE	2.8	2	2.6	2.4	2.2

SEMESTER – II

PAPER –4: CORE PRACTICAL - 1

(At the end of Second semester)

TOTAL HOURS: 6

COURSE CODE : 172204

CREDITS: 4

COURSE OBJECTIVES:

1. Develop data analysis skill using a variety of experiments.

2. Expose the students to experiments in Properties of Matter, Sound, Light and Electricity.
3. Complete an experimental work and report the outcome of the experiment to the faculty.

EXPERIMENTS

1. Young's modulus - Non-uniform bending - Pin & microscope.
2. Young's modulus - Uniform bending - Optic lever.
3. Rigidity modulus - Torsional pendulum (without identical masses).
4. Rigidity modulus and moment of inertia - Torsional pendulum (with identical masses).
5. Surface tension and interfacial surface tension-drop weight method
6. Coefficient of viscosity of liquid - Graduated burette (radius of capillary tube by Mercury pellet method)
7. Sonometer - frequency of tuning fork
8. Sonometer - RD of a solid and liquid
9. Specific heat capacity of a liquid - Newton's law of cooling.
10. Specific heat capacity of liquid - Method of mixtures (Half - time correction).
11. Focal length, Power, R and μ of a concave lens
12. Spectrometer - μ of a liquid.
13. P.O. Box - Temperature coefficient of resistance
14. Potentiometer - calibration of low range voltmeter

Note ; Use of Digital balance is permitted

BOOKS FOR REFERENCE

1. A Laboratory manual of Physics for UG Course by B.P.Khandalwal.
2. Advanced Practical Physics by Worsnop and Flint.
3. A Text Book of Practical Physics by M.N.Srinivasan, S.Chand & Co.
4. Practical Physics by M.Arul Thalpathi, Comptek Publishers.

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Able to develop technical skills.

CO2	Understand the concept of modulus of elasticity by observing its response to different conditions.
CO3	Have practical knowledge of determining constants like refractive index of lens, frequency of sonometer.
CO4	Ascertain the values of specific heat capacities by different methods
CO5	Calibrate meters using potentiometer.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	2	3	3	3	3
CO5	2	3	3	3	3
AVERAGE	2.6	3	3	3	3

SEMESTER - III

PAPER – 5 : OPTICS & SPECTROSCOPY

TOTAL HOURS: 4

COURSE CODE : 172205

CREDITS: 4

COURSE OBJECTIVES:

1. To discover the various aspects of light.
2. To gain knowledge in the areas of geometrical optics, interference, diffraction and polarization.
3. Develop proficiency in experimental study of Raman effect and IR spectroscopy by analyzing its concept.

UNIT -1 : GEOMETRICAL OPTICS

Dispersion produced by a thin prism - Angular dispersion - Dispersive power -Cauchy's formula (No derivation) - Spherical aberration – Methods of minimizing spherical aberration - Condition for minimum spherical aberration by combination of two thin lenses - Chromatic aberration in lenses – Circle of least confusion - Condition for achromatism with two thin lenses (in contact and out of contact).

UNIT - II : INTERFERENCE

Interference in thin films due to reflected system – Fringes due to wedge shaped thin film (Air wedge) - Determination of the diameter of thin wire by air wedge - Test for optical flatness - Newton's rings & its application - Michelson's interferometer - Determination of λ of monochromatic light.

UNIT - III : DIFFRACTION

Fresnel & Fraunhofer classes of diffraction – Fresnel's explanation for rectilinear propagation of light - Zone plate – Action and construction – Comparison with a convex lens - Fresnel diffraction at a straight edge - Fraunhofer diffraction at single slit, double slit & N slits – Theory of plane diffraction grating -Determination of wavelength (Normal incidence) and minimum deviation – Resolving power and dispersive power of grating - Absent spectra - overlapping spectra – Comparison between prism and grating spectra.

UNIT - IV : POLARISATION

Double refraction - Nicol prism – Nicol prism as polarisor and analyser - Quarter wave plate & half wave plate – Plane, partially, elliptically & circularly polarized light – their production & detection – Optical activity - Laurentz half shade polarimeter – Determination of specific rotatory power.

UNIT - V : SPECTROSCOPY

IR spectroscopy – IR spectrum – IR sources – Wadsworth spectrograph – uses of IR rays - Raman effect – Experimental study - Explanation on the basis of quantum theory – Applications of Raman effect.

BOOKS FOR STUDY

1. Optics and spectroscopy by R Murugesan, S.Chand & Co., Pvt Ltd., New Delhi
2. Optics by Subramaniam, N& Brij Lal, S.Chand & Co. Pvt Ltd., New Delhi
3. Optics by K.R.Khanna & H.R. Gulati, R.Chand & Co. Pvt Ltd., New Delhi.

BOOKS FOR REFERENCE

1. Fundamentals of optics by Jenkins A Francis and White E. Harvey. Me Graw Hill Inc. New Delhi
2. Introduction to Fibre Optics - Ajoy Gatak & K. Thyagarajan, McGraw Hill, New Delhi.
3. Fundamentals of Physics by D.Halliday, R Resnick & J Walker, Wiley, NY.
4. Fundamentals of optics by Raj M.G.Anmol publications Pvt. Ltd.

LIST OF JOURNALS

1. **Journal of the Optical Society of America A**, Vol. 13, Issue 12, pp. 2341-2347 (1996)
2. Journal of the European Optical society – rapid publication 2016,12-17
3. American Journal of Physics 47, 239 (1979)
4. [Physics Education](#), Volume 7, Number 7(2013)
5. J. Chem. Educ.19603712651, 1960

LIST OF WEBSITES

1. www.semanticscholar.org/Dispersion-aberration-and-deconvolution-in-images
2. https://spie.org/publications/fg10_p11_newtons_rings
3. <https://www.spiedigitallibrary.org/ebook/-Optical-Wave-Propagation- Fraunhofer-Diffraction-and-Lenses>
4. <https://www.britannica.com/science/double-refraction>
5. <http://www.rsc.org/learn-chemistry/collections/spectroscopy/introduction>

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Solve and understand the principles of dispersion and aberrations.

CO2	Gain a thorough knowledge of interference and experiments related to it.
CO3	Study the different classes of diffraction.
CO4	Obtain an insight into the wave nature of polarized light.
CO5	Get knowledge of the basics of spectroscopy useful for research studies .

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	2
CO2	3	3	3	3	3
CO3	3	2	2	2	2
CO4	3	3	2	2	2
CO5	3	3	3	3	3
AVERAGE	3	2.6	2.6	2.6	2.4

SEMESTER III

PAPER – 6 : ELECTRICITY AND MAGNETISM

TOTAL HOURS: 4

COURSE CODE : 172206

CREDITS: 4

COURSE OBJECTIVES:

1. To inculcate scientific thinking and analyse Theorems and principles relating to electricity.
2. Gain knowledge of currents through theory and practical.
3. Understand the concept of magnetism and Terrestrial Magnetism

UNIT - I : ELECTROSTATICS

Coulomb's law - electric intensity and electric potential - electrical images -electric intensity and potential due to an earthed conducting sphere applying the principle of electric images – Gauss law with proof – Application – Electric field intensity due to a uniformly charged sphere - capacity - capacitance of a spherical and cylindrical capacitor - energy of a charged capacitor - loss of energy due to sharing of charges.

UNIT - II : THERMOELECTRICITY

Thermoelectricity - Peltier coefficient - Thomson coefficient - application of thermodynamics to a thermocouple and connected relations - thermoelectric diagram and uses – measurement of thermo emf by using a potentiometer.

UNIT - III : DC CIRCUITS

Growth and decay of current in a circuit containing resistance and inductance

- Growth and decay of charge in a circuit - containing resistance and capacity -growth and decay of charge in a LCR circuit - condition for the discharge to be oscillatory - frequency of oscillation – DC generator.

UNIT - IV : ALTERNATING CURRENTS

Peak, average and RMS values of AC voltage and current - power factor and current values in an AC circuit containing LCR (reactance and impedance) - series and parallel resonant circuits - power in an AC circuit - wattless current- choke coil - construction and working of transformers - energy losses – motors - single phase, three phase- star and delta connections.

UNIT - V : MAGNETIC PROPERTIES OF MATERIALS

Susceptibility-permeability - intensity of magnetization and the relation $B = \mu_0(H + I)$, I-H and B-H curves for a magnetic material using magnetometer method and ballistic galvanometer method. Terrestrial magnetism - magnetic elements-dip circle - Kew magnetometer-causes of earth's magnetic field.

BOOKS FOR STUDY

1. Electricity & Magnetism, Narayanamurthy & N.Nagarathnam, National Publishing company, Revised edition.
2. Electricity & Magnetism, K.K.Tewari, S.Chand & Co. 3rd Edition, 2001.
3. Electricity and Magnetism, R. Murugesan, S.Chand and Co. New Delhi.

BOOKS FOR REFERENCE

1. Electricity & Magnetism, BrijLal & Subramaniam.
2. Electricity & Magnetism, D. Chattopadhyay, Books & Allied Publishers.
3. Text book of applied Electronics, R.S. Sedha, SChand & Co. New Delhi, 2002.
4. Fundamentals of Physics, 6th Edition, D.Halliday, R.Resnick and J.Walker, Wiley, NY, 2001.
5. Physics, 4th Edition, Vols 1,2 & 2 Extended, D. Halliday, R.Resnick and K.S.Krane, Wiley, NY, 1994.
6. CRC Handbook of Physics & Chemistry, 8th Ed., CRS Press NY, 1999.
7. The Feynmann Lectures on Physics, Vol. 1,2 and 3, R.P. Feynman, R.B Leighton and M.Sands, Narosa, New Delhi, 1998.
8. Basic Electronics, 6th Edition, B. Grob, McGraw-Hill, NY, 1989.

LIST OF JOURNALS

1. [European Journal of Physics, Volume 19, Number 2](#)
2. International Journal of Thermal Sciences, Volume 66, April 2013, Pages 1-7
3. American Journal of Physics 74, 429 (2006)
4. International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol. 6, Issue 11, November 2017.

LIST OF WEBSITES

1. <https://www.electrical4u.com/gauss-theorem/>

2. <https://www.tutorhelpdesk.com /Physics-/Uses-Of-Thermoelectric-Diagram-.html>
3. http://www.electronics.org/ac_theory/lcr_series
4. <https://www.tecnicscarpi.com/en/single-phase-and-three-phase-generators-differences-advantages-and-disadvantages/>
5. https://www.physik.tu-dresden.de /teaching/thmag_w09/lecturenotes.pdf

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Study capacitors, Gauss theorems, its applications and its impact on modern technologies.
CO2	Analyse the different thermoelectric effect.
CO3	Understand DC circuits for device applications and solve problems in that field.
CO4	Are provided with a sound foundation in AC circuits and their role in the working of instruments.
CO5	Acquire knowledge about magnetic properties and Terrestrial magnetism.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	2
CO2	2	2	3	2	2
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	2	2	2	2
AVERAGE	2.8	2.4	2.6	2.4	2.4

SEMESTER - IV

PAPER – 7 : ELECTROMAGNETISM

TOTAL HOURS: 5

COURSE CODE : 172207

CREDITS: 4

COURSE OBJECTIVES:

1. To acquire knowledge of electromagnetism and theorems related to it.
2. To develop a working knowledge of different instruments.
3. Empower the students to analyse and solve problems relating to electromagnetic radiations.

UNIT-I : MAGNETIC EFFECT OF AN ELECTRIC CURRENT

Magnetic field around a current carrying conductor – Lorentz force – Ampere's circuital law - Biot and Savart's law -Magnetic field intensity at a point on the axis of a circular coil carrying current magnetic field intensity due to a solenoid carrying current - Helmholtz galvanometer - moving coil ballistic galvanometer - theory -damping correction. Determination of the absolute capacity of a condenser using B.G.

UNIT – II : ELECTROMAGNETIC INDUCTION

Faraday's experiments on electromagnetism - Faraday's laws of Electromagnetic Induction - Lenz's law - Inductors and inductance - determination of self inductance of a coil using Anderson method - Mutual inductance -experimental determination of absolute mutual inductance using B.G. - coefficient of coupling – Eddy currents

UNIT - III : APPLICATION OF ELECTROMAGNETIC INDUCTION

Earth inductor - uses of earth inductor - measurement of horizontal component of the earth's magnetic field - measurement of vertical component of earth's magnetic field- Measurement of

intense magnetic field using search coil and BG-Calibration of B.G. using solenoid inductor - Induction coil and its uses.

UNIT- IV MAXWELL'S EQUATIONS AND ELECTROMAGNETIC THEORY

Types of currents - vacuum displacement current - Maxwell's equations - Maxwell's equations in free space - electromagnetic waves in free space-wave equation for E and H - energy density of e.m wave - Poynting's theorem - energy per unit volume.

UNIT – V: ELECTROMAGNETIC WAVES IN MATTER

Propagation of EM waves in linear media – Boundary conditions at the surface of discontinuity - Reflection and Transmission at normal incidence and oblique incidence – Fresnel's equations – Transmission and Reflection coefficients -Brewster angle.

BOOKS FOR STUDY

1. Electricity & Magnetism, Narayanamurthy & N.Nagarathnam, National Publishing Company, Revised edition.
2. Electricity & Magnetism, K.K.Tewari, S.Chand & Co. 3rd Edition, 2001.
3. Electricity and Magnetism, R. Murugesan, S.Chand and Co. New Delhi
4. Electricity and Magnetism, Satyaprakash, Pragati Prakashan, Meerut

BOOKS FOR REFERENCE

1. Electricity & Magnetism, BrijLal & Subramaniam.
2. Electricity & Magnetism, D. Chattopadhyay, Books & Allied Publishers.
3. Electricity and Magnetism, D.L.Sehgal, K.L. Chopra and N.K. Sehgal, S.Chand and Co. New Delhi
4. Fundamentals of Physics, 6th Edition, D.Halliday, R.Resnick and J.Walker, Wiley, NY, 2001.

LIST OF JOURNALS

1. [IEEE Transactions on Education](#), Volume,25(1),Feb. 1982.
2. J. Chem. Educ.20128991208-1209, 2012
3. Journal of Electromagnetic Waves and Application

LIST OF WEBSITES

1. <https://www.electrical4u.com/biot-savart-law/>
2. <https://www.khanacademy.org/science/magnetic-forces-and-magnetic-fields/faradays-law>

3. <http://www.mcm.edu/~bykov.tikhon/TheInductor.htm>
4. <https://www.electronics-tutorials.ws/electromagnetism/electromagnetic-induction.html>

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Understand the effect of magnetic field on the flow of current and its application in Ballistic galvanometer.
CO2	Study the laws of electromagnetism.
CO3	Gain knowledge of the principle and working of Earth Inductor and Induction coil.
CO4	Made aware of the impact of electromagnetic radiations in nature.
CO5	Develop a conceptual understanding of electromagnetic radiations.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	3
CO2	3	3	2	2	2
CO3	3	3	2	3	3
CO4	3	2	2	2	2
CO5	3	2	2	2	2
AVERAGE	3	2.6	2	2.4	2.4

SEMESTER – IV

PAPER-8: CORE PRACTICAL - 2
(At the end of Fourth semester)

TOTAL HOURS: 4

COURSE CODE : 172208

CREDITS: 4

COURSE OBJECTIVES:

1. Correlate theoretical and practical knowledge.
2. Make measurements accurately and analyse the results..
3. Do experiments in Properties of Matter, Heat, Light and Electricity.

EXPERIMENTS.

1. Young's modulus - Cantilever - depression - (Static - method)-Scale and telescope).
2. Rigidity modulus - Static torsion
3. Surface Tension of a liquid (Capillary Rise method)
4. Sonometer - A.C. frequency - Steel and Brass wires
5. Melde's string - frequency of the Vibrator
6. Melde's string - R.D. of Solid and Liquid
7. Specific heat capacity - Joule's calorimeter - Barton's radiation correction
8. Thermal Conductivity of a bad conductor - Lee's disc method
9. Spectrometer - μ of a glass prism i-d Curve
10. Spectrometer - Grating N and λ - normal incidence method
11. Spectrometer -Grating N and λ - minimum deviation method
12. Air wedge - Thickness of a wire
13. m and B_H - deflection manetometer Tan C position and vibration magnetometer
14. Potentiometer - Ammeter calibration
15. Potentiometer- Resistance and specific resistance of a wire
16. Figure of merit of galvanometer (Table Galvanometer)

Note : Use of Digital balance is permitted

BOOKS FOR REFERENCE

1. A Laboratory manual of Physics for UG Courses by B.P.Khandalwal
2. Advanced Practical Physics by Worsnop and Flint.
3. A Text Book of Practical Physics by M.N.Srinivasan, S.Chand & Co.
4. Practical Physics by M.Arul Thalpathi, Comptek Publishers.

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Able to study and obtain the values of modulus of elasticity by different experiments.
CO2	Understand the conductivity of heat through liquid and materials and thereby determining the constants –thermal conductivity and specific heat.
CO3	Have a practical knowledge of the wavelengths of light.
CO4	Calibrate meters and determine specific resistance using potentiometer.
CO5	Study the sensitiveness of meters – figure of merit.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

SEMESTER-V
PAPER – 9 : ATOMIC PHYSICS

TOTAL HOURS: 4

COURSE CODE : 172209

CREDITS: 4

COURSE OBJECTIVES:

1. To understand the chronological development in the concept of atoms models and thereby have a knowledge of the structure of atoms.
2. To explain atomic spectra and phenomena like Zeeman, Anomalous Zeeman and Stark effect based on Vector Atom model.
3. To study positive rays, photoelectric effect, X rays and their applications..

UNIT - I : POSITIVE RAY ANALYSIS

Production of positive rays - properties - e/m of positive rays - Thomson's parabola method - Aston's. Bainbridge and Dempster's mass spectrograph - uses of mass spectrographs.

UNIT - II : PHOTOELECTRIC EFFECT

Photoelectric emission - Leonard's experiment - Richardson and Compton experiment - laws of photoelectric emission - failure of the electromagnetic theory in the explanation of photoelectric emission - quantum theory - Einstein's photoelectric equation - Millikan's experiment for verifying Einstein's equation - photoelectric cells and their applications.

UNIT - III : ATOM MODELS

Atom models - Bohr atom model - Sommerfeld's relativistic atom model and explanation of the fine structure of the $H\alpha$ line – Vector atom model - Basic postulates - various quantum numbers associated with it - coupling schemes - Pauli's exclusion principle - selection rules - Application of Pauli's exclusion principle in the periodic classification of elements with few examples - Magnetic dipole moment of electron due to orbital and spin motion - Bohr magneton - Stern and Gerlach experiment.

UNIT - IV : FINE STRUCTURE OF SPECTRAL LINES

Critical potential - Excitation and Ionisation potential - Frank and Hertz experiment - Davis & Goucher's experiment - Spectral terms and notations - intensity rules and selection rule - fine structure of sodium D lines - Zeeman effect - Larmor's precession - quantum mechanical explanation

of Zeeman effect -Anomalous Zeeman effect with theory (D_1 , D_2 lines) - Paschen - Back effect -Stark effect (Experiment & Results).

Unit-V : X-RAYS

Production and properties X-Rays - Diffraction of X-Rays by Crystals – Bragg's Law in one dimension. Braggs X-ray spectrometer – Laue method – Rotating Crystal method – Powder photographic method – Von Laue Equation.

BOOKS FOR STUDY

1. Modern Physics by R.Murugesan
2. Modern Physics Sehgal & Chopra

BOOKS FOR REFERENCE

1. Atomic physics by J.B.Rajam
2. Atomic & Nuclear Physics N.Subramaniam & Brij Lal S.Chand & Co.
3. Concepts of Modern Physics by A. Beiser.
4. Physics 4th Edition Vols 1, 2 & 2 extended by D.Halliday, R.Resnick and K.S. Krane, Wiley Ny 1996.
5. The Feynman Lectures on Physics Vol 1, 2 and 3 by R.P.Feynman, R.B. Leighton and M Sands, Narosa Publishers, New Delhi 1998.

LIST OF JOURNALS

1. *Historical Studies in the Physical and Biological Sciences*
Vol. 18, No. 2 (1988), pp. 265-310.
2. iopscience.iop.org/volume/0143-0807/32
3. J. Chem. Educ.1948,25,5,260
4. International Journal of Optics Volume 2013, Article ID 213684, 5 pages
5. J. Chem. Educ.1958,35,2,80

LIST OF WEBSITES

1. <http://www.quantumstudy.com/cathode-rays-positive-rays/>
2. <https://www.khanacademy.org/science/physics/quantum-physics/photons/a/photoelectric-effect>
3. <https://www.siyavula.com/the-atom/04-the-atom-02>.
4. <http://www.pas.rochester.edu/zeeman-split.html>.
5. https://www.radiologymasterclass.co.uk/x-ray_physics_introduction

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Get to understand positive rays and mass spectrographs like Aston, Dempster and Bainbridge and its impact in determining the masses of isotopes.
CO2	Appreciate the phenomenon of photoelectric effect and its usage in devices.
CO3	Study the different models and thereby give an explanation for the atomic spectra
CO4	Have ability to analytically explain Zeeman effect and Anomalous Zeeman effect
CO5	Realize the importance of X rays, its properties and applications .Solve problems with regards to the crystals.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	3
CO2	3	3	2	3	3
CO3	3	2	2	2	2
CO4	3	2	3	2	2
CO5	2	3	3	3	3
AVERAGE	2.8	2.6	2.4	2.6	2.6

SEMESTER - V

PAPER - 10 : MECHANICS, MATHEMATICAL METHODS AND RELATIVITY

TOTAL HOURS: 4

COURSE CODE : 172210

CREDITS: 4

COURSE OBJECTIVES:

1. To develop engineering skills to tackle problems in Mechanics and Hydrodynamics.
2. To study the special functions and solutions for Bessel and Hermite equations.
3. To emphasize on the significance of Special theory of relativity.

UNIT –I : MECHANICS

Impulse - Impact - Laws of impact - direct impact and oblique impact between two smooth spheres - loss of kinetic energy - motion of two interacting bodies - reduced mass. Compound pendulum - theory - equivalent simple pendulum - reversibility of centres of oscillation and suspension - determination of g and k - Bifilar Pendulum -parallel threads -Experimental verification of perpendicular axes theorem.

UNIT - II : GRAVITATION AND CENTRE OF GRAVITY

Newton's law of gravitation —Boy's method of determination of G - Kepler's laws – Deduction of Newton's law from Kepler's law - orbital velocity and escape velocity - Geo-stationary and Communication Satellites - Centre of gravity of solid tetrahedron, solid and hollow hemisphere, Solid and hollow cone.

UNIT-III : HYDRODYNAMICS

Equation of continuity of flow - Venturimeter - Pitots tube for liquids - Eulers equation for unidirectional flow - Torricelli's theorem - Bernoulli's theorem and applications - Laws of floatation - metacentre - metacentric height of a ship - Atmospheric pressure - its variations with altitude - reasons for such variations.

UNIT - IV : MATHEMATICAL METHODS

Characteristic equation of a matrix – Roots and Characteristic vector - Cayley Hamilton theorem - eigen values -- eigen vectors - diagonalisation of 3×3 real Symmetric matrices- Problems - Special functions - Gamma and Beta Functions - series solutions for Bessel and Hermite equations.

UNIT- V : RELATIVITY

Frame of reference - Gallilean transformation - Michelson - Morley experiment - Postulates of special theory of relativity - Lorentz transformation - Length contraction - Time dilation -Relativity of simultaneity - Variation of mass with velocity - Mass energy equation - Elementary ideas of general theory of relativity.

BOOKS FOR STUDY

1. Mechanics - Part I & II by Narayanamoorthy National Publishing company
2. Mathematical Physics - Sathya Prakash.
3. Mechanics & Mathematical Methods by Murugesan.
4. Modern Physics by Murugheshan.
5. Properties of matter by D.S. Mathur, S. Chand & Co.

BOOKS FOR REFERENCE

1. Mechanics - D.S. Mathur - S. Chand & Co, II Edition, 2001.
2. Mathematical Physics - B.D. Gupta.
3. Advanced Engineering mathematics 8th Edition by Kreyszig, E, Wiley Publication, NY 1989.
4. Mathematical Physics by Ghatak A.K. Gayal I.C., Chakra S.G., MacMillan, New Delhi, 1995.
5. Fundamental of Physics 6th Edition D Halliday, R.Resnick, J.Walker, Wiley NY, 2001.
6. Physics, 4th Edition Vol. 1, 2 & 2 Extended by D. Halliday, R.Resnick & K.S.Krane, Wiley NY, 1994.
7. CRC Handbook of Physics and Chemistry, 80th Edition, CRS Press, NY, 1999,
8. The Feynman Lectures on Physics, Vols. 1, 2 & 3 by R. P. Feynman, R.D.Leighton and M.Sands, Narosa, New Delhi, 1998.
9. Introduction to Special Theory of Relativity – Halliday, R. Resnick.

LIST OF JOURNALS

1. [American Journal of Physics](#) , [Volume 45, Issue 6](#) , 1998
2. [Journal-of-high-energy-physics-gravitation-and-cos](#)
3. American Journal of Physics 20, 86 (1952);
4. [World Applied Sciences Journal](#) 22(9):1272-1278 · May 2013
5. American Journal of Physics 20, 161 (1952)

LIST OF WEBSITES

1. http://www.schoolphysics.co.uk/Mechanics/Compound_pendulum/index.html
2. <https://physics.info/gravitation/>
3. <https://www.quora.com/Archimedes-Principle-and-the-Law-of-Floatation-state>
4. <https://www.jagranjosh.com/the-laws-of-floatation->
5. <http://www/Calculus/Calculus2/pagine/IntGB.pdf>
6. <https://www.space.com/36273-theory-special-relativity.html>

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Achieve a strong foundation in the mathematics of mechanics.
CO2	Understand the concept of gravitation.
CO3	Gain an insight of the principles and practical applications of floatation
CO4	Acquire a firm understanding of mathematical methods.
CO5	Appreciate the Special Theory of relativity and Einstein's mass –energy equations.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	3	2	2	2	2
CO3	3	3	3	3	3
CO4	3	2	3	3	3
CO5	3	2	2	2	2
AVERAGE	3	2.2	2.6	2.6	2.6

SEMESTER - V

PAPER- 11: ELECTRONICS AND COMMUNICATION

TOTAL HOURS: 4

COURSE CODE : 172211

CREDITS: 4

COURSE OBJECTIVES:

1. To understand the need for an active device.
2. To make use of these active devices in various circuits.
3. To appreciate the modulus used in communication system.

UNIT – I : SEMICONDUCTOR DIODES AND TRANSISTORS

Diode as a circuit element - Avalanche and Zener effect - Zener diode - voltage regulation using Zener diode - full wave rectifier using two diodes - efficiency and ripple factor - Bridge rectifier.

Transistor : Two port representation of a transistor - Hybrid parameters and equivalent circuit. Analysis of a common emitter amplifier using h parameters: expressions for current gain, voltage gain, input impedance, output impedance and power gain - Transistor biasing circuits.

UNIT – II : TRANSISTOR OSCILLATORS

Regenerative feed back - conditions for oscillation - Hartley oscillator - Colpitt's oscillator – Phase shift oscillator - Wien's bridge oscillator - expressions for frequency and condition for sustained oscillation in each case..

UNIT - III : WAVE SHAPING CIRCUITS AND MULTIVIBRATORS

Clipping and clamping circuits - Integrating and differentiating circuits – Output wave forms - RC time constants - Multivibrators - Astable, monostable and bistable multivibrators using transistors – Schmitt Trigger.

UNIT- IV : RADIO TRANSMISSION AND RECEPTION

Transmitter - Modulation - Need for modulation Types of Modulation - Amplitude, frequency and phase modulation - Modulation factor - Sideband frequency in AM wave – Limitations of AM modulation – Frequency modulation – Block Diagram of AM and FM transmitter.

Demodulation - Detection of AM wave - diode detection - Superhetrodyne receiver - Principle - Block diagram - Action of various stages – AGC.

UNIT-V : TELEVISION

TV Camera - Vidicon - Scanning - Composite video signal - TV transmitter - Block diagram - TV antenna- folded dipole - Yagi antenna - Principles of colour TV - Method of obtaining luminance and chrominance signals – TV monochrome receiver - Block diagram – Principle of satellite communication.

BOOKS FOR STUDY

1. Principles of Electronics - V.K. Mehta, S. Chand & Co
2. Basic Electronics - B.L. Theraja, S. Chand & Co
3. Elements of Electronics - M.K. Bagde, S.P. Singh & Kamal Singh, S. Chand & Co.
4. Television Engineering - Arvind M. Dhake., Tata McGraw Hill.
5. Hand book of electronics - Gupta and Kumar. Pragati Prakashan
6. Solid State Electronics – Vincent Devaraj & Ambrose.

BOOKS FOR REFERENCE

1. Monochrome and colour TV - Gulati.R.R, New Agencies International (P) Ltd. publication.
2. Electronic Principles - Malvino, Tata McGraw Hill.
3. Basic Television and Video systems - B.Grob, McGraw Hill, NY.

LIST OF JOURNALS

1. [Transactions of the IRE Professional Group on Electron Devices](#), Volume:2 , [Issue: 2](#) ,1953
2. International journal of circuit theory and application, [Volume](#)45, [Issue](#)12 December 2017
Pages 1993-
3. International journal of bifurcation and chaos, Vol.22 (1), 1250011 (2012).
4. Journal of Physics conference series, vol.839 (1),
5. [SMPTE Journal](#) (Volume: 98 , [Issue: 5](#) , May 1989

LIST OF WEBSITES

1. https://www.electronics-tutorials.ws/diode/diode_7.html
2. <https://www.electronics/oscillator/colpitts.html>
3. <https://www.quora.com/What-is-the-difference-between-clipping-and-clamping-circuits>
4. <https://byjus.com/physics/modulation-and-demodulation/>
5. <https://oseven.in/files/58c2cc1e2d67b.pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Gain knowledge about the active devices such as diodes and transistors.
CO2	Understand the principle of feedback to generate oscillatory circuits.
CO3	Design wave shaping circuits and multivibrators.
CO4	Understand Radio transmission and reception.
CO5	Understand the principle and working of antennae, Television and broadcasting system.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	2
CO2	3	3	3	3	3
CO3	2	3	3	3	3
CO4	3	2	2	2	2
CO5	3	3	2	2	2
AVERAGE	2.8	2.8	2.4	2.4	2.4

SEMESTER – V
PAPER- 12 : NUCLEAR PHYSICS

TOTAL HOURS: 4

COURSE CODE : 172212

CREDITS: 4

COURSE OBJECTIVES:

1. To appreciate the beauty of the nucleus.
2. To understand thoroughly radiation and its effects.
3. To delve deeper into the nucleus to study elementary particles.

UNIT - I : GENERAL PROPERTIES OF NUCLEI AND NUCLEAR ENERGY

Size, Charge, Mass, Spin-determination of nuclear radius - Mass defect - packing fraction - Binding energy - Semi empirical mass formula – Nuclear model- liquid drop model-Shell Model-magic numbers - Nuclear forces - Meson theory (qualitative).

Nuclear fission - chain reaction - Critical mass - controlled chain reaction - Nuclear reactors – Nuclear Fusion - thermonuclear reaction - Source of stellar energy.

UNIT - II : RADIOACTIVITY

Natural radioactivity - Half life, mean life and decay constant - Transient and secular equilibrium - Radioactive dating - Age of the earth - characteristics of α and β -ray spectra -Geiger Nuttal Law - Gamow's theory of α - decay (qualitative study) - line and continuous β spectra - Fermi's theory of β decay - Gamma ray spectra - Internal conversion - Nuclear isomerism.

UNIT - III : RADIATION DETECTORS, PARTICLE ACCELERATORS

GM counter - Scintillation counter - Cyclotron Synchrocyclotron - Betatron - electron synchrotron, Proton synchrotron.

UNIT - IV : ARTIFICIAL TRANSMUTATION OF ELEMENTS AND NEUTRON

Artificial transmutation - Rutherford's experiment - Nuclear reactions - scattering cross section - energy balance in nuclear reactions - Q value - Production and uses of radio isotopes.

Neutron - Discovery - sources and properties of neutrons - thermal neutrons – Neutron Collimator - slowing down of neutrons - Detection of neutrons.

UNIT- V : ELEMENTARY PARTICLES

Elementary particles- Interactions- conservation laws –Invariance under C.P.T reversal– Hadrons, Leptons, Mesons, Baryons -Hyperons- anti particles & antimatter- classification of elementary particles- strangeness- isopin – Quarks.

BOOKS FOR STUDY

1. Modern Physics by R.Murugeshan, S.Chand & Co.
2. Atomic and Nuclear Physics by Littlefield and Thorley

BOOKS FOR REFERENCE :

1. Nuclear physics by D.C. Tayal
2. Nuclear Physics by J.B.Rajam,S.C hand &Co
3. Perspectives of Modern Physics by Beiser, McGrew Hill
4. Concept of Modern Physics 5 th Edition by A.Beiser, Tata McGrew Hill, 1997
5. Seven wonders cosmos by J.Narlikar,Cambridge University press.

LIST OF JOURNALS

1. [American Journal of Physics](#), 28, 425 (1960);
2. Journal of JSTOR, Vol. 67, No. 1 (Mar., 1976), pp. 61-75
3. Journal of Applied Physics 11, 781 (1940)
4. Journal of clinical path. 13,369,1960.
5. American Journal of Physics 81, 397 (2013)

LIST OF WEBSITES

1. http://electron6.phys.utk.edu/phys250/nuclear_models.htm
2. <https://www2.lbl.gov/chapters/13/4.html>
3. <https://seintl.com/about-radiation-detectors-advantages-disadvantages/>
4. <https://byjus.com/physics/artificial-transmutation/>
5. <http://hyperphysics/Particles/hadron.html>

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Gain knowledge of the structure of the nucleus to study elementary particles
CO2	Acquire a comprehensive study of radiations, its uses and hazards
CO3	Have studied the existing radiation detectors and particle accelerators used for research work.
CO4	Obtain an extended knowledge about radio isotopes – production and uses and about neutrons
CO5	Will be educated on the basic constituents of all matter – the elementary particles about which research is carried out across the world.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	2
CO2	3	2	2	3	3
CO3	3	3	2	3	3
CO4	3	2	2	3	3
CO5	3	2	2	2	2
AVERAGE	3	2.2	2	2.6	2.6

SEMESTER - V

ELECTIVE PAPER- I

PAPER 13: LASER PHYSICS & FIBRE OPTICS

TOTAL HOURS: 5

COURSE CODE : 172213

CREDITS: 5

COURSE OBJECTIVES:

1. Expose the students to the details of Laser Physics, its potential applications in various fields
2. To equip the students with knowledge in Lasers and Fibre Optics suited to their use in industry and research.
3. To enable the students to learn the theory behind communications using optical fibres.

UNIT – I : LASER PHYSICS

Basic principles of Laser - Einstein Coefficients and their coefficients – condition for light amplification - Population inversion - Threshold condition – Optical resonators (Qualitative only) - Three level & four level systems – Characteristics of Laser.

UNIT- II : TYPES OF LASERS AND OUTPUT MODULATION METHODS

Ruby laser - Nd - YAG Laser - He-Ne laser, CO₂ Laser - Dye Laser - Semi Conductor Laser - Q switching and mode locking (qualitative) - Experimental methods.

UNIT - III : APPLICATIONS OF LASER

Applications of Laser in industry - cutting - welding - drilling - surface hardening - medical applications - laser as diagnostic and therapeutic tool - Holography -, theory of recording and reconstruction - holographic interferometry in nondestructive testing - lasers in optical communication.

UNIT-IV : OPTICAL FIBRES

Basic structure of an optical fibre - acceptance angle - Numerical aperture - propagation of light through an optical fibre - theory of modes formation - Classification of fibres - Step index and graded

index fibres - Comparison of the two types - Single mode and multimode fibres - losses in fibres - Dispersion in fibres - Fabrication of fibres.

UNIT - V : FIBRE OPTIC COMMUNICATION

Optical Communication - advantages - light sources - modulation methods - Photo detectors - Optical couplers - splicing - communication systems (Block diagram) - Repeaters - Fibre cables - measurements of numerical aperture and optical time domain reflectometers

BOOKS FOR STUDY

1. Laser theory and applications by K. Thyagarajan, A.K Ghatak, Cambridge University Press.
2. An introduction of Lasers, Theory and applications by Avadhanulu, M.N. S. Chand & Co., New Delhi, 2001.
3. Optical Fibres and Fibre Optic Communication System by Subir Kennar Sarkar, S. Chand & Co. New Delhi.

BOOKS FOR REFERENCE

1. Laser and non-laser optics by Land B.B., Wiley Easter Ltd. NY 1985.
2. Introduction to Lasers, Theory and Application by Avadhanulu M.N S.Chand and Co. New Delhi 2001.

LIST OF JOURNALS

1. Journal of Applied Physics 46, 5194 (1975)
2. Journal of Physics: Conference Series 415 (2013) 012051
3. [Proceedings of the IEEE](#) (Volume: 66 , [Issue: 7](#) , 744 - 780 July 1978)
4. Journal of Optics, vol.20, (7), 2018

LIST OF WEBSITES

1. <https://www.edmundoptics.com/lasers/fundamentals-of-lasers/>
2. <http://www.nitttrchd.ac.in//laser/SolidState Lasers and Applns>
3. <https://www.cemarelectro.com/laser-safety/laser-types-and-operation>
4. <http://holocenter.org/what-is-holography>
5. <https://www.explainthatstuff.com/fiberoptics.html>
6. <https://wiki.metropolia.fi/Physics/History+and+Application+Of+Fiber+Optics>

COURSE OUTCOMES:

CO Number	CO STATEMENT

After completion of the course the students	
C01	Obtain a firm foundation on the principle of Lasers.
C02	Able to transfer and apply their acquired knowledge to study different types of Lasers.
C03	Appreciate the applications of Lasers.
C04	Attain a good understanding of the basics of fibre optics which will be an added advantage for higher studies.
C05	Will be equipped for higher studies in optical communications.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
C01	3	2	2	3	3
C02	3	2	3	3	3
C03	3	2	3	3	3
C04	3	2	2	3	3
C05	3	3	3	3	3
AVERAGE	3	2.2	2.6	3	3

SEMESTER -VI

PAPER-14 : CLASSICAL, QUANTUM AND STATISTICAL MECHANICS

TOTAL HOURS: 4

COURSE CODE : 172214

CREDITS: 4

COURSE OBJECTIVES:

1. To demonstrate the gradual change from classical to quantum mechanics
2. To appreciate the beauty of quantum mechanics and how unexplained problems can be solved through quantum mechanics
3. To expose the students to the basic statistical laws which can be applied to bigger problems

UNIT - I : CLASSICAL MECHANICS

Constraints –Degrees of freedom - Generalised Co-ordinates, Generalised velocities -Transformation equations - Configuration space - Principle of virtual work - D'Alembert's principle - General form of Lagrange's equations – Applications of Lagrange's equation – Compound Pendulum and Atwood's machine.

UNIT - II WAVE NATURE OF MATTER

Dual nature of light - Dual nature of matter - De Broglie concept of matter waves -Wave velocity - Group velocity- Relation between the wave velocity and group velocity - Wave packet - Davison & Germer experiment -GP Thomson's experiment - Electron microscope - Heisenberg uncertainty principle.

UNIT - III WAVE MECHANICS

Inadequacies of classical theory for black body radiation - Planck's radiation law -Basic postulates of wave mechanics - Properties of wave function - Physical significance of wave function – Orthogonal and normalized wave function - Eigen values & Eigen function - Expectation values -Time dependent & independent Schrodinger's equation.

UNIT - IV APPLICATION OF WAVE MECHANICS

Particle in a box – Schrodinger equation for Linear harmonic oscillator - Hydrogen atom — Barrier penetration problem – Application of Barrier penetration (alpha decay).

UNIT -V STATISTICAL MECHANICS

Definitions of probability – Degrees of freedom – Statement of theorem of Equipartition of energy. Maxwell – Boltzmann Statistics – Expression for the distribution of energy by Maxwell, Bose-Einstein Statistics – Expression for the distribution of energy for Bose-Einstein gas, Fermi – Dirac Statistics –, Expression for energy of Fermi – Dirac gas – Comparison of three statistics.

BOOK FOR STUDY

1. Modern Physics by Murugesan, S.Chand & Co
2. Text book of Quantum Mechanics by P.M.Mathews & Venkatesan, McGraw Hill

BOOKS FOR REFERENCE

1. Nuclear Physics by Irving Kaplan , Narosa Publication, 2nd Edition.
2. Concepts of Modern Physics 5th Edition by A.Beiser, Tata McGraw Hill, 1997.
3. Quantum Mechanics by Ghatak and Loganathan, Mac Millan.
4. Fundamental of Physics 6th Edition by Halliday, R.Resnick and J.Walker, Wiley NY 2001.
5. The Feynman lectures on Physics Vol.1, 2 & 3 by R.P.Feynman, R.B.Leighton and M.Sands, Narosa Publishers, New Delhi 1998.
6. Seven Wonders of Cosmos by J.Narlikar, Gambridge University Press.
7. After the first three minutes by T.Padmanaban, Gambridge University Press.
8. Statistical Mechanics – Sathya Prakash and C. Agarwal Kedarnath & Ramnath & Co, 7th Edition

LIST OF JOURNALS

1. European Journal of Physics. Vol.27 (2), 2006.
2. World Journal of Condensed Matter Physics, Vol: 08; (02); 2018
3. International Journal of Science, 119,820-822 (1927)
4. International Journal of Science, 164, pages 294–295 (1949)
5. American Journal of Physics 40, 850 (1972);

LIST OF WEBSITES

1. <https://static1.squarespace.com/classical-2>.

2. <https://courses.lumenlearning.com/physics/the-wave-nature-of-matter/>
3. <http://physics.mq.edu.au/WaveMechanicsLecture.pdf>
4. https://phys.libretexts.org/Applications_of_Quantum_Mechanics
5. <http://hyperphysics.phy-astr.gsu.edu/hbase/quantum/disfd.html>

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Familiarize with the principle of virtual work and D'Alembert's, Lagrange's equations and its applications
CO2	Get introduction to the aspect of wave nature of matter and connected experimental study
CO3	Obtain good understanding in the basics of quantum mechanics
CO4	Are able to solve problems using quantum mechanics
CO5	Understand statistical ensembles, statistical distribution of energy and quantum statistics

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	2
CO2	2	3	2	2	2
CO3	3	2	2	2	2
CO4	3	2	3	3	3
CO5	3	2	2	2	2
AVERAGE	2.8	2.2	2.2	2.2	2.2

SEMESTER – VI
PAPER- 15 : SOLID STATE PHYSICS

TOTAL HOURS: 6

COURSE CODE : 172215

CREDITS: 4

COURSE OBJECTIVES:

1. To delve deep into the crystal structure and defects associated with it.
2. To introduce the properties of magnetic and dielectric materials
3. To equip the students to create more new materials to suit applications.

UNIT - I : CRYSTAL STRUCTURE

Distinction between crystalline and amorphous solids – Different features of crystal - Crystal lattice – primitive and unit cell – seven class of crystals – Bravais lattice – Miller indices, structure of crystals – Atomic packing factor – coordination number – simple cubic crystal – Hexagonal close packed structure – face centered and body centered cubic structure – structure of sodium chloride – zinc blende and diamond.

UNIT - II : BONDS IN CRYSTALS AND SUPERCONDUCTIVITY

Interatomic forces – Different types of chemical bonds – Ionic bond, covalent bond, metallic bond, Vanderwaal's bond and Hydrogen bond – Superconductivity – Magnetic properties – Isotopic effect, Thermodynamic effect, Meissner effect – BCS theory – Type I and Type II superconductors – Application of superconductors.

UNIT - III : DEFECTS IN SOLIDS

Crystal imperfections – point defects – line defects – Edge dislocation and Screw dislocation – surface defects- Grain boundaries – Twin boundaries – Twist boundaries – Stacking fault - volume defects – effects of crystal imperfection on properties of materials.

UNIT - IV : MAGNETIC MATERIALS

Different types of magnetic materials – Langevin's classical theory of Diamagnetism and paramagnetism Weiss theory of paramagnetism – Qualitative explanation of Heisenberg internal field and Quantum theory of Ferromagnetism.

UNIT- V : DIELECTRIC MATERIALS

Fundamental definitions in Dielectrics – Different types of electric polarization – Frequency and temperature effects on polarization – Dielectric loss – internal field – Clausius – Mosotti relation - Determination of Dielectric constant – Dielectric breakdown – properties of different types of insulating materials.

BOOKS FOR STUDY

1. Solid State Physics by C. Kittel
2. Solid State Physics by P.K. Palanisamy – Scitech Publication, (India) Pvt. Ltd.
3. Material Science by M. Arumugam, Anuradha Publishers.
4. Atomic Physics by J.B. Rajam, S. Chand & Co.

BOOKS FOR REFERENCE

1. Introduction to Solids by Azaroff, Tata McGraw Hill.
2. Modern Physics by R. Murugesan, S. Chand & Co.
3. Solid State Physics by J. Dekker Macmilan India Ltd.
4. Electricity & Magnetism by R. Murugesan, S. Chand & Co, 3rd Edition.
5. Material Science by P.K. Palanisamy, Scitech Publication, (India) Pvt. Ltd.

LIST OF JOURNALS

1. Journal of applied crystallography, [Volume 36, Issue 5](#), 2003, Pages 1270-1271
2. J. Chem. Educ. 1987, 64, 11, 934.
3. [Journal of Physics C: Solid State Physics, Volume 19, Number 23](#)
4. Acta Phys. sin. 1963, Vol. 19 » Issue (9): 541-559.
5. [IEEE Transactions on Microwave Theory and Techniques](#), Vol. 50, (3) 2002.

LIST OF WEBSITES

1. <https://vlab.amrita.edu>
2. <https://www.thoughtco.com/superconductor>
3. https://www.substech.com/imperfections_of_crystal_structure
4. <https://electronicspani.com/types-of-magnetic-materials/>
5. <https://www.electrical4u.com/dielectric-materials/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Gain a complete overall picture of crystal structure
CO2	Gain knowledge of the various bonds in crystals and in superconductors
CO3	Tries to identify the defects in crystals and their influence on the properties of matter

CO4	Gains knowledge in different type of magnetic materials and their behaviour
CO5	Understands the fundamentals of dielectrics and its applications

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	3	3
CO2	3	2	3	3	3
CO3	3	2	3	3	3
CO4	3	2	3	3	3
CO5	3	2	3	3	3
AVERAGE	3	2	2.8	3	3

SEMESTER -VI

PAPER – 16: CORE PRACTICAL - 3

(At the end of VI - Semester)

TOTAL HOURS: 6

COURSE CODE : 172216

CREDITS: 4

COURSE OBJECTIVES:

1. To correlate theoretical knowledge with practical.
2. To perform the related experiments towards data acquisition with the laboratory equipments.
3. Develop honesty in reporting the work.

EXPERIMENTS

1. Compound Pendulum
2. Young's modulus - Koenig's method-- non uniform bending.
3. Biflar pendulum — Parallel threads
4. Newton's rings – R_1 , R_2 and n of a convex lens.
5. Spectrometer — $i - i^1$ curve
6. Spectrometer - Dispersive power of a prism.
7. Spectrometer - Narrow angled prism.
8. Filed along the axis of a circular coil - Deflection Magnetometer - B_H
9. EMF of thermocouple - Mirror galvanometer
10. EMF of thermocouple - Potentiometer
11. Potentiometer - Calibration of High Range voltmeter
12. Carey Foster Bridge — Temperature co-efficient of resistance
13. B.G - Charge Sensitiveness
14. B.G — Comparison of EMFs.
15. B.G - Comparison, of capacitances
16. B.G - Absolute capacitance

17. B.G - Comparison of Mutual Inductances

18. B.G- Absolute mutual Inductance

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Understand the underlying principle behind the working of pendulums.
CO2	Are endowed with knowledge of effective usage of spectrometers to determine prism constants.
CO3	Learn to determine thermo- emf by potentiometer and mirror galvanometer.
CO4	Have a knowledge on the working of a good number of equipments.
CO5	Learn to operate the Ballistic galvanometer for various application

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

SEMESTER - VI

ELECTIVE PAPER – II

PAPER 17 : INTEGRATED ELECTRONICS AND MICROPROCESSOR

TOTAL HOURS: 5

COURSE CODE : 172217

CREDITS: 5

COURSE OBJECTIVES:

1. To gain knowledge in the usage of various semiconductor devices
2. Application of OPAMP, logic gates designing flip-flops and counters
3. Basic architecture and programming of microprocessor 8085

UNIT – I : SPECIAL SEMICONDUCTOR DEVICES

Field effect transistor (FET) –Characteristics – FET amplifier – Uni-Junction Transistor (UJT) – Characteristics –Saw-toothed generator - VVR Action – Relaxation oscillator – Frequency of oscillation – Silicon controlled Transistor (SCR) – Characteristics – SCR as a Switch – SCR Rectifier.

UNIT -II : OPERATIONAL AMPLIFIER

OPAMP -Characteristics parameters – Differential gain – CMRR – Slew rate – Band width – Applications – inverter, non-inverter, integrator, differentiator, summing, difference and averaging amplifier, solving simultaneous equation.

UNIT - III : COMBINATIONAL LOGIC CIRCUITS

Logic Gates - OR, AND, NOT, EX - OR, NAND and NOR gates - NAND and NOR as universal gates - De Morgan's Theorems -simplification of Boolean expression - Arithmetic circuits - Half adder, Full adder - Half subtractor, Full subtractor - Parallel binary adder. Simplification of logic circuits - sum of products - Karnaugh map - pair, Quad, Octet - Don't cares – SOP forms of expressions (minterms).

UNIT - IV : SEQUENTIAL LOGIC CIRCUITS

R.S Flip - flop - clocked R S. Flip-flop D-Flip-flop - J.K. Flip - flop - J.K. Master slave Flip – flop - T-Flip-flop.

Counters - Asynchronous counters - Binary ripple counter - BCD decade counters – 555 timer - Internal Block diagram and working - Astable and monostable operations.

Unit - V Microprocessors

Evolution of microprocessor - Organisation of a micro computer - Bus structure -architecture of 8085 microprocessor - programming a microprocessor - basic concepts -machine language - Assembly language - instruction and data formats - classification of instructions - 8085 instruction set -

Addressing methods - simple assembly language programs - Addition and subtraction of two numbers
- Multiplication by repeated addition -square root of a number.

BOOK FOR STUDY

1. Elements of Electronics by Bagde and Singh, S. Chand & Co.
2. Digital Principles and Applications by Malvino and Leach, Tata McGraw Hill.
3. Integrated Electronics by Millman and Halkias, McGraw Hill.
4. Microprocessor architecture Programming and Application with 8085/8080 A by Ramesh Gaonkar, Wiley Eastern.
5. Microprocessor and interfacing by Douglas V Hall, Tata McGraw Hill.
6. Fundamentals of Micro Procesor 8085 by V. Vijayendran, S. Viswanathan Publishers, Chennai.

BOOKS FOR REFERENCE

1. Computer Architecture and Logic Design by T.C. Bartee, McGraw Hill, 1991.
2. Electronic Devises and Circuits by Allen Mottershed, Prentice Hall.
3. Digital Integrated Electronics by Herbert, Taub and Donald, Schilling, McGraw Hill.
4. Introduction to Microprocessor by Aditya Mathur, Tata McGraw Hill.

LIST OF JOURNALS

1. American Journal of Engineering Research (AJER), Volume-4, Issue-10, pp-86-91
2. International Journal of Recent Engineering Research and Development (IJRERD), Volume 03 – Issue 08 || August 2018 || PP. 63-70
3. International Research Journal of Engineering and Technology (IRJET), Vol: 3(7) 2016.
4. IOSR Journal of Electronics and Communication Engineering (IOSR-JECE), Volume 10, Issue 6, Ver. II (Nov - Dec .2015), PP 09-14

LIST OF WEBSITES

1. <https://www.electronics/power/unijunction-transistor.html>
2. <https://www.elprocus.com/operational-amplifiers/>
3. https://www.tutorialspoint.com/computer_logical_organization/logic_gates.htm
4. https://www.electronics-tutorials.ws/sequential/seq_2.html
5. <https://www.javatpoint.com/microprocessor-introduction>

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Appreciate the use of FET,UJT and SCR
CO2	Understand the basic of OPAMP
CO3	Understand the basic logic gate and theorems of Boolean algebra
CO4	Able to build flip-flops and counters using universal building blocks
CO5	Llearn basic structure of 8085 and apply them to write simple programs in assembly language

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

SEMESTER – VI**ELECTIVE PAPER – III**

PAPER 18 : CORE PRACTICAL – 4

(At the end of VI - Semester)

TOTAL HOURS: 6

COURSE CODE : 172218

CREDITS: 5

COURSE OBJECTIVES:

1. To conclusively verify the student's understanding in a practical setup.
2. Equip the student with practical knowledge of electronics for the industry.
3. For better understanding of OPAMP, FET, oscillators, amplifiers, multivibrators and gates.

EXPERIMENTS

1. AND, OR, NOT gates using diodes and transistors
2. FET - Characteristics
3. FET-Amplifier.
4. UJT - Characteristics
5. UJT - Relaxation oscillator
6. NAND and NOR - as universal gate
7. Verification of De-Morgan's Theorems
8. Half adder and full adder.
9. Half subtracter and full subtracter.
10. 4 - bit ripple counter using 7473 / 7476
11. Decade counter using 7490.
12. OPAMP - Inverting amplifier, non - inverting amplifier and unity follower
13. OPAMP - summing amplifier and difference amplifier
14. OPAMP - Differentiator and Integrator
15. 555 — Timer — Astable operation.
16. -do- Monostable Operation.
17. Astable multivibrator - Transistor.
18. Single stage amplifier.
19. Hartley oscillator
20. Colpits oscillator
21. Full wave rectifier using two diodes

22. Voltage regulator using 1C, Zener diode
23. Bridge rectifier
24. Micro processor - addition and subtraction
25. Micro processor- multiplication and square root

BOOKS FOR STUDY AND REFERENCE:

1. A Laboratory manual of Physics for UG Courses by B.P.Khandalwal.
2. Advanced practical physics by Worsnop and Flint.
3. A Text book of practical physics by M.N.Srinivasan, S.Chand & Co.
4. Practical physics by M.Arul Thalapathi, Comptek Publishers
5. Practical physics (Electronics and Micro processor) by M.Arul Thalapathi, Comptek Publishers

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Have a better understanding of the working of FET and UJT.
CO2	Are confident of OPAMP and 555 circuits
CO3	Apply the knowledge gained for constructing and operating Regulators.
CO4	Have a practical insight on the working of amplifiers and oscillators.
CO5	Appreciate the functioning of Microprocessors.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

ALLIED PHYSICS : PAPER -1

TOTAL HOURS: 3

COURSE CODE : 172291

CREDITS: 5

COURSE OBJECTIVES:

1. To achieve a basic knowledge of properties of matter
2. To get an insight into Acoustics and Thermal Physics
3. To understand the nature of electricity and magnetism

UNIT – I : SIMPLE HARMONIC MOTION AND CIRCULAR MOTION

Composition of two simple harmonic motions along a line and at right angles - Lissajous figures and uses.

Uniform circular motion - Acceleration of a particle in a circular path - centripetal and centrifugal forces - centrifuge - Banking on curved tracks.

UNIT -II : ELASTICITY

Elastic constants - Bending of beams - young's modulus by non uniform bending - energy stored in a stretched wire. Torsion in a wire - determination of rigidity modulus by torsional pendulum – static Torsion

UNIT - III : VISCOSITY AND SURFACE TENSION

Viscosity: Coefficient of viscosity - Poiseuille's formula {dimension method} - comparison of viscosities using burette - stoke's law - Terminal velocity - viscosity of highly viscous liquids - lubrication

Surface Tension: Molecular theory of surface tension - excess of pressure inside a drop and bubble - surface tension by drop weight method - interfacial surface tension.

UNIT - IV : THERMAL PHYSICS AND SOUND

Thermal Physics: Vanderwaal's equation of state - Derivation of critical constants

Sound: Transverse vibration of stretched string - expression for the velocity of transverse waves.

Laws of Transverse vibration - AC frequency measurement using sonometer.

UNIT - V : ELECTRICITY AND MAGNETISM

Capacitor - energy of a charged capacitor - loss of energy due to sharing of charges. Potentiometer - measurement of internal resistance of a cell and voltmeter calibration. Protective device - Fuse.

Magnetic Field due to a current carrying conductor - Biot - Savart's law - field along the axis of a coil.

BOOKS FOR STUDY AND REFERENCE

1. Allied physics by K.Thangaraj & D.Jayaraman - Popular Book Depot Chennai.
2. Allied physics by R.Murugesan, S.Chand & Co.
3. Heat and Thermodynamics by J.B.Rajam, S.Chand & Co .
4. Elements of properties of matter by Brij Lal and Subramanian, Eurasia Publishing Co. NewDelhi.
5. Electricity and Magnetism by Narayanamurthy and Nagaratinam –National publishing Co.

LIST OF JOURNALS

1. Journal of Elasticity (International)
2. International Journal of Fluid Mechanics and Thermal Physics
3. Applied Acoustics Journal of Vibration and Acoustics (International)
4. [European Journal of Physics](#), [Volume 19](#), [Number 2](#)

LIST OF WEBSITES

1. <https://www.khanacademy.org/introduction-to-simple-harmonic-motion>
2. http://Fariside.ph.utexas.edu/teaching/301/lectures/node_139.html
3. <http://www.dataphysics.de/2/start/understanding-interfaces/baiscs/>
4. https://www.techglads.com/cse/sems/production_of_ultrasonics-by-piezoelectric-methods/
5. <https://www.electrical4u.com/biot-savart-law/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Gain knowledge about uniform motion and its application in day to day life
CO2	Study the nature of elasticity
CO3	Acquire a better insight into the nature of liquids – Viscosity and Surface Tension
CO4	Gain knowledge about Vanderwaals equation and sound
CO5	Study the interrelationship between electricity and magnetism and certain devices

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	2
CO2	3	3	3	3	3
CO3	3	2	2	2	2
CO4	3	1	2	2	2
CO5	3	3	3	3	3

AVERAGE	3	2.2	2.6	2.6	2.4

ALLIED PHYSICS : PAPER – 2

TOTAL HOURS: 3

COURSE CODE : 172292

CREDITS: 3

COURSE OBJECTIVES:

1. To appreciate the nature of light
2. To study the atomic and nuclear models
3. To gain knowledge on the concept of Relativity, Wave Mechanics and Basic Electronics

UNIT – I : GEOMETRICAL OPTICS

Refraction through a thin prism and dispersive power - combination of two prisms to produce dispersion without deviation and deviation without dispersion. Velocity of Light - Michelson's method.

UNIT - II : PHYSICAL OPTICS

Interference in thin films - interference in wedge shaped film - Newton's rings - measurement of wavelength and radius of curvature with theory.

Diffraction - theory of transmission grating - normal incidence - Polarization - Double refraction-Nicol Prism - Optical activity.

UNITY - III : ATOMIC AND NUCLEAR PHYSICS

Atom model - vector Atom Model - electron, spin, quantum numbers - Excitation and ionization potentials - experimental determination - Frank and Hertz method.

Nuclear model - liquid drop model - nuclear energy - mass defect, Binding energy - fission and fusion - atom bomb - Nuclear reactor - thermo nuclear reactions - stellar energy.

UNIT - IV : RELATIVITY AND WAVE MECHANICS

Postulates of theory of relativity - Lorentz transformation equations - derivation - length contraction and time dilation. Dual nature of matter De-Broglie theory - Davisson and Germer experiment - wave mechanical model of atom {qualitative study}.

UNIT - V : ELECTRONICS

Basic electronics : Junction diode - LED - Zener diode as voltage regulator. Transistor - characteristics - common base and common emitter mode.

Digital electronics : Basic logic gates - AND, OR , NOT - operations and truth tables. NAND and NOR gates-Universal building blocks - De Morgans's theorems - verification. Elementary ideas of ICs - Classification, advantages and limitations.

BOOKS FOR STUDY AND REFERENCE

1. Allied physics by K.Thangaraj & D.Jayaraman - Popular Book Depot Chennai.
2. Allied physics by R.Murugesan S.Chand & Co.
3. A text book of optics by Brijlal and Subramanian - S.Chand & Co.
4. Modern Physics by R. Murugesan S.Chand & Co.
5. Digital principles and application - Malvino & Leach., Tata McGraw Hill
6. Concepts of modern physics by Arthur Beiser , Tata McGraw Hill

LIST OF JOURNALS

1. **Journal of the Optical Society of America A**, Vol. 13, Issue 12, pp. 2341-2347 (1996)
2. [Physics Education](#), Volume 7, Number 7(2013)
3. J. Chem. Educ.1948,25,5,260
4. American Journal of Physics 20, 161 (1952)
5. [Transactions of the IRE Professional Group on Electron Devices](#), Vol:2,(2) 1953

LIST OF WEBSITES

1. <https://www.physics.com/Dispersion-of-Light-by-Prisms>
2. <https://www.britannica.com/science/double-refraction>
3. <https://www.siyavula.com/the-atom/04-the-atom-02>.
4. <https://www.space.com/36273-theory-special-relativity.html>
5. https://www.electronics-tutorials.ws/diode/diode_7.html

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Study geometrical optics with regard to prisms
CO2	Appreciate the phenomenon of light- interference, diffraction and polarisation
CO3	Understand the development of various atomic and nuclear models and gain knowledge of nuclear reactions- nuclear fission and fusion
CO4	Understand the basic principles of relativity and wave mechanics
CO5	Understand the working of few active devices – diodes and transistors . Introduce to digital electronics

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	2	2
CO2	3	3	3	2	3
CO3	3	2	2	2	2
CO4	3	1	2	2	2
CO5	3	3	3	3	3
AVERAGE	3	2.2	2.6	2.2	2.4

ALLIED PHYSICS - PRACTICAL

(At the end of even semester)

TOTAL HOURS: 3

COURSE CODE : 172293

CREDITS: 2

COURSE OBJECTIVES:

1. To develop practical skill.
2. Analyse and interpret the measurements taken for valid conclusion.
3. Gain a better understanding of Physics through experimental work.

EXPERIMENTS:

1. Young's modulus by non uniform bending using Pin and microscope
2. Young's modulus by non uniform bending using Optic lever - Scale and telescope
3. Rigidity modulus by Static torsion method.
4. Rigidity modulus by torsional oscillations.
5. Surface tension and interfacial Surface tension - drop weight method.
6. Comparison of viscosities of two liquids - Burette method.
7. Sonometer-A.C. Frequency.
8. Newton's rings - Radius of curvature.
9. Air wedge - thickness of a wire.
10. Spectrometer - grating - wavelength of Hg lines (N.Given)
11. Potentiometer - voltmeter calibration.
12. Zener Diode – characteristics.
13. NAND gate as a universal gate
14. Transistor characteristics (CB mode)

Note : Use of digital balance permitted

BOOK FOR STUDY AND REFERENCE

1. Allied Practical Physics by M.N. Srinivasan, S.Chand and Co.
2. Allied Practical Physics by M. Arul Thalapathy, Comptek Publishers.
3. Allied Practical Physics by D. Jayaraman.

COURSE OUTCOMES:

CO Number	CO STATEMENT
After completion of the course the students	
CO1	Understand the response of materials to various conditions
CO2	Apply the theory of interference for application
CO3	Calibrate meters using potentiometer
CO4	Learn to effectively use the spectrometer for experimental work.
CO5	Appreciate the use of diodes and transistors.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	3
CO2	3	3	3	3	3
CO3	2	3	2	3	3
CO4	3	3	3	3	3
CO5	3	3	2	3	3
AVERAGE	2.8	3	2.4	3	3

**QUAID-E-MILLATH GOVERNMENT COLLEGE FOR
WOMEN**

(Autonomous)

**Anna Salai, Chennai – 600 002.
Affiliated to University of Madras**

DEPARTMENT OF CHEMISTRY

M.Sc. CHEMISTRY

SYLLABUS



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

(OFFERED FROM THE ACADEMIC YEAR 2017-18)

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9. Course Profile Semester II
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Programme Outcomes

Programme Specific Outcomes

Programme Profile

Evaluation pattern for CA

Evaluation Pattern for End Semester

Course Profile-Semester I

Course Profile Semester II

Course profile Semester III

Course profile Semester IV

RULES AND REGULATIONS

**QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS) CHENNAI 600 002.**

M.Sc., Chemistry syllabus

Choice Based Credit System

Quaid-E-Millath Government College for Women(autonomous) offers the Semester system of education with credits for PG courses. Credit is related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures/tutorials/laboratory work/seminar/project work/practical training/viva voce etc., to facilitate effective teaching and learning and the credits are assigned accordingly depending on the content and the specialization.

The credit requirement for two year PG course shall be 90 (80 for Core and Elective & 10 credits for Soft skill papers & Internship)

REGULATIONS

1. CONDITIONS FOR ADMISSION

B.Sc., Chemistry with Mathematics/ Physics/ Botany/ Zoology and as one of the ancillary subject.

2. ELIGIBILITY FOR THE AWARD OF DEGREE

A candidate shall be eligible for the award of the degree only if he/she has undergone the prescribed course of study in a college affiliated to the University for a period of not less than two academic years, passed the examination of all the four semesters prescribed earning 90 credits and fulfilled such conditions as have been prescribed therefore.

3. DURATION OF THE COURSE

The duration of the course is for two academic years consisting of four semesters.

4. EXAMINATIONS

There shall be four semester examinations: first semester examinations at the middle of the first academic year and the second semester examination at the end of the first academic year. Similarly, the third and fourth semester examinations shall be held at the middle and the end of the second academic year, respectively.

a) COURSE OF STUDY AND SCHEME OF EXAMINATIONS

Course of Study

The course of study for post graduate degree course shall comprise of Core courses & Electives

- System of credits

Year	No of Papers			Marks	Credits			
	Core	Elective	Soft Skill		Core	Elective	Soft Skill	Internship
I Year	7	3	2	1200	33	12	2×2=4	2
II Year	8	2	2	1200	37	8	2×2=4	
Total	15	5	4	2400	70	20	8	2

b) DISTRIBUTION OF MARKS FOR CONTINUOUS ASSESSMENT:

(Theory)

Test			Best out of 3	Assignment/seminar/ Creative Presentation/ Assignment on Glossary			Model Exam(75) reduced to	Attendance	Total	Reduced to
1	2	3		1	2	3				
20	20	20	40	10	10	5	25	10	100	25

c) PATTERN OF QUESTION PAPER (MODEL & SEMESTER EXAMINATION)

PART-A (50 words): Answer 10 out of 12 Questions $10 \times 2 = 20$ marks

PART -B(200 words):Answer 5 out of 8 Questions $5 \times 5 = 25$ marks

PART-C(500 words):Answer 3 out of 5 Questions $3 \times 10 = 30$ marks

Total marks: = 75 marks

d) DISTRIBUTION OF MARKS FOR CONTINUOUS ASSESSMENT:

For Practicals

Test (Best out of three)	Model Examination	Record and Observation	Total	Total reduced to

30 marks	20 marks	50 marks	100 marks	25 marks

Project:

Internal Marks (Best 2 out of 3 presentations) and Project Report : 75 Marks

Viva – Voce : 25 Marks

Total : 100 Marks

Break-up Details for Attendance

90% and above : 10 Marks

80% and above : 9 Marks

75% and above : 8 Marks

65% and above : 7 Marks (Eligible to write after paying condonation fee)

50% and above : 5 Marks (Eligible to write examination in the following semester after
Paying condonation fee)

Below 55% : Not eligible (NE)

5. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTERS:

(i) Candidates shall register their names for the First semester examination after the admission in the UG courses.

(ii) Candidates shall be permitted to proceed from the First Semester upto the Final Semester irrespective of their failure in any of the Semester Examination subject to the condition that the candidates should register for all the arrear subjects of earlier semesters along with current (subject) Semester subjects.

(iii) Candidates shall be eligible to proceed to the subsequent semester, only if they earn, sufficient attendance as prescribed therefore by the Syndicate from time to time. Provided in case of candidate earning less than 50% of attendance in any one of the semester due to any extraordinary circumstance such as medical grounds, such candidates who shall produce Medical Certificate issued by the Authorised Medical Attendant (AMA), duly certified by the Principal of the College, shall be permitted to proceed to the next semester and to complete the course of study. Such candidate shall have to repeat the missed semester by rejoining after completion of final semester of the course, after paying the fee for the break of study as prescribed by the University from time to time

6. PASSING MINIMUM:

- There shall be no Passing Minimum for Internal.
- For External Examination, Passing Minimum shall be of 50% (Fifty Percentage) of the maximum marks prescribed for the paper.
- In the aggregate (External + Internal) the passing minimum shall be of 50% for each Paper/Practical.
- Grading shall be based on overall marks obtained (internal + external).

7. GRADING SYSTEM:

The term grading system indicates a Ten (10) Point Scale of evaluation of the performances of students in terms of marks obtained in the Internal and External Examination, grade points and letter grade.

GRADE	GRADE POINT	PERCENTAGE EQUIVALENT
`O' = Outstanding	9.00 – 10.00	90 – 100
`D+' = Excellent	8.00 – 8.90	80 – 89
`D' = Distinction	7.50 – 7.90	75 – 79
`A+' = Very Good	7.00 – 7.40	70 – 74
`A' = Good	6.00 – 6.90	60 – 69
`B' = Average	5.00 – 5.90	50 – 59
`U' = Re appear	4.00 – 4.90	40 – 49

8. OVERALL PERFORMANCE & RANKING:

CGPA	LETTER GRADE	CLASSIFICATION OF FINAL RESULT
9.5-10.0	O+	First Class – Exemplary*
9.0 AND ABOVE BUT BELOW 9.5	O	

8.5 AND ABOVE BUT BELOW 9.0	D++	First Class with Distinction*
8.0 AND ABOVE BUT BELOW 8.5	D+	
7.5 AND ABOVE BUT BELOW 8.0	D	
7.0 AND ABOVE BUT BELOW 7.5	A++	First Class
6.5 AND ABOVE BUT BELOW 7.0	A+	
6.0 AND ABOVE BUT BELOW 6.5	A	
5.5 AND ABOVE BUT BELOW 6.0	B+	Second Class
5.0 AND ABOVE BUT BELOW 5.5	B	

- Applicable to candidates who have passed the courses prescribed for the programme in the first appearance as per the scheme of examination; otherwise they are eligible for classification only.

PROGRAMME OUTCOMES

On completion of the M.Sc., Chemistry programme the learner is able to:

6. Apply computational knowledge
7. Identify quality research
8. Design own curriculum to face competitive world

9. Acquire tremendous subjects knowledge

10. Demonstrate quality skills.

PROGRAMME SPECIFIC OUTCOME (PSOs)-PG

On completion of the specific programme M.Sc., Chemistry

the student will be able to:

1. Acquire a comprehensive understanding of the principles of Chemistry.
2. Develop skills to design and carry out scientific experiments and interpret the data .
3. Appreciate the interdisciplinary nature of Chemistry and become aware of the emerging fields in Chemistry
4. Build a scientific temper and learn the necessary skills to succeed in research and industry.
5. Resolve new problems in Chemistry and participate in the future development of Chemistry

EVALUATION PATTERN FOR CONTINUOUS ASSESSMENT

INTERNAL VALUATION BY COURSE TEACHER/S

CA QUESTION PAPER PATTERN-PG

Knowledge Level	Section	Word Limit	Marks	Total
K1	A-5X2 marks	50	10	25
K2,K 3	B-1/2x5marks	150	5	
K4, K 5	C-1/2x10 marks	300	10	

CA QUESTION PAPER PATTERN FOR PART IV

Knowledge Level	Section	Word Limit	Marks	Total
K 1, K2	A-5X10	350	50	50

PART IV

Distribution of CA Marks:

Seminar / Presentation	Assignment / Term Paper	Written / Oral Test	Total
20	10	10	40

End Semester Examination : Theory Paper = 60 Marks – Duration 2.30 hours.

Question Paper Pattern : 10 x 6 Marks = 60 Marks (10 out of 15)

RUBRICS FOR CONTINUOUS ASSESSMENT

S.No.	Component	Criteria
1	Assignment	Content Originality Presentation Schematic Representation Diagram Bibliography
2	Seminar	Organisation Subject Knowledge Visual Aids Confidence level Presentation Communication Language

3	Field Visit	Participation Preparation Attitude Leadership
4	Participation	Answering Questions Clearing Doubts Participating in Group Discussions Regular Attendance

END SEMESTER EVALUATION PATTERN

THEORY PAPERS

SEMESTER I/II/III/IV

DOUBLE VALUATION BY COURSE TEACHER AND EXTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARKS : 38

PRACTICAL PAPERS

SEMESTER II/IV

VALUATION BY EXTERNAL EXAMINER AND INTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARK : 38

SOFT SKILLS PAPERS

SEMESTER I/II/III/IV

SINGLE VALUATION BY INTERNAL EXAMINER

MAXIMUM MARKS : 60

PASSING MARKS : 30

PROJECT PAPER

SEMESTER IV

DOUBLE VALUATION BY RESEARCH SUPERVISOR AND EXTERNAL EXAMINER

DISSERTATION : 75

VIVA-VOCE:25

MAXIMUM MARKS : 100

PASSING MARKS : 50

INTERNSHIP

YEAR II

SEMESTER IV

MAXIMUM MARKS : 100

PASSING MARKS : 50

PROGRAMME PROFILE

M.Sc., CHEMISTRY

**CHEMISTRY CHOICE BASED CREDIT SYSTEM - SEMESTER WISE PAPER
DETAILS FOR CANDIDATES ADMITTED FROM 2017-2018 ONWARDS**

Sem	Part	Components	Subject Code	Title of paper	Hrs P/W	Total hrs	CA 25	SE 25	Total 100	Credits
I	III	Core Paper I	176301	Inorganic Chemistry I	6	90	25	75	100	4
I		Core Paper II	176002	Organic Chemistry I	6	90	25	75	100	4
I		Core Paper VI		Practicals- I Inorganic chemistry - I	4	-	-	-	-	-
I		Core Paper VII		Practicals- II Organic chemistry	4	-	-	-	-	-
I		Elective (major) I	176303	Physical Chemistry I	5	75	25	75	100	4
I		Elective (major) II	176304	Molecular Spectroscopy & Analytical Chemistry I	5	75	25	75	100	4

I	IV	Soft Skill I	175001	English and Attitudinal Skills for Communication	-		40	60	100	2
II		Core Paper III	176305	Organic Chemistry II	5	75	25	75	100	4
II		Core Paper IV	176306	Physical Chemistry II	5	75	25	75	100	4
II	III	Core Paper V	176307	Molecular Spectroscopy & Analytical Chemistry II	5	75	25	75	100	4
II		Core Paper VI	176308	Practicals – I Inorganic chemistry- I	4		25	75	100	4
II		Core Paper VII	176309	Practicals-II Organic chemistry	4		25	75	100	4
II		Elective III (NME 1)	176310	Nano Science and Technology	4	60	25	75	100	4
		Extra Disciplinary Elective 1	176311	Novel Chemistry	3	45	25	75	100	3
II	IV	Soft Skill II	175002	LSRW Skills for effective Communication	-	-	-	40	60	2
		Internship			-		-	-	-	-
III	III	Core Paper VIII	176312	Inorganic Chemistry II	6		25	75	100	4
III		Core Paper IX	176313	Organic Chemistry III	6		25	75	100	4
III		Core Paper X	176314	Physical Chemistry III	6		25	75	100	4
III		Core Paper XIII		Practicals III Physical chemistry	3		-	-	-	-

Number of units in the syllabus of core papers

05

III	III	Core Paper XIV		Practicals – IV Inorganic chemistry II	3		-	-	-	-
III		Elective IV (NME 11)	17631	Environmental Chemistry	4	60	25	75	100	4
		Extra disciplinary elective 11	176316	Industrial Chemistry	3	45	25	75	100	3
III		Core XV	-	Individual project	2		-	-	-	-
III	IV	Soft Skill III	175003	Life coping skills for success	-		40	60	100	2
IV	IV	Core Paper XI	176317	Inorganic Chemistry III	6	90	25	75	100	4
IV		Core Paper XII	176318	Selected topics in Chemistry	6	90	25	75	100	4
IV		Core Paper XIII	176319	Practicals –III Physical chemistry	3		25	75	100	4
IV		Core Paper XIV	176320	Practicals – IV Inorganic chemistry- II	3		25	75	100	4
IV		Core Paper XV	176321	Individual Project Work	5		75	25	100	4
IV		Elective V (major) III	176322	Green Chemistry	5	75	25	75	100	4
IV	IV	Soft Skill IV	175004	Career oriented skills	1		40	60	100	2
IV		Internship			-		-	-	-	2
				Total						90

Number of units in the syllabus of elective papers

05

Maximum marks per paper

100

Internal Assessment

25

External Assessment

75

S.No	List of Electives
1	Physical Chemistry -I
2	Molecular Spectroscopy & Analytical Chemistry -I
3	Nano Science and Technology
4	Environmental Chemistry
5	Green Chemistry

M.Sc., DEGREE COURSE
CHEMISTRY
SYLLABUS - 2017-2018 ONWARDS
SEMESTER I
CORE PAPER I
INORGANIC CHEMISTRY

Total Hrs:75

Course Code:176301

No. of Credits : 4

COURSE OBJECTIVES:

- To know the different kinds of compounds of the main group elements.
- To know the structure and bonding in inorganic chains, rings, and cages.
- To know the nature of metal-ligand bonding in coordination compounds.
- To learn the determination of stability constants by different methods.
- To understand the atomic states and term symbols.

COURSE OUTLINE

UNIT- I Structure and bonding I

15hrs

Ionic bond- lattice energy-Radius ratio-Limiting radius ratio for trigonal, tetrahedral, octahedral and cubic sites - applications of radius ratio rule-calculation of lattice energies of ionic crystals-Born equation - Born Haber Cycle - symmetry in crystals-miller indices-close packing -crystal types - AX, AX₂.

UNIT -II Structure and bonding II

15hrs

Molecular Orbital theory - LCAO method – Energy level diagram for MO and MO diagrams of simple molecules, CO, HF, CO₂, NH₃, O₂²⁻, O₂²⁺, NO₂⁻ ion.

Wave mechanical treatment of covalent bond-formation of hydrogen molecule- Linnet's Double quartet approach- Some special characteristics of p-block elements-Ionization Energy - Electron Affinity - Reluctance of heavier p-block elements- to show maximum oxidation state, to involve p orbitals for pi bonding- participation of d orbitals in sigma bonding -

electronegativity. Hard-Soft acid base concept - Pearson concept - Applications of HSAB principle.

UNIT -III Theories of coordination

15hrs

Crystal field theory and its limitations, d-orbital splittings, CFSE, concept of weak and strong fields, spectrochemical series, evidences for metal ligand orbital overlap, nephelauxetic effect, Jahn-Teller distortion, charge-transfer spectra. Molecular orbital theory- sigma and pi bonding in octahedral, square planar and tetrahedral complexes.

UNIT- IV Stability of coordination complexes

15hrs

Stability of complexes: Thermodynamic and kinetic stability – stepwise and overall stability constants, their relationships, factors affecting the stability of the complexes, HSAB approach, chelate effect, Chelating agents, importance of chelates. Macrocyclic ligands; types; schiff bases; crown ethers; cryptands.

Determination of stability constants by polarographic, potentiometric method and Job's method.

UNIT- V - Stereo isomerism of coordination compounds

15hrs

Atomic States and term symbols

Stereochemical aspects; Stereoisomerism in coordination complexes; isomerism arising out of ligand and ligand conformation; chirality and nomenclature of chiral complexes; optical rotatory dispersion and circular dichroism. Determination of absolute configuration using ORD.

RECOMMENDED TEXT BOOKS:

6. J.E. Huheey, 1993, Inorganic Chemistry - Principles, Structure and Reactivity; IV Edition, Harper Collins, NY.
7. F.A. Cotton and G. Wilkinson, 1988, Advanced Inorganic Chemistry - A Comprehensive Text, V. Edition, John Wiley & Sons.
8. K.F. Purcell and J.C. Kotz, 1977, Inorganic Chemistry - WB Saunders Co., USA.
9. M.C.Day and J. Selbin, 1974, Theoretical Inorganic Chemistry, Van Nostrand Co., NY.
10. U.Malik, G.D.Tuli and R.D. Madan 1992 Selected Topics in Inorganic chemistry

11. REFERENCE BOOKS:

1. D.F. Shriver, P.W. Atkins and C.H. Langford 1990, Inorganic Chemistry
2. N.N. Greenwood and Earnshaw, 1984, Chemistry of the Elements, Pergamon Press,

3. S.F.A. Kettle, 1973, Coordination Chemistry, ELBS.
4. Puri, Sharma, Kalia, Principles of Inorganic chemistry .
5. B. Douglas, D. McDaniel, J. Alexander, Concepts of models of Inorganic chemistry 3rd Edn, John Wiley 2001.
6. J.D. Lee, A New Concise of Inorganic chemistry 3rd Edn, ELBS 1987.

JOURNALS:

1. ACS Journal of Chemical Education. 2001, 78, 12, 1600 December 1, 2001
<https://doi.org/10.1021/ed078p1600.2>
2. Journal of the Chemical Society, Dalton Transactions, 2002, Issue 24, Page 4527 to 4754

E-LEARNING RESOURCES:

1. <http://info.dome.sdsu.edu/research/guides/science/inorgchemistryblr.html>
2. <http://www.liv.ac.uk/chemistry/links/reactions.html>
3. <http://inorgchem.chem.uconn.edu/namereact/named.html>
4. www.gcocities.com/chempensoftware/reactions.html
5. [https://doi.org/10.1016/S0040-4020\(01\)83253-1](https://doi.org/10.1016/S0040-4020(01)83253-1)

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO1	To demonstrate the crystal types of AX and AX ₂
CO2	To discuss about the some special characteristics of p-block elements
CO3	To explain clearly about the different coordination compounds, their structure, bonding in simple and polymeric inorganic chains
CO4	To Create a thorough knowledge of different kinds of bonding in metal and ligand complexes and also updated its applications in research field
CO5	To compute the ORD and CD

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	1	2	3
CO2	2	3	2	3	2
CO3	2	2	3	3	2
CO4	2	2	3	3	2

CO5	3	3	3	3	2
AVERAGE	2.4	2.6	2.4	2.8	2.4

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER I
CORE PAPER II
ORGANIC CHEMISTRY I

Total Hrs:75

Course Code:176302

No. of Credits : 4

COURSE OBJECTIVES:

- To understand the concepts of aromaticity.
- To gain the knowledge of organic reaction intermediates.
- To learn and appreciate the concepts of stereochemistry
- To analyse different conformers and the reactions
- To understand the mechanism of nucleophilic substitution and electrophilic substitution reactions.

COURSE OUTLINE

UNIT- I : Aromaticity

15hrs

Aromaticity-Differentiating aromaticity and antiaromaticity using NMR technique-Huckel's theory of aromaticity-Discussion of aromaticity in benzenoid compounds, heterocyclic compounds such as pyridine, thiophene, furan, cyclopentadienide ion, pyridinium ions, tropylium ion, tropones, ferrocene, annulenes having $(4n+2)\pi$ electrons, fullerenes and aromatic compounds in biochemistry. Antiaromaticity - typical examples of $4n\pi$ electrons.

UNIT-II Determination of mechanism and Photochemistry

15hrs

Thermodynamic and kinetic requirements for a reaction-kinetic and thermodynamic control - Hammond's postulate-energy profile diagrams-microscopic reversibility

Non-kinetic methods- identification of products and intermediates, isotopic labeling, stereochemical evidences, isotopic effects, cross-over experiments, trapping of intermediates, Hammett Taft equation.

Photochemistry of Ketones-Norrish I and Norrish II type reactions, Photoreduction, Photochemistry of Olefins-Cis, trans isomerisations, Photocyclo addition, Paterno Buchi Reaction, Photo rearrangements-di-pi methane rearrangements, Barton reaction.

UNIT-III: Stereochemistry

15hrs

Optical activity and chirality, Classification of chiral molecules as asymmetric and dissymmetric. A brief study of dissymmetry of allenes, biphenyls, spiro compounds, paracyclophanes and helicenes – Homotopic enantiotopic and diastereotopic-Absolute configuration-DL and RS notation of acyclic chiral molecules, allenes, biphenyls and spiro

compounds, molecules with more than one asymmetric centre-erythro threo, meso dl configuration, prochiral centre- Asymmetric synthesis. Cram's rule.

Geometrical isomerism, E, Z - nomenclature of olefins, Geometrical and optical isomerism (if shown) of disubstituted cyclopropane, cyclobutane and cyclopentanes. Stereospecific and stereoselective reactions.

UNIT-IV: Conformational Analysis

15hrs

Conformation of some simple 1,2-disubstituted ethane derivatives. Conformational analysis of disubstituted cyclohexane and their stereo chemical features (geometric and optical isomerism (if shown) by these derivatives). Conformation and reactivity of substituted cyclohexanol (oxidation and acylation), cyclohexanone (reduction) and cyclohexane carboxylic acid derivatives (esterification and hydrolysis). Conformational analysis of cis and trans decalin, 9-methyldecalin and bridged norborane type ring systems. Curtin Hammett equation.

UNIT-V: Nucleophilic substitution

15hrs

Aliphatic Nucleophilic Substitution: SN^1 , SN^2 and SN_i mechanisms - Neighboring group participation by π and sigma bonds- reactivity, structural and solvent effects – Brief study on substitution in norbornyl and bridgehead systems, substitution at allylic and vinylic carbons - substitution by ambident nucleophiles-CN, NO_2 , Phenoxide – hydrolysis of esters- alkylation and acylation of amines, Von Braun reaction.

Aromatic Nucleophilic substitution: Benzyne mechanism-methods for generation of benzyne intermediates, nucleophilic substitution involving diazonium ions, Ziegler Alkylation, Chichibabin reaction.

RECOMMENDED TEXTBOOKS:

1. Organic reaction mechanisms-P.S.Kalsi.
2. Reaction Mechanisms in Organic Chemistry-V.K.Ahluwalia
3. Principles of Reaction mechanism in Organic Chemistry-Parmer and Chawla
4. Organic Chemistry-Jain and Sharma
5. Stereochemistry of organic compounds, Principles and applications, D. Nasipuri.

REFERENCE BOOKS:

1. Stereochemistry, Conformation analysis and Mechanism by P.S. Kalsi, 2nd Edition (1993), Wiley Eastern Limited, Chennai.
2. Stereochemistry of carbon compounds by Ernest Eliel
3. Organic Chemistry, Morrison and Boyd, Prentice – Hall of India Pvt. Ltd.
4. J. March, Advanced Organic Chemistry, Wiley Interscience, 2007.
5. I. L. Finar, Organic Chemistry Vol-2, 5th edn, Pearson Education Asia, 1975.
6. I. L. Finar, Organic Chemistry Vol-1, 6th edn, Pearson Education Asia, 2004.

- Organic reaction mechanism, 3rd Edition, V. K. Ahluwalia, Rakesh Kumar, Parashar.
- F. A. Carey and R. J. Sundberg, Advanced Organic Chemistry, Part A and B, 4th edn, Kluwer Academic/Plenum Publishers, 2000.
- S. H. Pine, Organic Chemistry, 5th edn, McGraw Hill International Edn, 1987.
- Organic Reaction Mechanism by R.K. Bansal.
- Organic Synthesis by R.O.C. Norman, Chapman and Hall, NY, (1980)
- Organic Chemistry by Solomons & Fryhle 8th edition.
- Molecular Reaction and Photochemistry by Charles H. Depuy and Orville, L. Chapman, Prentice Hall of India Pvt., Ltd., New Delhi.

JOURNALS:

- [Journal of Organic Chemistry](#)
- [International journal of Organic Chemistry](#)
- [Asian Journal of Organic Chemistry](#)
- [Organic Chemistry international](#)
- [Indian journal of Chemistry](#)

E-LEARNING RESOURCES:

UNI T	E links
1	https://www.masterorganicchemistry.com/2017/02/23/rules-for-aromaticity/
2	https://www.khanacademy.org/science/chemistry/chem-kinetics/arrhenius-equation/a/reaction-mechanisms
3	https://en.wikibooks.org/wiki/Structural_Biochemistry/Organic_Chemistry/Stereochemistry
4	http://www.chem.ucalgary.ca/courses/351/Carey5th/Ch03/ch3-0.html
5	https://www.organic-chemistry.org/namedreactions/nucleophilic-substitution-sn1-sn2.shtm

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Identified different Aromatic compounds
CO 2	Understood the basics behind reaction mechanism
CO 3	Analysed the Stereochemistry of Organic compounds
CO 4	Elucidated the conformational analysis
CO 5	Thorough understanding of nucleophilic substitution

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	1	3
CO2	1	3	1	3	2
CO3	2	2	3	1	3
CO4	3	3	3	3	2
CO5	3	3	2	3	3
AVERAGE	2.4	2.6	2.4	2.2	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER I**ELECTIVE MAJOR I****PHYSICAL CHEMISTRY I****Total Hrs:75****Course Code:176303****No. of Credits : 3****COURSE OBJECTIVES:**

- To learn the concepts of partial molar properties and collision theory of reaction rates and reaction in solution.
- To learn the concepts of activity and activity co-efficient.
- To study about collision theory of reaction rate, kinetics of complex reactions and enzyme catalysis.
- To learn the basic concepts of reactions in solution, Langmuir and BET adsorption isotherm.
- To learn concepts of group theory and its applications in spectroscopy.

COURSE OUTLINE:**UNIT-I: Thermodynamics I****15hrs**

Fundamental system of open system, partial molar quantities and chemical potential, Partial molar free energy (Chemical potential)- Partial molar volume and Partial molar heat content.

Gibbs – Duhem equation, Mixture of gases, alternative definition of chemical potential – Variation of chemical potential with pressure and temperature. Chemical potential and phase equilibrium. Clausius-clapeyron equation.

The principle of microscopic reversibility, the onsager reciprocal relations, validity and verification.

UNIT-II: Thermodynamics II

15hrs

Fugacity – variation of fugacity with pressure-variation of fugacity with temperature. Thermodynamics of mixing. Methods of determining of the real gas.

Activity and activity coefficient, Choice of standard states-determination of activity and activity coefficients of non-electrolytes. Determination of activity coefficient by e.m.f, the cryoscopic method of determination of activities. Entropy production in open system by (i) heat (ii) matter and (iii) current flow.

Unit III: Chemical Kinetics I

15hrs

3.1 Effect of temperature on reaction rates, Collision theory of reaction rate, collision cross section – effectiveness of collisions – probability factor

3.2 Kinetics of complex reactions – rate expressions for opposing, parallel and consecutive reactions – steady state approximation – kinetics of H_2 & Cl_2 and H_2 & Br_2 reactions.

3.3 Catalysis - Acid –base catalysis – Bronsted relationship – enzyme catalysis. Michaels - Menton kinetics, influence of pH and temperature.

.

Unit IV: Chemical Kinetics II

15hrs

4.1 Reactions in solutions: Effect of ionic strength and dielectric constant on reactions in solutions – cage effect. Primary and secondary salt effect. Kinetic isotopic effect – Linear free energy relationship – Hammett and Taft equations.

4.2 Langmuir and BET adsorption isotherm – adsorption coefficients and its significance

4.3 Kinetic methods of analysis: Flow techniques, relaxation theory and relaxation technique – relaxation methods (T – Jump and P Jump), stopped flow – flash photolysis & pulse radiolysis

UNIT-V: Elements of group theory I

15hrs

Symmetry elements and symmetry operations - group multiplication table (C_2V , C_3V , D_2h)-sub groups, similarity transformation and classes - identifications of symmetry operations and determination of point groups.

RECOMMENDED TEXTBOOKS:

1. S.Glasstone, Thermodynamics For Chemists, Affiliated East West Press, New Delhi, 1950.

2. J.Rajaram and J.C.Kuriacose, Thermodynamics For Students Of Chemistry, Lal Nagin Chand, New Delhi, 1986.
3. K.J.Laidler, Chemical Kinetics, Harpet And Row, New York, 1987.
4. K.V.Raman, Group Theory and It's Applications To Chemistry, Tata Mcgraw Hill Publishing. Co., 1990.

REFERENCE BOOKS:

1. G.K.Vemulapalli, Physical Chemistry, Prentice-Hall,2000.
2. Thomas Engel and Philp Reid, Physical Chemistry, Pearson Education,2006.
3. J.Rajaram and J.C.Kuriacose, Kinetics And Mechanism Of Chemical Transformations. Macmillan India Ltd,1993.
4. K.L.Kapoor, Atext Book Of Physical Chemistry Macmillan India Ltd., 2001.
5. V. Ramakrishnan and M. S. Gopinathan, Group Theory In Chemistry, Vishal Publications, 1998.
6. Bhattacharya: Group Theory And it's Applications.

JOURNALS

- 1.Physical chemistry- An Indian journal
- 2.Journal of chemical thermodynamics
- 3.Journal of physical chemistry A
- 4.Journal of catalysis
- 5.European physical journal D

E-LEARNING RESOURCES:

- <http://infodome.sdsu./research/guides/science/phy.chemistryblr.html>
- <http://www.liv.ac.uk/chemistry/links/reactions.html>
- <http://phychem.chem..uconn.edu/namereact/named.html>
- www.gcocities.com/chempen softwar4ee/reactions.html
- https://chem.libretexts.org/Bookshelves/Physical_and_Theoretical_Chemistry_Textbook_Maps/DeVoe's_%22Thermodynamics_and_Chemistry%22/09%3A_Mixtures/9.2_Partial_Molar_Quantities
- https://application.wiley-vch.de/books/sample/3527330747_c01.pdf
- <https://www.jmilne.org/math/CourseNotes/GT.pdf>
- <https://www3.nd.edu/~powers/ame.20231/planckdover.pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Students will be able to draw character table and point groups and analyses the hybridization of given compound.
CO 2	Critique the chemical potential and fugacity.
CO 3	Demonstrate Clausius Clapeyron equation and its applications.

CO 4	Assess the knowledge of Mechanism for chemical reactions for optimizing the experimental conditions and applications of enzyme catalysis in chemical system
CO 5	Identify the symmetry elements, symmetry operations and point groups.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	2
CO2	2	3	2	2	2
CO3	2	2	2	1	2
CO4	2	3	3	1	2
CO5	3	1	3	3	3
AVERAGE	2.4	2.4	2.6	2.0	2.2

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1 NO CORELATION-0

SEMESTER I
ELECTIVE MAJOR II
MOLECULAR SPECTROSCOPY I & ANALYTICAL
CHEMISTRY I

Total Hrs:75

Course Code: 176304

No. of Credits : 3

COURSE OBJECTIVES:

- Explain the fundamentals concepts, principles, effects & applications of UV Spectroscopy
- To analyse the compounds using Vibrational spectroscopy
- Combined effect of the IR and Raman spectroscopy in identifying simple compounds
- Outline the determination of molecular formula of the compounds
- Identify the compounds through chromatographic techniques

COURSE OUTLINE:

UNIT- I Fundamentals of Spectroscopy, UV Spectroscopy. 15hrs

Interaction of molecules with electromagnetic radiation - types of regions and representation of spectra. Resolution and intensity of spectral transition: signal-to-noise ratio; width of spectral lines-collision broadening, Doppler broadening, Heisenberg uncertainty principle; Intensity of spectral lines-brief idea of selection rules and transition probability, Boltzmann distribution. Enhancing sensitivity of spectral lines: Fourier transform (FT) and computer averaging techniques (CAT).

Electronic spectra of molecules: Franck-Condon Principle, selection rules(brief idea), intensity of electronic transition, vibronic coupling, types of electronic transitions-chromophore, auxochrome, bathochromic and hypsochromic shift- hyperchromic and hypochromic shift-Factors affecting absorbance, Woodward Fieser rules(only for conjugated dienes)- steric inhibition of resonance- Applications. A few examples of natural conjugated systems absorbing in visible region-Instrumentation of double beam UV spectrophotometer.

UNIT – II Vibrational Spectroscopy

15hrs

IR spectroscopy-Bonds as anharmonic oscillator- Morse curve- oscillation frequency(only equation)-explaining fundamental absorptions, first and second overtones with respect to Boltzmann distribution-selection rules-fundamental vibrations of polyatomic molecules, combination and difference bands- Instrumentation and sampling techniques in IR spectroscopy. Fermi resonance, finger print region, characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, esters, amides, ethers, phenols, amines, carbonyl compounds, acids. Effect of solvent and hydrogen bonding on vibrational frequencies, uses of group frequencies in the structural elucidation of metal complexes containing cyanide, nitro, ammine, thiocyanate, and halogens as ligands-metal carbonyls.

UNIT – III Raman Spectroscopy

15hrs

Raman Effect: Rayleigh and Raman scattering, Stokes' and anti-Stokes' radiation, molecular polarizability, Raman selection rules, rule of mutual exclusion, Depolarization ratio, instrumentation.

Combined uses of IR and Raman spectroscopy in the structural elucidation of simple molecules like H₂O, ClF₃, SO₂, CO₂, N₂O. Advantages of Raman spectroscopy over IR. Differences between Raman and IR spectroscopy.

UNIT -IV Mass spectrometry

15hrs

Mass spectrometry: ion production-electron impact and emical ionization, field desorption, electrospray ionization, MALDI- ion analysis-magnetic field reflections, quadrupole mass spectrometry, time of flight.

Determination of molecular formula: molecular ion and isotope peaks, fragmentation, Rearrangements nitrogen rule, metastable ions, metastable peaks, retro Diels-Alder fragmentation-McLafferty rearrangement, loss of odd electron, neutral fragments from molecular ions- Factors which influence fragment abundance-Mass spectra of various functional groups containing compounds to be studied: aromatic, aliphatic hydrocarbons, ketones, acids, esters, amides, ethers, alcohols, amine and nitriles.

UNIT V – Chromatography

15hrs

Chromatography: Gas – liquid chromatography, Principles, retention volume, retention time, Instrumentation – Column, Stationary Phase, carrier gas, Detectors – Thermal conductivity, Flame Ionisation, electron capture, Application of GLC - High performance liquid chromatography - Ion exchange chromatography-application with reference to separation of transition metal ions and lanthanides.

RECOMMENDED TEXTBOOKS:

1. Chemical Analysis: An Instrumental Approach, A.K. Srivastava and P.C. Jain
2. Application of absorption spectroscopy of organic compounds by J. Dyer, Prentice and Hall of India, Pvt., New Delhi.

3. Fundamentals of molecular spectroscopy, C.N. Banwell
4. Spectroscopy W. Kemp, Macmillan Ltd.,
5. Structural identification of organic compounds Y.R. Sharma, S. Chand & Co.
6. Analytical Chemistry – R.Gopalan – Sultan Chand
7. Instrumental methods of analysis – Skoog

REFERENCE BOOKS:

1. Organic Spectroscopy, William Kemp
2. Chemical Analysis: An Instrumental Approach, A.K. Srivastava and P.C. Jain
3. Application of absorption spectroscopy of organic compounds by J. Dyer, Prentice and Hall of India, Pvt., New Delhi.
4. Spectrometric identification of organic compounds by R.M. Silverstein, G.d. Bassler and Monsu. John Wiley and Sons, New York.
5. Introduction to the spectroscopic methods for the identification organic compounds - 2 volumes, Schiemann Pergamman Press.
6. Organic Chemistry, Vol. II, I.L. Finar, 5th edition ELBS publication.
7. Spectroscopy of Organic compounds by P.S. Kalsi, Wiley Eastern Ltd., Chennai.
8. Advanced organic Chemistry by Francis A. Carey and Richard J. Sundberg, 3rd Edition (1990).
9. Spectroscopy W. Kemp, Macmillan Ltd.,
10. Structural identification of organic compounds Y.R. Sharma, S. Chand & Co.
Fundamentals of molecular spectroscopy, C.N. Banwell

JOURNALS:

1. [Journal of Molecular Spectroscopy | ScienceDirect.com](#)
2. [Journal of Vibrational spectroscopy - Elsevier](#)
3. [Journal of Spectroscopy— An Open Access Journal](#)
4. [Journal of Applied Spectroscopy - Springer](#)
5. [Spectroscopy - OMICS International | Open Access Journals](#)

E-LEARNING RESOURCES:

1. <http://info.dome.sdsu.edu/research/guides/science/anal.chemistryblr.html>
2. <http://www.liv.ac.uk/chemistry/links/reactions.html>
3. <http://analchem.chem.uconn.edu/namereact/named.html>
4. www.gcocities.com/chempensoftwar4ee/reactions.html

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Discussed the fundamentals and concepts of spectroscopy. studied principles, effects & applications of UV Spectroscopy
CO 2	Utilized the vibrational spectroscopy to identify Organic functional groups and metal complexes
CO 3	Outlined the combined Uses of the IR and Raman spectroscopy in the analysis of simple compounds
CO 4	To compute the molecular formula of various functional groups using mass spectra
CO 5	Compiled the purification and separation through chromatography .To utilize variety of chromatographic technique to analyze samples

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	3	3	3
CO2	3	2	1	2	1
CO3	1	3	2	3	3
CO4	3	1	3	2	2
CO5	3	2	3	3	3
AVERAGE	2.4	2.2	2.4	2.6	2.4

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORRELATION-0

SEMESTER II CORE PAPER III ORGANIC CHEMISTRY II

Total Hrs:75

Course Code:176305

No. of Credits : 4

COURSE OBJECTIVES:

- To understand the mechanism of electrophilic substitution of aliphatic, aromatic and heterocyclic systems
- To learn the mechanism of elimination reaction
- To gain knowledge of addition reactions to carbon -carbon and carbon - hetero multiple bonds.
- To understand the various rearrangement reactions and their importance
- To gain knowledge on various oxidizing and reducing agents used in organic synthesis

COURSE OUTLINE:

UNIT-I: Electrophilic Substitution

15hrs

Aliphatic electrophilic substitution: SE^1 , SE^2 and SE_i mechanism, double bond shift - Reactivity. Migration of double bond, keto-enol interconversion, HVZ reaction, Stark-Enamine reaction.

Aromatic electrophilic substitution: The arenium ion mechanism. Orientation and reactivity (ortho, meta and para directing groups) Typical reactions - nitration, halogenation, alkylation, acylation and diazonium coupling - Formylation-Reimer-Tiemann reaction, Vilsmeier-Hack, Gattermann, Gattermann-Koch - Kolbe-Schmitt reaction. Orientation in disubstituted benzenes.

Electrophilic substitution of furan, pyrrole, thiophene and pyridine-N-oxide.

UNIT-II : Elimination reactions

15hrs

$E1$, $E2$ and $E1CB$ mechanism - Orientation of the double bond - Hoffman and Saytzeff rules - Competition between elimination and substitution. Effect of substrate, attacking base, leaving group and medium- Stereochemistry of $E2$ eliminations in cyclohexane systems. Mechanism of pyrolytic eliminations- Bamford- Stevens reaction. Chugaev reaction, Hofmann degradation, Cope elimination.

UNIT-III: Addition to carbon - carbon and carbon - hetero multiple bonds

15hrs

Mechanism: Electrophilic, nucleophilic and free radical addition. Orientation and reactivity – stereochemical orientation, Hydroboration, hydroxylations of olefins with OsO_4 , $KMnO_4$, Woodward and Prevost (both cis and trans), Michael addition, Carbenes and their additions

to double bonds - Simmon - Smith reaction. Mannich, Stobbe, Darzen and Benzoin reactions –Wittig reaction, Claisen reaction and Dieckmann reaction.

UNIT- IV: Molecular rearrangements

15hrs

Suitable examples of the mechanism of the following rearrangements: Pinacol - Pinacolone - Wagner – Meerwein rearrangement, Rearrangements involving electron deficient species: Wolff, Fries, Lossen, Schmidt, Stevens, Favorski and dienone-phenol, Demjanov, Baeyer - Villiger and Von Richter rearrangements, Arndt-Eistert synthesis, Fischer-indole synthesis, Neber.

UNIT-V: Oxidation and Reduction

15hrs

Oxidations with Cr(VI), modified Cr(VI)-PCC, PDC, Jones, Collins, DMP, DMSO, SeO₂, DDQ, NBS, epoxidation - sharpless asymmetric oxidation, Jacobsen epoxidation, Shi epoxidation, Swern oxidation, IBX, DMP, CAN, TPAP, NOCl, Reduction : Synthetic importance of Clemmenson and Wolf-Kishner reductions , Birch reduction, MPV reduction. Catalytic hydrogenation, Reduction with LiAlH₄, NaBH₄, tritertiarybutoxyaluminium hydride.

RECOMMENDED TEXTBOOKS:

1. Organic Reaction Mechanism: 3rd Edition. V.K. Ahluwalia; Rakesh Kumar, Parshar.
2. Principles of Reaction Mechanism in Organic Chemistry ; Parmer and Chawla
3. Organic Chemistry - Jain and Sharma
4. Organic Reaction Mechanism - P.S. Kalsi
5. Organic Reaction Mechanism - W. Caruthers
6. Reaction, Rearrangements and Reagents ; S.N. Sanyal

REFERENCE BOOKS

1. J. March, Advanced Organic Chemistry, wiley Interscience, 2007.
2. L.F. Fieser and M. Fieser, Organic Chemistry, Asia Publishing House, 2000
3. F. A. Carey & R. J. Sanburg. Advanced Organic Chemistry, Part A and B, 3rd edn.
4. Organic Chemistry, Stanley. H. Pine, 5th Edition, Tata Mcgraw Hill.
5. Organic Chemistry, Morrison and Boyd, Prentice – Hall of India Pvt. Ltd.
6. E.S. Gould, Mechanism and Structure in Organic Chemistry Holt, Rinehart and Winston Inc., 1959.
7. Organic Chemistry, Clayden, Greeves, Warren and Wothers – Oxford University Press.
8. Stereochemistry, Conformation analysis and Mechanism by P.S. Kalsi, 2nd Edition (1993), Wiley Eastern Limited, Chennai.

JOURNALS

1. Journal of Organic Chemistry
2. International journal of Organic Chemistry
3. Asian Journal of Organic Chemistry
4. Organic Chemistry international
5. Indian journal of Chemistry

E-LEARNING RESOURCES:

UNIT	E links
1	https://chem.libretexts.org/Bookshelves/Organic_Chemistry/Book%3A_Organic_Chemistry_-_A%22Carbonyl_Early%22_Approach_(McMichael)/31%3A_Electrophilic_Substitution
2	http://www.chem.ucalgary.ca/courses/350/Carey5th/Ch05/ch5-4.html
3	https://www2.chemistry.msu.edu/faculty/reusch/VirtTxtJml/addene1.htm
4	https://www.masterorganicchemistry.com/2011/10/17/introduction-to-rearrangement-reactions
5	http://leah4sci.com/oxidation-and-reduction-reactions-in-organic-chemistry

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understood the mechanism of electrophilic substitution reaction
CO 2	Learnt in detail the elimination reaction
CO 3	Understood the mechanism of addition reactions
CO 4	Thorough understanding on rearrangement reactions
CO 5	Studied the usage of various oxidising and reducing agents in organic synthesis

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	3	3	3
CO2	3	2	2	3	3
CO3	2	2	2	2	2
CO4	2	3	3	3	3

CO5	2	1	1	2	2
AVERAGE	2.2	2.2	2.2	2.6	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1 NO
CORELATION-0

SEMESTER II
CORE PAPER IV
PHYSICAL CHEMISTRY II

Total Hrs:75

Course Code: 176306

No. of Credits : 4

COURSE OBJECTIVES:

- To use group theory to recognize and assign symmetry characteristic of molecular and objects.
- Understanding of the limitations of classical mechanic at molecular length scales.
- To use the connection of quantum mechanical operators to observables.

- To provide students with basics of electrochemical processes.
- To familiarize students with the principles of electrode process, electro-transfer kinetics.

COURSE OUTLINE:

UNIT- I Applications of group theory

15 hrs

Orthogonality theorem and its consequences - construction of character table for C_{2v} and C_{3v} - hybrid orbitals in non-linear molecules (CH_4 , BF_3 , SF_6 and NH_3). Determination of representations of vibrational modes in non-linear molecules (H_2O , CH_4 , BF_3 , and NH_3). Symmetry selection rules of infra-red and Raman spectra - application of group theory for the electronic spectra of formaldehyde.

UNIT - III Quantum chemistry - I

15 hrs

Inadequacy of classical mechanics: Black body radiation - Planck's quantum theory Postulates, derivation of Planck's radiation law to explain cavity radiation- Photoelectric effect, explanation by quantum theory-Compton effect - explanation by quantum theory and derivation of Compton shift in wavelength. Wave – Particle dualism: de Broglie's concept of matter waves - experimental verification by Davisson and Germer - Heisenberg Uncertainty principle.

UNIT - IV Quantum chemistry - II

15 hrs

Wave nature of the electron, Interpretation of the wave function, Normalized and orthogonal wave functions, Schrodinger's Wave Equation, Eigen functions and eigen values - significance - Linear and Hermitian operators - significance Schrodinger time - independent wave equation-derivation - Physical significance of ψ^2 .

UNIT- IV Electrochemistry I

15 hrs

Ion-solvent integration: Solvation of ions - solvation number - determination of primary solvation number - Born's treatment of ion solvent interaction - Derivation of enthalpy, free energy and entropy of ion solvent interaction.

Ion-ion interaction and activity coefficient - concept of ionic atmosphere - Derivation of Debye - Huckel limiting law - verification and experimental validity. Debye Huckel equation – extension to solutions of higher concentrations.

UNIT –V Electrochemistry II

15 hrs

Electrodics : electrode – electrolyte interface, electro kinetic phenomena – zeta potential – electrical double layer – Helmholtz, Gouy-Chapman and Stern model – weakness of Gouy Chapmann theory - electrocapillary – effect of concentration and different ions on electrocapillary curves, Lippmann equation – electrocapillary maximum – inadequacy of Helmholtz model – Diffuse charge model of Gouy Chapmann. Electrokinetic phenomenon – electroosmosis and electrophoresis based on fluxes

RECOMMENDED TEXTBOOKS :

1. R.K.Prasad - Quantum chemistry
2. Electrochemistry by B. Viswanathan, R. Venkataraman, Dr. K. Rengarajan, Dr.S. Sundaram and Dr. P.S. Raghavan 2007.
3. Group theory – M.S.Gopinath
- 4.. An Introduction To Electrochemistry by Samuel Glasstone

REFERENCE BOOKS:

1. D.A.Mcquarrie-Quantum Chemistry.
2. A.J. Bard and L.R.Faulknes, Electrochemical methods : fundamentals and applications, 2nd Ex. John Wiley and Sons.
3. Cotton F.A(2004) Chemical application of group theory 3rd edition. John Wiley & Sons.
4. Ira Levine - Quantum chemis
5. Modern electrochemistry - a fundamentals of electrodics by Bockris J

JOURNALS:

1. Journal of applied electrochemistry <https://link.springer.com/journal/10800>
2. Asian Journal of chemistry- Asian publication corp.
https://www.researchgate.net/journal/0970-7077_Asian_Journal_of_Chemistry
3. Physical chemistry – A –ACS <https://pubs.acs.org/journal/jpcafh>

E-LEARNING RESOURCES

UNIT	E links
1	https://ursula.chem.yale.edu/batesta/classes/vvv/v570
2	https://ocw.mit.edu/course/chemistry/lecture-notes .
3	http://www.ks.vivc.edu/class/phys480/qm_pdf/qm_book
4	https://www.academia.edu/35842541/Equilibrium Electrochemistry
5	https://en.wikipedia.org/wiki/Electrochemistry

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Visualizing & solving group theory problems
CO 2	Explain & appreciate the significance of quantum mechanics
CO 3	Designs classical mechanics at molecular length
CO 4	Able to understand the concept of electrodicts.
CO 5	Gains a fundamental knowledge about the different models of electrodes.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	1	3	3
CO2	2	2	3	2	2
CO3	2	3	3	3	3
CO4	1	3	2	1	2
CO5	3	3	1	3	3
AVERAGE	2.2	2.8	2	2.4	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER II

CORE PAPER V

MOLECULAR SPECTROSCOPY AND ANALYTICAL CHEMISTRY

Total Hrs:75

Course Code:176307

No. of Credits : 4

COURSE OBJECTIVES:

- Explain the concepts, principles, effects & applications in NMR Spectroscopy
- Compare the NMR techniques and ESR spectroscopy
- Predict the Mossbauer and photoelectron spectroscopy
- Outline the electro analytical techniques with titrations
- Identify the polarimetric techniques and analyse the rules involved in it

COURSE OUTLINE:

UNIT - I Nuclear Magnetic Resonance spectroscopy hrs

15

Theory of Magnetic Resonance spectroscopy- population of energy levels - equation of motion of spin in magnetic fields-relaxation times-instrumentation-chemical shift-spin-spin coupling-NMR of simple AX and AMX type molecules- Proton(¹H) chemical shift, spin-spin coupling, coupling constants factors influencing proton chemical shift - vicinal proton - proton coupling

constant - spin decoupling - Improving the NMR spectrum- shift reagents. Effect of changing the magnetic field. nuclear overhauser effect- Applications to organic structures, a brief qualitative discussion of Fourier transform spectroscopy(simple problems involving UV,IR and NMR- to be solved)

UNIT – II ^{13}C and 2D NMR and ESR spectroscopy **15**
hrs

^{13}C resonance spectroscopy – Comparison of ^{13}C NMR and ^1H NMR - Chemical shift – Factors affecting chemical shift – Chemical shifts of aliphatic, olefinic, alkynes, aromatic, carbonyl carbon.

2D NMR spectroscopy (only elementary idea) about COSY, NOESY.

ESR spectroscopy - difference between ESR and NMR –ENDOR-ELDOR - Hyperfine splitting- relation between hyperfine splitting and unpaired electron density - McConnell equation. Applications of ESR spectroscopy. ESR instrumentation.

UNIT –III Mössbauer & Photoelectron spectroscopy **15**
hrs

Principles of Mössbauer spectroscopy: Doppler shift, recoil energy, experimental technique-sources, absorber, calibration.

Mössbauer spectra: isomer shift, quadrupole splitting, magnetic hyperfine interaction-chemical applications- isomer shift and quadrupole splitting in iron complexes.

Photoelectron spectroscopy (PES): principle – Auger electron - Applications of ultraviolet PES, X-ray PES.

UNIT- IV Electro Analytical Chemistry **15**
hrs

Polarography – theory, instrumentation, DME, Diffusion, kinetic and catalytic currents, Current – Voltage curves for reversible and irreversible systems, qualitative and quantitative applications to inorganic systems.

Amperometric titrations – theory, instrumentation, types of titration curves, Biamperometry, applications.

Cyclic voltametry – Theory, Instrumentation, Applications to inorganic systems.

UNIT- V Polarimetry **15**
hrs

Principles- Optical rotatory dispersion and circular dichroism in organic chemistry.

Definition of: Rotatory dispersion, circular dichroism, Cotton effect. Dispersion curves-

Recognition and location of a carbonyl group in an asymmetric environment. The octant rule and the haloketone rule.

RECOMMENDED TEXTBOOKS:

1. Organic Spectroscopy, William Kemp

2. Chemical Analysis: An Instrumental Approach, A.K. Srivastava and P.C. Jain
3. Application of absorption spectroscopy of organic compounds by J. Dyer, Prentice and Hall of India, Pvt., New Delhi.
4. Fundamentals of molecular spectroscopy, C.N. Banwell
5. Spectroscopy W. Kemp, Macmillan Ltd.,
6. Structural identification of organic compounds Y.R. Sharma, S. Chand & Co.
7. Analytical Chemistry – R.Gopalan – Sultan Chand
8. Instrumental methods of analysis – Skoog

REFERENCE BOOKS:

1. Spectrometric identification of organic compounds by R.M. Silverstein, G.d. Bassler and Monsu. John Wiley and Sons, New York.
2. Introduction to the spectroscopic methods for the identification organic compounds - 2 volumes, Schiemann Pergamman Press.
3. Organic Chemistry, Vol. II, I.L. Finar, 5th edition ELBS publication.
4. Spectroscopy of Organic compounds by P.S. Kalsi, Wiley Eastern Ltd., Chennai.
5. Advanced organic Chemistry by Francis A. Carey and Richard J. Sundberg, 3rd Edition (1990).
6. Analytical Chemistry – S.M. Khopkar - New Age International
7. Analytical Chemistry – R.Gopalan – Sultan Chand
8. Fundamental of analytical Chemsitry – A.Skoog and West.M

JOURNALS:

1. [Journal of Electroanalytical Chemistry - Elsevier](#)
2. [Journal of Molecular Spectroscopy | ScienceDirect.com](#)
3. [Journal of Spectroscopy— An Open Access Journal](#)
4. [Journal of Applied Spectroscopy - Springer](#)
5. Spectroscopy - OMICS International | Open Access Journals

E-LEARNING RESOURCES:

UNIT	E – LINKS
1	https://en.wikipedia.org/wiki/Nuclear_magnetic_resonance_spectroscopy https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/proton-nmr/v/spin-spin-splitting-coupling

	https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/proton-nmr/v/coupling-constant https://en.m.wikipedia.org/wiki/Fourier-transform_spectroscopy
2	https://www.chemguide.co.uk/analysis/nmr/interpretc13.html https://en.wikipedia.org/wiki/Two-dimensional_nuclear_magnetic_resonance_spectroscopy http://www.rsic.iitb.ac.in/esr.html
3	https://www.slideshare.net/chemsant/mossbauer-spectroscopy-principles-and-applications-26891122 https://www.khanacademy.org/science/chemistry/electronic-structure-of-atoms/electron-configurations-jay-sal/a/photoelectron-spectroscopy
4	https://en.wikipedia.org/wiki/Electroanalytical_methods https://en.wikipedia.org/wiki/Amperometric_titration https://sop4cv.com/chapters/WhatIsCyclicVoltammetry.html
5	https://en.wikipedia.org/wiki/Polarimetry https://en.wikipedia.org/wiki/Optical_rotatory_dispersion https://www.pharmatutor.org/pharma-analysis/cotton-effect-curves-and-octant-rule

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Discussed the concepts, principles, effects & applications in NMR Spectroscopy
CO 2	Utilized the NMR techniques and ESR spectroscopy in application of organic compounds
CO 3	Used the Mossbauer and photoelectron spectroscopy in evaluating the analysis of compounds

CO 4	Explained the quantitative and qualitative applications in electro analytical techniques
CO 5	Predicted the curves and rules involved in the polarimetric techniques

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	2	3	2	2	3
CO3	3	3	3	3	2
CO4	3	3	2	3	3
CO5	1	2	2	2	2
AVERAGE	2	3	2	3	3

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER II
CORE PAPER VI
PRACTICALS-I INORGANIC-I

Total Hrs: 90

Course Code:176308

No. of Credits : 4

COURSE OBJECTIVES: To enable the students to

-

- To identify the methodology to estimate a metal ion in the presence of another metal ion.
- To improve the skill in quantitative estimation of metal ions by colorimetry.

COURSE OUTLINE:

I. Volumetric and gravimetric estimations

1. Estimation of copper and nickel.
2. Estimation of copper and zinc.
3. Estimation of Iron and Zinc.
4. Estimation of percentage purity of Manganese dioxide in Pyrolusite.
5. Estimation of Calcium and Magnesium in Dolomite

II. Colorimetric estimation

1. Estimation of copper.
2. Estimation of nickel.
3. Estimation of iron.

RECOMMENDED TEXTBOOKS:

1. Vogel, Text book of Inorganic quantitative analysis.
2. Practical Chemistry by O.P. Pandey, D.N. Bajpai and S. Giri Reprint 2005
3. Advanced Inorganic Analysis by Dr. Subhash Satish.
4. V. Venkatesan, R. Veeraswamy, A.R. Kulandaivelu, Basic Principles of Practical Chemistry, S.Chand and Sons, 2004.

REFERENCE BOOKS:

1. Palmer, W. G. Experimental Inorganic Chemistry; Cambridge University Press, 1954.
2. Pass, G.; Sutcliffe, H. Practical Inorganic Chemistry; Chapman Hall, 1965.
3. Jeffery, G. H.; Bassett, J.; Mendham, J.; Denney, R. C. Vogel's 's Textbook of Quantitative Chemical Analysis; 5th ed., ELBS" 1989.

JOURNALS:

<https://pubs.acs.org/doi/abs/10.1021/ed039p90>
<https://pubs.acs.org/doi/abs/10.1021/ed019p397.3>
<https://www.longdom.org/scholarly/gravimetric-analysis-journals-articles-ppts-list-1488.html>

E-LEARNING RESOURCES:

<https://onlinelibrary.wiley.com/doi/abs/10.1002/ange.19500620126>
<https://www.britannica.com/science/volumetric-analysis>

COURSE OUTCOMES:

CO	CO STATEMENT
Volumetric and gravimetric estimations	To learn the details of the concept of volumetric and gravimetric analysis, detailed procedure. Factors affecting gravimetric analysis quality of precipitate. The students will also be familiar with the concept of precipitation from homogenous solution and applications
Colorimetric estimation	Familiar with the principle , instrumentation and applications of electroanalytical techniques of coulometry

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	2	2
CO2	3	3	2	2	2
AVERAGE	3	2.5	2.5	2	2

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

SEMESTER II
CORE PAPER VII
PRACTICALS – II (ORGANIC)

Total Hrs: 90

Course Code: 176309

No. of Credits : 4

COURSE OBJECTIVES:

- To learn the techniques of separation of organic mixture.

- To apply the skill in double stage preparation, purification and recrystallisation.
- To train the student in the analysis of organic estimation.
- To gain basic knowledge on chromatographic technique
- To familiarize the systematic procedure for organic substances analysis

COURSE OUTLINE:

I. Analysis of organic mixture.

Qualitative organic analysis: Separation and characterisation of two components in a mixture and preparation of their derivatives.

II. Synthesis of an organic compound involving double stage (any three).

1. p-nitroaniline from acetanilide.
1. m-nitrobenzoic acid from methylbenzoate.
2. Benzanilide from benzophenone.
3. 2,4-dinitrobenzoic acid from p-nitrotoluene.
4. Tribromobenzene from aniline.

III. Organic Estimation

1. Estimation of Phenol/aniline.
2. Estimation of ethyl methyl ketone.
3. Estimation of glucose
4. Saponification value of an oil.

IV. Separation of amino acids by chromatographic technique (demonstration)

RECOMMENDED TEXTBOOKS:

1. N.S. Gnanapragasam, G. Ramamurthy, Organic Chemistry Lab Manual, S.Vishwanath Printers & Publishers Pvt. Ltd., Chennai, 2010.
2. Raj . K. Bansal, Laboratory Manual of Organic Chemistry, Wiley Eastern Limited.
3. Mann & Saunders, Laboratory Manual of Organic Chemistry
4. V. Venkatesan, R. Veeraswamy, A.R. Kulandaivelu, Basic Principles of Practical Chemistry, S.Chand and Sons, 2004.

REFERENCE BOOKS:

1. .Douglas A. Skoog, Principles of Instrumental Analysis, 3rd Edition, 1997
2. .Arthur I. Vogel, A Text Book of Practical Organic Chemistry, Longman Sc & Tech, 4 edition, 1978
3. Vogel, Text book of Inorganic quantitative analysis, Longman Sc & Tech, 4 edition, 1980.

Journals

1. [Organic & Inorganic Chemistry Journals | Open Access](#)
2. [Functional Group Analysis | Journal of Chemical Education](#)
3. <https://www.beilstein-journals.org/bjoc/articles/8/231>
4. <https://www.organicdivision.org/journals/>
5. <http://www.orgsyn.org/>

E-LEARNING RESOURCES:

Organic	E Links
Analysis , Synthesis and Estimation of Organic compounds	https://byjus.com/jee/qualitative-analysis-of-organic-compounds/
	doc>org">https://www.scribd.com>doc>org
	http://pubs.rsc.org/lus/methods-in-organic-synthesis

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Analysed different Aromatic compounds
CO 2	Learnt the synthesis of different organic compounds
CO 3	Analysed and estimated synthetically important compounds
CO 4	Understood of chromatographic principles

➤ MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	1	3	3
CO2	3	1	3	3	1
CO3	3	3	3	2	3
CO4	2	3	2	3	3
AVERAGE	2.75	2.5	2.25	2.75	2.5

SEMESTER II
MAJOR ELECTIVE III
NANO SCIENCE AND TECHNOLOGY

Total Hrs:60

Course Code: 176310

No. of Credits : 4

COURSE OBJECTIVES:

- To impart the basic knowledge on nanoscience and technology.
- To understand the various process techniques available for the processing of nanostructured materials.
- To instruct knowledge on the exotic properties of nanostructured materials at their nanoscale lengths.
- To acquire the knowledge of the various nanoparticles process methods and their skills.
- To study their active merits of various process techniques.

COURSE OUTLINE:

12hrs

UNIT – I Overview of nanoscience

Nanorevolution –nano scale - Basic idea of nanomaterials - Structure-Nucleation and grain growth- Grain boundaries - Properties at nanoscale -Strength and Hardness, optical, electrical, magnetic, mechanical and chemical properties. Nanotubes – Carbon Nanotubes – Single Walled Carbon Nanotubes – Semiconductor Nanoparticles - Energy band structure of semiconductors-Quantum dots – Quantization effect.

UNIT – II Synthesis of nanomaterials

12hrs

Nanostructured materials – Types – Physical and Chemical Synthesis – Top down approach – bottom up approach-Arc discharge method- ball milling, inert gas condensation, CVD, Sol-gel method,Langmuir Blodgett films –Electrodeposition -Spray pyrolysis- Flame pyrolysis-Molecular beam epitaxy.

UNIT- III Characterization of nanomaterials

12hrs

Theories and Techniques - characterization using UV Visible, XRD, SEM, TEM, AFM, XPS, SPM and XANES in relation with nano particles. (only brief idea)

UNIT – IV Nanomedicines

12hrs

Nanomedicines – Introduction - Drug delivery – Drug Encapsulations – Ag, Au, Fe, Cu -Drug discovery– Tissue repairs and replacement - Scaffolds- Bone repair –Smart materials – Molecular nanotechnology-MEMS,NEMS, BioMEMS, Nanobiosensor –Physical,Chemical and Biological sensors. (each one example)

UNIT- V Applications of nanoscience

12hrs

Nanoscience and Nanotechnology — Nanotechnology and environment – Pollution control – Atmosphere soil and water cleaning – Nuclear waste – Green products- Applications of nanoscience in catalysis,cosmetics,computing. Applications of carbon nano tubes, Solar energy conversion - uses of nanocomposites, nanotechnology in agriculture, fertilizer and pesticides, implications of nanotechnology-health, society and environment.

RECOMMENDED TEXTBOOKS:

- 1.C. P. Poole and J.F. Owens, “Introduction to Nanotechnology”, Wiley Interscience, 2003.
2. M. A. Ratner. and D. Ratner, “Nanotechnology: A Gentle Introduction to the Next Big Idea”, Prentice Hall PTR, First Edition, 2002.
3. T. Pradeep, “Nano: The Essential Nanoscience and Nanotechnology”, Tata McGraw hill, 2007.
4. G. Cao,“Nanostructures & Nanomaterials: Synthesis, Properties &Applications”,Imperial College Press, 2004
5. C.N.R. Rao, A. Muller and A.K. Cheetham, “The Chemistry of nanomaterials: Synthesis, Properties and Applications”, Wiley-VCH verlag GmBH & Co.KGA, 2004

REFERENCE BOOKS:

1. Risal Singh Shipra Mital Gupta, “ [Introduction to nanotechnology](#)” – 2018
2. Gabor L. Hornyak, H.F. Tibbals, John J. Moore, and Joydeep Dutta, “Introduction to Nanoscience and Nanotechnology”-2008
3. Sneha Mohan Bhagyaraj, Oluwatobi Samuel Oluwafemi, Nandakumar Kalarikkal, Sabu Thomas, “ Characterization of Nanomaterials: Advances and Key Technologies”
4. “The Nanoscope” – Encyclopedia of Nanoscience and Nanotechnology – Vol. I to Vol. VI. – Ed. Dr. Parag Diwan and Ashish Bharadwaj, Pentagon Press, New Delhi(2005).
5. “Nanostructures, Theory and Modelling” - C. Delerue and M.Lannoo Springer (2004).
6. Nano: the essentials, Pradeep T.,Tata McGraw Hill, New Delhi, 2007.
7. Charles. P. Poole and Frank J Owens, Introduction to Nanotechnology, Artech House, 2005.
8. Hari Singh Nalwa, Nanostructured materials and Nanotechnology, Academic Press 2002.

JOURNALS:

1. Journal of Applied Pharmaceutical Science 01 (06); 2011: 228-234.
2. The Journal of Technology Transfer October 2008, Volume 33, Issue 5, pp 472–484\

E-LEARNING RESOURCES:

1. <http://www.jnanobiotechnology.com/content/2/1/3>
2. www.jabsonline.com.
3. <http://dx.doi.org/10.1155/2009/184702>
4. <https://www.researchgate.net/publication/274837597>
5. <http://www.nanotec.org.uk/>

COURSE OUTCOME:

CO Number	CO STATEMENT
CO1	To evaluate about the definition of a nano system and the basic concepts of nanoscience and technology
CO2	To discuss about the Scope of nanoscience and technology and commercial applications of Nanotechnology
CO3	To explain about the Synthesis and surface properties of nanomaterials

CO4	To compute about the Methods of self-assembly and applications of self assembled monolayers
CO5	To discuss the detail study of Applications of metal nanoparticles in technologically imperative fields

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	3	2	2	2	2
CO3	3	3	3	3	3
CO4	2	2	2	2	2
CO5	2	3	1	3	3
AVERAGE	2.6	2.4	2.2	2.6	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

SEMESTER II
EXTRA DISCIPLINARY ELECTIVE -I
NOVEL CHEMISTRY

Total Hrs:45

Course Code:176311

No. of Credits : 3

COURSE OBJECTIVES:

To enable the students to

- Develop a brief idea about Forensic science and the techniques used
- Acquire knowledge about the preparation procedure for cosmetic products
- Understand the methods in leather tanning
- Familiarize the Idea about milk and its products preparations
- Explore the importance of medicinal plants and their uses

COURSE OUTLINE:

UNIT-I

9hrs

Forensic

1.1 Definition and need of Forensic science, Basic principles of Forensic science.

1.2 Investigation technique, Physical evidence, Classification, Significance of finger print and palm, Foot print, shoe and tyre impressions.

1.3 Evidence from the fire affected area, poison and explosives.

UNIT – II

Cosmotology

9hrs

Personal care products

Introduction, Cream-face cream, cold cream, vanishing cream. Face washes, Toilet powders, Tooth paste, Shampoos. Allergy testing for cosmetics

UNIT –III

9hrs

Leather chemistry

Introduction, Difference between skin and hide, Manufacture of Leather, Preparation of Hides for Tanning, Types of Tanning- Vegetable, Synthetic Chrome, Aldehyde tannage, Oil tanning.

UNIT –IV

9hrs

Dairy Chemistry

Milk – Definition, Composition of Milk, Physical properties of milk – Acidity, Viscosity, Boiling point, Freezing point. Chemical changes during milk processing - Pasteurisation, Homogenisation. Special milk - Toned milk, Double toned milk, Sterilized milk, Flavoured milk.

UNIT –V

9hrs

Medicinal plants

Medicinal properties and uses of -Hibiscus Rosasinesis (sembarithi), Adathoda Vasica (Adadodai), Ocimum Sanctum (Tulsi), Phyllanthus Niruri (Killaynelli), Azadirachta Indica (Vepa), Solanum Trilobatum (Thuduvalai), Greens – Tinospora condifolia (Sindal), Basella alba (Vasalakkirai), Portulaca oleracea (Pulikkirai), Portulaca quadrifida (Passalaikkirai).

RECOMMENDED TEXTBOOKS:

1. A Text Book of pharmaceutical Chemistry – Jayashree Chosh – S.Chand
2. Pharmaceutical Chemistry – S.Lakshmi - S.Chand

REFERENCE BOOKS:

1. Principles of medicinal chemistry, Lea and Febiger
2. Fundamentals of Dairy Chemistry- Noble P. Wong
3. Forensic Chemistry -David E. Newton
4. Chemistry of Vegetable Tannins –E. Haslam, Academic Press, N. Y
5. Text book of Cosmetic Formulation -Gaurav Kumar Sharma Jayesh Gadhiya

JOURNALS:

<https://www.springer.com/gp/book/9780442204891>

<https://www.rsc.org/journals-books-databases/about-journals/njc/>

<https://www.innovativepublication.com/journal/IJPCA>

E-LEARNING RESOURCES:

<https://www.sciencedirect.com/>

<https://www.techsciresearch.com/news/186-us-cosmetic-chemicals-market-to-grow-due-to-increasing-demand-for-personal-care-products.html>

<https://www.cambridge.org/core/journals/journal-of-dairy-research/article/section-c-dairy-chemistry-some-aspects-of-the-physical-chemistry-of-the-salts-of-milk/5E2A634D06A0766D6845F6FA565A60E8>

<https://onlinelibrary.wiley.com/doi/pdf/>

<https://pubs.acs.org/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Able to identify criminals by physical evidences
CO 2	Formulate the shampoo, facial creams, tooth paste etc -create small scale industry
CO 3	Identify the quality of leather
CO 4	Earn wide knowledge about milk and its products preparations
CO 5	Able to know the importance and uses of medicinal plants, flowers, roots and leaves

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	3
CO2	3	3	3	3	2
CO3	2	3	2	2	3
CO4	3	3	3	3	3
CO5	3	2	3	3	3

AVERAGE	2.8	2.8	2.6	2.6	2.8

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

SEMESTER III
CORE PAPER VIII
INORGANIC CHEMISTRY II

Total Hrs:75

Course Code:176312

No. of Credits : 4

COURSE OBJECTIVES:

- To discuss the substitution reactions of inorganic complexes.
- To explain the learner the various electron transfer reactions in coordination compounds.
- To outline the various types of nuclear reactions.
- To identify the harmful effects of radioactive isotopes and its disposal
- To discuss the various bioinorganic complexes elaborately.

COURSE OUTLINE:

UNIT - I Coordination Chemistry - Reactions of Inorganic Complexes 15hrs

Labile and inert complexes - VBT explanation and Taube's explanation and Taube's explanation of lability and inertness - Ligand substitution reactions in octahedral complexes S_N1 mechanisms (dissociative mechanism) - S_N2 mechanisms (Associative mechanisms) - S_N1CB - substitution, Nucleophilic, unimolecular conjugate Base mechanism - Agnition reaction - Substitution in square planar complexes - trans effect - theories of trans effect - Applications of trans effect - Cis effect - Aquation reactions.

UNIT – II Coordination Chemistry Reactions and Applications 15hrs

Electron transfer Reactions - Outer sphere mechanism - Inner sphere mechanism - OSM versus ISM - Two electron transfers - Non-complementary electron transfer reactions - Marcus theory-Complexometric titrations - Chelating agents, Types of EDTA titrations direct and back titrations, replacement titration, Masking and demasking agents.

UNIT - III Nuclear Chemistry I 15hrs

Fundamental particles - Nuclear spin and moments - N/P ratio - Binding energy and Stability. Origin of nuclear forces -Modes of radio active decay - orbital electron capture - Nuclear isomerism - Internal conversion – Auger effect.

Nuclear structure and stability, packing fraction-Mass defect -Binding energy, -salient features of the liquid drop and the shell model . Detection and determination of activity by Geiger - Muller, scintillation and cherenkov counters-Wilson-Cloud chamber.

Nuclear reactions - Types - Nuclear cross reaction - Q value, threshold energy - compound nuclear theory – Nuclear fission and fusion and spallation reaction - Thermo nuclear reaction stellar energy - Hydrogen burning and carbon burning.

UNIT - IV Nuclear Chemistry II 15hrs

Artificial transmutation - methods of producing projectiles - linear cyclotron - synchrotron – Betatron - Van de Graaff Accelerator.

Activation analysis and Radiometric titrations-Applications of radio isotopes-Disposal of radioactive waste-Dilute and Disperse method, Delay and decay method, Concentrate and Contain method-reprocessing of spent Uranium fuel and its disposal- Recent method to dispose critically dangerous radio waste-chemical method of disposal-other methods-reprocessing, immobilization and by Vitrification.

UNIT-V Bio-Inorganic chemistry

15hrs

Transport proteins, Oxygen carriers – haemoglobin – myoglobin – structure -Oxygenation – Biological redox systems: Cytochromes – classification, Cytochrome a, b and c, Cytochrome – P450, Iron – sulphur proteins – Rubredoxin and ferredoxin, Chlorophylls and Photosynthesis.

Nitrogen fixation – introduction, types of nitrogen fixing micro organisms – nitrogenase enzyme – metal clusters in nitrogenase –redox property – dinitrogencomplexes - Nitrogen fixation via nitride formation and reduction of dinitrogen to ammonia.

Anti cancer agents, role of metal ions, radio isotopes – diagnosis and treatment.

RECOMMENDED TEXTBOOKS:

1. J.E. Huheey - Inorganic Chemistry - Principles, structure and reactivity.
2. F.A. Colton and Wilkinson, Advanced Inorganic Chemistry - A comprehensive text Hohn Wiley and sons.
3. K.F. Purcell and J.C. Kotz - Inorganic Chemistry W.B. Saunders.
4. S.F.A. Kettle - Coordination Chemistry.
5. Elements of Bio-Inorganic Chemistry - G.N. Mukherjee &Arabindadas.

REFERENCE BOOKS:

1. D.F. Shriver, P.W. Atkins and Langford - Inorganic Chemistry.
2. B.N. Figgis - Introduction to ligand field- Wiley- New York.
3. N.D. Hannay solid state chemistry - Prentice hall.
4. F. Basols& R.G. Pearson - Mechanisms of Inorganic reactions - Wiley- New York.
5. Electron transfer reactions of complexes in solution - H. Janbe - Academic press.
6. R. Drago - Physical methods in Inorganic Chemistry - Rehinhold Ny.
7. Source book on Atomic Energy - S. Glasstone.
8. H.J. Arniker - Nuclear chemistry - Wiley Eastern Co.
9. Physical methods in advanced Inorganic Chemistry -H.A.O.Hill and P.Day.
10. Nuclear and radio chemistry - G.Frienlander . J.W. Kennedy & J.M. Miller.
11. R.B.Jordon - Reaction mechanisms of inorganic & organometallic chemistry - OVP.

12. C.V. Shekar - Textbook of Nuclear Chemistry

JOURNALS:

1. Russian Journal of Coordination Chemistry
2. Journal of Inorganic and Nuclear Chemistry

E-LEARNING RESOURCES

- 1 <https://www.researchgate.net>journal>
- 2 <https://www.scimagojr.com>journal>
- 3 <https://www.hindawi.com>jnc>
- 4 <https://www.nature.com>articles>
- 5 <https://www.mdpi.com>sections>

COURSE OUTCOME

CO Number	CO STATEMENT
CO 1	Substitution reactions of inorganic complexes and its utility in research and various fields is discussed.
CO 2	Electron Transfer reactions, types of EDTA titration is outlined.
CO 3	Types of Nuclear reactions is explained in a detailed manner.
CO 4	Hazardous effects of Radioactive isotopes and its precautions are identified.
CO 5	Various bioinorganic complexes and its biological use in medicinal field is explained.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	3
CO2	2	2	3	2	3
CO3	1	3	1	3	2
CO4	3	2	3	2	3
CO5	2	3	3	3	3
AVERAGE	2.2	2.6	2.4	2.2	2.8

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER III
CORE PAPER IX
ORGANIC CHEMISTRY III

Total Hrs:75

Course Code:176313

No. of Credits : 4

COURSE OBJECTIVES:

To enable the student to

- Understand and appreciate the importance of synthesis and applications of physiologically important heterocyclic compounds
- Understand the concepts of retrosynthetic aspects.
- Identify the importance of electrocyclic, cycloaddition and sigmatropic reactions.
- Expose them to understand the applications of various types of reagents in used in research
- Understand different coupling reactions synthesis and their uses in the pharmaceuticals

COURSE OUTLINE:

UNIT-I

Heterocyclic compounds

15hrs

Synthesis and applications of Nonaromatic heterocycles –synthesis of tetrahydrofurans, pyrrolidines, tetrahydropyrans, piperidines, -Five membered ring compounds with two or more

heteroatoms: Imidazoles, Oxazoles, thiazoles, isooxazolone; Six membered ring compounds with two or more heteroatoms: pyrimidines, purines, triazines.

UNIT-II Retrosynthetic analysis

15hrs

An introduction to retrosynthesis - Synthon, Synthetic equivalent, Target molecule, Functional group interconversion - Disconnection approach - One group disconnection - Disconnection of alcohols, olefins and ketones - Logical and illogical disconnections, Two group disconnection - 1,2 - 1,3 - 1,4 - 1,5 difunctional compounds, Retro Diels Alder reaction - pericyclic reactions - Retrosynthesis of some heterocycles containing two nitrogen atoms.

UNIT- III Pericyclic reactions

15hrs

Classification, Woodward- Hoffmann rules- Frontier Molecular Orbital – HOMO- LUMO, Morbuis – Hckel Analysis. Electrocyclic reactions- Conrotatory and dis rotatory motions of $4n$, $4n+2$, allyl systems, selection rules. Cycloaddition reactions- antarafacial and suprafacial additions reactions, notations of cycloaddition in $4n$ and $4n + 2$ systems, 1,3 dipolar cycloaddition reactions, stereochemical effects and effect of substituents on the rate of cycloaddition. Sigmatropic rearrangements- selection rules with suitable examples, 1,3 and 1,5 hydrogen shift- cope and claisen rearrangements.

UNIT- IV Reagents in organic synthesis

15hrs

Use of the following reagents in organic synthesis and functional group transformations: Gilman's reagent, lithium dimethyl cuprate, Lithium diisopropyl amide (LDA), 1,3-dithiane, tri-n-butyltin hydride, , phase transfer catalysts, crown ethers Peterson's synthesis, Wilkinson's catalyst, Baker's yeast.

UNIT- V Novel Reactions

15hrs

Hoffmann-Löffler reaction, Simmon-Smith reaction, Mannich reaction, Baeyer-Villiger reaction, Baylis-Hillman reaction, Biginelli reaction, Mitsunobu reaction, Mukuyama coupling, sonogashira coupling, Heck reaction, Dieckmann reaction, Hiyama coupling, Stille coupling, Suzuki coupling, Japp-Klingemann reaction, pusond- kahn reaction, Nef reaction, metathesis, Henry reaction, Ritter reaction. Etard reaction.

RECOMMENDED TEXTBOOKS:

1. Advanced organic chemistry, Jerry March.
2. Sankararaman, Pericyclic Reactions- A textbook, Wiley –VCH, 2005.
3. Organic reaction mechanism, 3rd Edition, V. K. Ahluwalia, Rakesh Kumar, Parashar
4. Organic Cehmistry, T W Graham Solomon, John Wiley and sons.

REFERENCE BOOKS:

1. Organic Chemistry, Clayden, Greeves, Warren and Wothers – Oxford University Press.
2. Organic Chemistry, Stanley. H. Pine, 5th Edition, Tata Mcgraw Hill.
3. Organic Chemistry, John McMurry, 5th Edition, Asian Books private Ltd.
4. Organic Chemistry, Francis. A. Carey, Macraw Hill Book Company.
5. Organic chemistry and mechanism, E. S. Gould.
6. Organic chemistry, Herbert House.
7. Molecular Reaction and Photochemistry by Charles H. Depuy and Orville, L. Chapman, Prentice Hall of India Pvt., Ltd., New Delhi.
- 8.T.L. Gilchrist, Heterocyclic Chemistry, Longman Scientific and Tech, 1985

JOURNALS

1. <https://www.scirp.org/journal/paperinformation.aspx?paperid=70685>
2. <https://www.nature.com/subjects/cross-coupling-reactions>
3. Asian Journal of Organic Chemistry
4. Journal of the American Chemical Society.
5. International journal of Organic Chemistry

E-LEARNING RESOURCES

- 1.<https://www.khanacademy.org/science/organic-chemistry>
- 2.<https://www.acs.org/content/acs/en/greenchemistry/students-educators/online-educational-resources.html>
- 3.https://study.com/articles/List_of_Free_Online_Organic_Chemistry_Courses_Classes_and_Learning_Materials.html
- 4.<https://www.masterorganicchemistry.com/resource-guide/>
- 5.<https://www.worldcat.org/title/pericyclic-reactions-a-mechanistic-and-problem-solving-approach/oclc/922451331>
- 6.<https://www.link-group.eu/portfolio/link-elearning>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Able to understand the nature of carbon-hetero atom multiple bond additions
CO 2	Design synthetic route for organic molecules
CO 3	Identify the nature of addition in pericyclic reactions
CO 4	Apply the knowledge to formulate a chemical reactions in organic synthesis to industry and research
CO 5	Formulate mechanisms for various coupling reactions and predict their applications in pharmaceuticals

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	2	2	3
CO2	2	3	2	3	3
CO3	3	2	3	3	3
CO4	2	3	3	2	2
CO5	3	3	3	3	2
AVERAGE	2.4	2.6	2.6	2.6	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORRELATION-0

SEMESTER III
CORE PAPER X
PHYSICAL CHEMISTRY III

Total Hrs:75

Course Code:176314

No. of Credits : 4

COURSE OBJECTIVES:

- To learn the concepts of quantum chemistry.
- To know the concept of electrochemistry.
- To understand the concept of statistical thermodynamics.
- To know the properties of polymers.
- To gain the knowledge of applications of phase rule.

COURSE OUTLINE:

UNIT- I Quantum Chemistry III 15hrs

Particle in one dimensional and three dimensional box- tunneling- Degeneracy – removal of degeneracy- Rigid rotator wave equation and solution, calculation of rotational constants and bond length, Harmonic oscillator, wave equation, anharmonicity, force constant and its significance, Angular momentum, spin coupling and spin orbit coupling.

UNIT- II Quantum Chemistry IV 15hrs

Approximation Method: Variation method and perturbation theory. Slater determinantal wave functions, Born – Oppenheimer approximation- LCAO- MO and VB treatments of hydrogen molecules. Huckel π -electron theory and its application to ethylene and butadiene.

UNIT-III Electrochemistry – III 15hrs

Electrode Kinetics: Butler Volmer equation for one electron transfer – The high and low over potential limits – significance of symmetry factor and equilibrium exchange current density – derivation of classical Nernst equation for equilibrium potential of an electrode.

Electrochemical systems of technological interest: Corrosion and stability of metals – theories of corrosion – corrosion current – corrosion potentials – Evan's diagram – Pourbaix diagram – prevention of corrosion – electronic approach to stability of metals. **15hrs**

UNIT-IV Statistical thermodynamics & Irreversible Thermodynamics 15hrs

Objective of Statistical thermodynamics - Distinguishable, indistinguishable particles ensemble and interactive systems - Micro and microstates - Maxwell - Boltzmann, Bose-Einstein, and Fermi-Dirac Statistics and their respective distribution functions.

Partition function: Evaluation of translational, Vibrational and rotational partition functions for mono, diatomic molecules - calculation of thermodynamic functions – U, H, S and G - equilibrium constant and heat capacities from partition functions.

UNIT-V Phase equilibria & Polymer Science

15hrs

Application of phase rule to Fe-C system Three component system - Roozeboom plots acetic acid - chloroform - water system - plait point - System involving two solids and a liquid NaCl - Na₂SO₄ - H₂O system.

Properties of polymers - Glass Transition temperature - factors influencing the Glass Transition temperature- crystallinity in polymers - degree of crystallinity - effect of crystallinity in the properties of polymers. Molecular weight and size distribution of polymers, Number average and weight average molecular weight, degree of polymerisation Determination of molecular weight of polymers Osmometry, Viscometry, Gel permeation chromatography. Electro polymerisation & Photo polymerisation.

RECOMMENDED TEXTBOOKS:

1. D.A.Mcquarrie-Quantum Chemistry.
2. R.K.Prasad - Quantum chemistry.

REFERENCE BOOKS:

1. Ira Levine - Quantum chemistry.
2. S.Glasstone - Thermodynamics for chemists.
3. J.Rajaram and J.C.Kuriacose Thermodynamics.
4. Polymer Chemistry by Ahluwalia.
5. Polymer Chemistry by Gowarikar.

JOURNALS:

1. Baer, Michael; Englman, Robert, A modified Born-Oppenheimer equation: application to conical intersections and other types of singularities". Chemical Physics Letters. 1997, 265, 105–108.
2. Moore, J.C. Gel permeation chromatography. A new method for molecular weight distribution of high polymers. J. Polym. Sci., 1964, 2, 835-843.

E-LEARNING RESOURCES:

1. https://chem.libretexts.org/Courses/Mount_Royal_University/Chem_1201/Unit_1%3A_A_Quantum_Chemistry
2. [https://chem.libretexts.org/Bookshelves/Analytical_Chemistry/Supplemental_Modules_\(Analytical_Chemistry\)/Electrochemistry](https://chem.libretexts.org/Bookshelves/Analytical_Chemistry/Supplemental_Modules_(Analytical_Chemistry)/Electrochemistry)
3. <https://www.britannica.com/science/polymer>

COURSE OUTCOMES

CO Number	Course statement
Unit 1	The particle in one dimensional box, three dimensional box and harmonic oscillator are discussed.
Unit 2	Comparing the LCAO-MO and VB treatment of hydrogen molecules.
Unit 3	The prevention of corrosion methods are discussed.
Unit 4	Understanding the uses of statistical thermodynamics.
Unit 5	Determination of molecular weight of the polymers are learned.

MAPPING-COURSES OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
Unit 1	1	2	3	2	2
Unit 2	2	1	3	2	2
Unit 3	3	2	2	2	3
Unit 4	2	3	1	2	2
Unit 5	2	3	3	2	1
AVERAGE	2	2.2	2.4	2	2

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1 NO CORELATION-0

SEMESTER III

MAJOR ELECTIVE PAPER IV

ENVIRONMENTAL CHEMISTRY

Total Hrs:60

Course Code: 176315

No. of Credits : 3

COURSE OBJECTIVES:

- To impart knowledge on natural cycles and toxicology
- To create an awareness on different environmental pollutions
- To identify air and water monitoring techniques
- To design waste management and recycling process
- To explain the various instruments and techniques involved in analysis of pollutants

COURSE OUTLINE:

UNIT- I Natural cycles and chemical toxicology

12 hrs

Endogenic and exogenic cycles - hydrological cycles – carbon cycle - oxygen cycle - nitrogen cycle - phosphorous cycle - sulphur cycle.

Toxic chemicals in the environment - biochemical effects of trace elements - Ar, Pb, Cd, Cr, Hg, Mn, Sb, Be, Co, Cu, Zn, Se, CN, F-Carcinogens.

UNIT- II Pollution

12 hrs

Air pollution- Green house effect – ozone layer depletion - photochemical smog - effect of pollutants on human beings and animals (CO, SO₂, (NO)_x, HF)- Causes - automobiles and industries - methods and equipments used for controlling particulate emission.

Water pollution - types of pollutants - organic and inorganic - acid rain – eutrophication - effect of pollutants on human beings and animals - alkalinity and acidity - chloride, fluoride, cyanide, sulphate, nitrate, nitrite, sulphide.

Soil pollution - effect of pollutants on human beings and animals - pesticides, insecticides, fungicides, herbicides, algicides, rodenticides.

Radioactive pollution - pollutants.

E-waste awareness.

UNIT -III Monitoring techniques and methodology

12hrs

Air monitoring-atmospheric sampling and analysis-techniques – gravity, filtration, precipitation-absorption, adsorption and great sampling. Estimation of atmospheric pollutants-Dust fall jar-determination of suspended particles with a high volume sampler - determination of sulphation rate - estimation of hydrogen sulphide and sulphur dioxide-analysis of hydrocarbons(brief idea)

Air quality standard in India(SO₂, (NO)_x, CO)

Water monitoring - water quality parameters and standard - oxygen demand-BOD, COD -method Winkler, membrane electrode method.

UNIT- IV Waste management and recycling

12 hrs

Waste management and recycling - classification of waste - waste water treatment – preliminary – primary – sedimentation – coagulation – secondary – aerobic - trickling filters -activated sludge - anerobic.

Solid waste disposal - solid waste management by biotechnology - municipal solid waste -sanitary land fill, composting, vermicomposting, incineration, e-waste management.

Radioactive waste – disposal – methods - reprocessing of spent fuel - ocean dumping.

Polymer recycling - use of virgin plastics.

UNIT- V Instrumental techniques in environmental chemical analysis

12hrs

Neutron activation analysis-anodic stripping voltametry - atomic absorption spectrometry - inductively coupled plasma emission spectroscopy - X-ray fluorescence - nondispersive infrared spectrometry - fourier transform infrared spectroscopy, chemiluminescence - gas chromatography, high performance liquid chromatography - ion selective electrode - ion chromatography.

RECOMMENDED TEXTBOOKS:

1. Jadhav HV (1992) Elements of Environmental Chemistry, APT Books Inc., SA.
2. Banerjee SK (2005) Environmental Chemistry, 2nd edition, Prentice-Hall of India, New Delhi.
3. De AK (2003) Environmental Chemistry, 5th edition, New Age International (P) Ltd, New Delhi.
4. Sharma BK (2000) Environmental Chemistry, Goel Publishing House, Meerut.
5. Moore JW and Moore EA (1976) Environmental Chemistry, Academic Press, USA.
6. Dara SS (2005) A Text Book of Environmental Chemistry and Pollution Control, S. Chand & Company, New Delhi.
7. Balram Pani (2007) Text book of Environmental Chemistry, IK international Pvt. Ltd, New Delhi
8. Rao CS (1993) Environmental Pollution Control, Wiley Eastern Ltd., New Delhi.
9. Environmental Chemistry - Koushik & Koushik

REFERENCE BOOKS:

1. Khopkar SM (1993) Environmental Pollution Analysis, John Wiley & Sons, NY, USA.
2. Manahan SE (2009) Environmental chemistry, CRC Press, FL, USA.
3. Satake M, MS, Sethi, SA. Iqbal, Y. Mido. (2004) Environmental Chemistry, Discovery Publishing House, New Delhi.
4. Sharma BK and Kaur H (2000) Environmental Chemistry, Goel Publishing, New Delhi.
5. Tchobanglous and F.Kreith (2002) Handbook of Solid Waste Management, 2nd edition, McGraw Hill Company.
6. Manahan SE (2007) Environmental Chemistry, 7th edition, Lewis Publications, Florida, USA
7. Khopkar SM (1993) Environmental Pollution analysis, Wiley Eastern Ltd.
8. Skoog DA, Holler FJ and Nieman TA (1980) Principles of Instrumental Analysis – 5th edition, Thomson Asia Pvt., Singapore,
9. Vogel AI (1998) Quantitative Analysis, 6th edition, Prentice Hall Inc.,
10. Baird C and Cann M (2008) Environmental Chemistry. W.H. Freeman and Company.

JOURNALS:

1. International Journal of environmental science and technology - Springer
2. Journal of hazardous materials – Elsevier
3. Journal of environmental and analytical toxicology - OMICS
4. Journal of environmental studies and sciences - Springer
5. International journal of environmental studies – Taylor a& Francis
6. Environmental toxicology and chemistry - Wiley

- **E-LEARNING RESOURCES**

UNIT	E – LINKS
I	https://www.britannica.com/science/biogeochemical-cycle https://en.wikipedia.org/wiki/Environmental_toxicology https://www.intechopen.com/books/poisoning-in-the-modern-world-new-tricks-for-an-old-dog-/mechanism-and-health-effects-of-heavy-metal-toxicity-in-humans
II	https://en.wikipedia.org/wiki/Pollution https://www.livescience.com/22728-pollution-facts.html https://en.wikipedia.org/wiki/Air_pollution https://en.wikipedia.org/wiki/Water_pollution https://www.environmentalpollutioncenters.org/soil/ https://www.toppr.com/guides/chemistry/environmental-chemistry/soil-pollution/ https://www.environmentalpollutioncenters.org/radiation/ https://en.wikipedia.org/wiki/Radioactive_contamination http://greene.gov.in/ http://www.pacebutler.com/blog/e-waste-awareness/ https://en.wikipedia.org/wiki/Electronic_waste
III	https://www.epa.gov/air-research/air-monitoring-measuring-and-emissions-research https://en.wikipedia.org/wiki/National_Ambient_Air_Quality_Standards http://www.arthapedia.in/index.php?title=Ambient_Air_Quality_Standards_in_India https://www.who.int/water_sanitation_health/publications/wqmonitor/en/ https://www.who.int/water_sanitation_health/publications/wqmonitor/en/ https://www.env.go.jp/earth/coop/coop/document/apctm_e/01-apctme-09.pdf
IV	https://www.norcalcompactors.net/about-waste-management-and-recycling-solutions/ https://en.wikipedia.org/wiki/Wastewater_treatment https://www.britannica.com/technology/solid-waste-management/Solid-waste-collection https://en.wikipedia.org/wiki/Radioactive_waste https://en.wikipedia.org/wiki/Plastic_recycling https://www.pnas.org/content/pnas/89/3/835.full.pdf https://chem.libretexts.org/Bookshelves/Organic_Chemistry/Supplemental_Modules_(Organic_Chemistry)/Polymers/Recycling_and_Disposal_of_Polymers
V	http://webhost.bridgew.edu/c2king/CH489/Lec%204B_Enviro%20Chem%20Anal2_Mod.pdf https://www.youtube.com/watch?v=RYcYDg1xi6E https://web.njit.edu/~kebbekus/book.htm

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Explained natural cycles and discussed biochemical effects of toxic chemicals
CO 2	Critique on air, water, soil, radioactive pollutions and awareness on e-waste
CO 3	Demonstration on air & water monitoring and analysed their quality standards
CO 4	Designed on waste management and recycling processes
CO 5	Evaluated environmental chemicals by various Instrumental techniques

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	1	3	3
CO2	3	3	2	3	3
CO3	2	3	3	3	3
CO4	1	3	3	3	3
CO5	1	3	3	3	3
AVERAGE	2	3	2	3	3

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER III
EXTRA DISCIPLINARY ELECTIVE II
INDUSTRIAL CHEMISTRY

Total hrs: 45

Course Code:176316

No. of Credits : 3

COURSE OBJECTIVES:

To provide basic knowledge about Cement manufacture.

To give sound knowledge on new materials like polymer composites.

Students evaluate the application of pesticides and soil.

To know about paper pulp and its uses.

To know about the flavours and perfumes.

COURSE OUTCOME

UNIT-I (9
Hours)

Cement

Definition, Types of cement – Portland cement, High alumina cement, Water proof cement, Slag cement, Acid resisting cement, White cement, Coloured cement. Raw materials – Manufacture of Portland cement, Concrete – Curing and decay. Gypsum and Plaster of paris .

UNIT-II (9 Hours)

Polymer composite

Composites – Necessity of composites , Role of matrix in composites – Matrix materials, reinforcements– Types of composites – Application of fibre composites – Smart composites – Functional sensor materials.

UNIT-III (9 Hours)

Agricultural chemistry

3.1 Soil - Definition, Properties – pH, Texture, Acidity, Alkalinity, Soil water, Soil minerals, Soil fertility.

3.2 Pesticides- Pest control methods – Mechanical, Biological, Environmental and Chemical. Pest control methods using chemicals – Sprays, Dust, Fumings, Aerosols and internal

applications. Biological magnification – Biodegradation of pesticides, mode of poisoning, Benefits of pesticides, Environmental effects of pesticides.

UNIT-IV

(9 Hours)

Pulp and Paper

Introduction , Manufacture of Pulp, Types of pulp – Sulphate or Craft pulp, Soda pulp, Rag pulp. Beating, Refining, Filling, Sizing and Colouring. Manufacture of Paper, Calendering, Important features of Pulp and Paper Industry.

UNIT-V

(9 Hours)

Chemistry in daily life

Preparations of Safety matches, Agarbathis, Napthalene balls, Wax candles, Shoe polish, Gum paste, Fountain pen ink, Chalk crayons, Perfumes – Production of natural perfumes, flower perfumes – Jasmine, Lily, Rose. Fruit flavours, Artificial flavours – Apple, Banana, Grape and Pie apple compounds.

Stains – Precautions in removal of stains, Removal of different Stains.

RECOMMENDED TEXTBOOKS:

1. Industrial chemistry, B. K. Sharma
2. A Textbook of Chemical Technology, Shukla S. D and Pandey G. N
3. Chemistry of Pesticides, N.K. Rao

REFERENCE BOOKS:

1. Introduction to Materials Management, by Steve Chapman, Ann K. Gatewood, Tony K. Arnold
2. Industrial Chemsitry, Loutfy H. Madkour
3. Ullmann's Encyclopaedia of Industrial Chemistry, W. Gerhartz
4. Advanced Polymer Composites: Principles and Applications (Pdl Handbook Series), Bor Z. Jang

JOURNALS:

1. Journal of Industrial and Engineering Chemistry

2. Industrial & Engineering Chemistry Research

3. <https://www.researchgate.net/publication>

4. Journal of Pesticide Science

5. European Journal of Soil Science

E-LEARNING RESOURCES

UNIT 1

<http://iti.northwestern.edu/cement/index.html>

<https://www.understanding-cement.com/manufacturing.html>

UNIT 2

<https://onlinelibrary.wiley.com/journal/15480569>

<https://www.sciencedirect.com/topics/materials-science/polymer-composite>

UNIT 3

<https://en.wikipedia.org/wiki/Pesticide>

npic.orst.edu > ingred > ptype

<https://www.toppr.com/guides/science/soil/soil-and-soil-profile/>

UNIT 4

https://en.wikipedia.org/wiki/Pulp_and_paper_industry

UNIT 5

<https://www.rsc.org/organic-chemistry-case-studies>

<https://en.wikipedia.org/wiki/Perfume>

Course outcomes

CO Number	CO STATEMENT

CO 1	To create awareness of construction materials like cements
CO 2	To analyze and explore new materials such as polymer composites.
CO 3	To apply the use of pesticides and soil for construction purpose
CO 4	Students know about paper and paper pulp
CO 5	To evaluate the importance of different flavours and perfumes

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	3	3
CO2	1	3	3	2	1
CO3	3	1	2	2	2
CO4	2	3	3	3	3
CO5	3	2	2	2	1
AVERAGE	2	3	2	2	3

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER IV
CORE PAPER XI
INORGANIC CHEMISTRY III

Total hrs:90

Course Code:176317

No. of Credits : 4

COURSE OBJECTIVES:

- To understand the knowledge of inorganic polymers.
- To know the concept behind boron hydrides and metal clusters.
- To gain fundamental knowledge of organometallic chemistry.
- To gain sound knowledge about material technology and its uses.
- To understand the concept of Lanthanides and Actinides.

COURSE OUTLINE:

UNIT- I : Inorganic Polymers

15hrs

1.1 Phosphorus based polymers-Polyphosphazines, polydimethoxy and polydiethoxy phosphazines, phosphate glasses, sulphur-phosphorus polymers, meta phosphate glasses, chalcogenide glasses.

1.2 Sulphur based polymers: polymeric sulphur, polymeric sulphur nitride

1.3 Silicon based polymers: Organosilicones-liquid polysiloxanes, high polymer organosiloxanes, silicone rubbers, silicon resins.

UNIT- II Boron Hydrides and Metal clusters

15hrs

Boranes: Classification of boranes and Carboranes-Nomenclature-Skeletal electron pair counting-Wade's rule-Structure and bonding in B_4H_{10} , B_5H_9 , B_6H_{10} , B_5H_{11} , $B_{10}H_{14}$, $B_6H_6^{2-}$ and $C_2B_{10}H_{12}$

Metal Clusters: Bonding and structures of clusters: Dinuclear clusters - $Mn(CO)_{10}$, $Fe_2(CO)_9$ and $[Re_2Cl_8]^{2-}$ Trinuclear Clusters - $Fe_3(CO)_{12}$, $Ru(CO)_{12}$, Re_3Cl_9 -Tetranuclear Clusters- $Rh_4(CO)_{12}$, $Ir_4(CO)_{12}$ -Hexanuclear clusters- $[Mo_6Cl_8]^{4+}$, $[Nb_6Cl_{12}]^{2+}$.

UNIT-III: Organometallic Chemistry

15hrs

Carbon donors: rule of thumb-Structure and bonding in carbonyls, nitrosyls, olefins, acetylenes, allyl systems and metallocenes.

Electrophilic and nucleophilic attack on ligands, carbonylation and decarboxylation, oxidative addition.

Catalysis – Hydrogenation of olefins (Wilkinson's catalyst), hydroformylation of olefins using cobalt or rhodium catalyst (Oxo process), oxidation of olefins to aldehydes and ketones (Wacker process); polymerization (Ziegler-Natta catalyst); Cyclo oligomerisation of acetylene using nickel catalyst (Reppe's catalyst).

UNIT - IV Material Technology

15hrs

Dielectric materials- piezo electricity- effect of temperature-Aerospace materials properties and applications(brief idea) – Composite materials any one preparation and uses- Chelates as light emitting diodes, polymer light emitting diodes, phosphorescent light emitting diodes, organic/polymer solar cells(only preliminary idea)

Magnetic properties of materials –classification paramagnetic, ferromagnetic, antiferromagnetic-Magnetic susceptibility- determination of magnetic susceptibility by Guoy balance.

UNIT - V Lanthanides and Actinides

15hrs

Lanthanides -Electronic configuration- Oxidation states-Separation of lanthanides-Chemical properties of +3 states-lanthanide contraction-Colour and spectra-magnetic property-Complexes, Lanthanide chelates.

Actinides-Electronic configuration-Later actinide elements-oxidation states- magnetic property-Extraction of Thorium.

RECOMMENDED TEXTBOOKS:

- 1.J.E. Huheey, 1993, Inorganic Chemistry - Principles, Structure and Reactivity; IV Edition, Harper Collins, NY.
- 2.F.A. Cotton and G. Wilkinson, 1988, Advanced Inorganic Chemistry - A Comprehensive Text, V. Edition, John Wiley & Sons.

REFERENCE BOOKS:

1. K.F. Purcell and J.C. Kotz, 1977, Inorganic Chemistry - WB Saunders Co., USA.
2. M.C. Day and J. Selbin, 1974, Theoretical Inorganic Chemistry, Van Nostrand Co., NY.
3. U.Malik, G.D.Tuli and R.D. Madan 1992 Selected Topics in Inorganic chemistry
4. N.N. Greenwood and Earnshaw, 1984, Chemistry of the Elements, Pergamon Press,

5. S.S.Dara. Industrial chemistry

JOURNALS:

1. <https://pubs.acs.org/>
2. https://www.mdpi.com/journal/molecules/special_issues/lanthanide

E-LEARNING RESOURCES:

1. <https://doi.org/10.1021/ed053p629>
2. https://www.mdpi.com/journal/inorganics/special_issues/bonding_actinide_lanthanide_complexes
3. http://scholar.google.co.in/scholar?q=inorganic+polymers+e++journals&hl=en&as_sdt=0&as_vis=1&oi=scholar
4. <https://link.springer.com/journal/10904>
5. <https://onlinelibrary.wiley.com/doi/abs/10.1002/jctb.5010120806>

COURSE OUTCOMES:

CO Number	CO STATEMENT
Unit 1	Create the knowledge of inorganic polymers.
Unit 2	Explain the concept behind boron hydrides and metal clusters.
Unit 3	Compile the knowledge of organometallic chemistry.
Unit 4	Explain knowledge about material technology and its uses.
Unit 5	Compare the concept of Lanthanides and Actinides.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
Unit 1	2	1	1	2	3
Unit 2	2	1	3	2	1

Unit 3	1	3	1	3	3
Unit 4	2	3	2	2	2
Unit 5	3	2	3	1	1
AVERAGE	2	2	2	2	2

SEMESTER IV

CORE PAPER XII

CHEMISTRY OF NATURAL PRODUCTS

Total Hrs: 90

Course Code: 176318

No. of Credits :4

COURSE OBJECTIVES:

- To know the classification, biological role, structure and properties of Carbohydrates
- To learn the synthesis, properties of vitamins and structural determination of natural Pigments.
- To gain the knowledge of bio synthesis, functions and analysis of Proteins.

- To understand the classification, chemical properties, synthesis and bio functions of Lipids.
- To know more about the classification and structural elucidation of Alkaloid and Terpenes.

COURSE OUTLINE:

UNIT I

15hrs

CARBOHYDRATES

Definition, classification and biological role of carbohydrates-Monosaccharides linear and ring structures (Haworth formula) of ribose and mannose(structural determination not required).Disaccharides: Ring structure (Haworth formula) –occurrence, physical and chemical properties of - sucrose, maltose and lactose. Polysaccharides –structure and properties of cellulose and starch. Glycolysis of carbohydrates.

UNIT II

15hrs

VITAMINS AND PIGMENTS

Synthesis of carotenoids, Vitamin A 1 (Reformatsky and Wittig reaction only).Chemical characteristics of Vitamin A. Biological functions of Vitamin A, D, E, K, B.

Natural pigments:Anthocyanins- general methods of determining structure and synthesis-cyanin and hirsutin chlorides. Flavones and flavanols- general method of determining structure and synthesis- quercetin- isoflavones- daidezin.

UNIT III

15hrs

PROTEINS

Peptides and their synthesis - synthesis of tripeptide. Merrifield resin synthesis, Determination of primary, secondary and tertiary and quaternary structure of proteins, Bio-synthesis of proteins. Analysis of proteins determination of moisture content, ash content, nitrogen content, Kjeldhal method. Biological Functions of proteins, deamination, transamination reactions, urea cycle..Physiological and metabolic roles of proteins.

UNIT IV

15hrs

LIPIDS

Lipids – definition – classification - simple lipids – fats and oils – compound lipids – phospholipids, glycolipids –general properties of lipids, biological functions of lipids – metabolic function - digestion, absorption, metabolism of lipids. Lipid in blood.

Biosynthesis of fatty acids. Biosynthesis of triglycerides and phospholipids.

Cholesterol (structural elucidation not needed), biological importance and chemical properties, Bile acids – function.

UNIT V

15hrs

ALKALOIDS

Classification, synthesis and structural elucidation by chemical degradation, synthesis of papaverine, quinine, morphine and reserpine. Terpenes : classification, synthesis and structural elucidation by chemical degradation and synthesis of alpha pinene, camphor, zingiberine, santonin , beta carotene.

RECOMMENDED TEXTBOOKS:

1. Natural products: Chemistry and Applications. Sujata.V. Bhat, B.A. Nagasampagi, S. Meenakshi.
2. Chemistry of Natural Products: O.P. Agarwal.

REFERENCE BOOKS:

1. Food Chemistry : Alex. V. Ramani
2. Outlines of Biochemistry V Edition by Eric E. Conn, Paul. R. Stumpf, George Bruening and Roy H. Dole, John Wiley and Sons.
3. J. L. Jain, Fundamentals of Biochemistry; S. Chand and Co., New Delhi, 2007
4. Introduction to Alkaloids by G.A. Swan
5. Advanced Organic Chemistry by Francis A. Carey and Richard J. Sundberg, Plenum Press, New York.

JOURNALS:

1. Indian Journal of natural products and resources.
2. International journal of natural products science.
3. Journal of Asian natural products research.
4. Journal of natural product and plant resources.

E-LEARNING RESOURCES:

<https://www.healthline.com>
<https://www.hindawi.com>
<http://www.hsph.harvard.edu>
<https://www.ncbi.nlm.nih.gov>
<https://www.mdpi.com>
<https://www.sciencedirect.com>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	To identify the various classes of Carbohydrates.
CO 2	To compare the Natural Pigments.
CO 3	Used to know the functions of Proteins.
CO 4	Able to demonstrate the synthesis of Lipids.
CO 5	To analyse the structure of Alkaloids and Terpenes.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	2	2
CO2	2	2	3	3	1
CO3	2	3	2	1	3
CO4	1	2	1	2	3
CO5	2	1	1	2	1
AVERAGE	2	2	2	2	2

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

SEMESTER IV
CORE PAPER XIII
PRACTICALS – III (PHYSICAL)

Total Hrs:90

Course Code:176319

No. of Credits : 4

COURSE OBJECTIVES:

- To learn the concept of potentiometric titrations.
- To know the concepts of determination of molecular weight.
- To understand the construction of phase diagram for a simple binary system.
- To verify the concepts and equations in physical chemistry by carryout suitable experiments.
- To learn the operation of instruments and data processing. A minimum nine experiments have to be performed.

COURSE OUTLINE:

1. Heat of Solution from Solubility
2. Determination of molecular weight from freezing point depression.
3. Distribution coefficient for the distribution of I_2 between CCl_4 and H_2O determination of equilibrium constant of the reaction $KI + I_2 \leftrightarrow KI_3$
4. Adsorption isotherm-Study of the adsorption of acetic acid or oxalic acid on charcoal, verification of Freundlich isotherm and determination of concentration of given acetic acid or oxalic acid.
5. Construction of phase diagram for a simple binary system forming Eutectic mixture; naphthalene – biphenyl, naphthalene – p-dichlorobenzene, naphthalene-diphenylamine.
6. Potentiometric Acid base titrations. Determination of pH and pK_a values using quinhydrone electrode.
7. Potentiometric redox titrations
8. Determination of the strengths of the given two weak acids by conductivity method

9. Conductometry-Precipitation titrations
10. The determination of partition coefficient and degree of association of benzoic acid in benzene using partition method.
11. Comparison of strengths of two acids by polarimetry-inversion of sucrose
12. Determination of K_a and K_b of a weak acid or a weak base by conductometry method.
13. Determination of the rate constant and order for the reaction between potassium persulphate and potassium iodide.

RECOMMENDED TEXTBOOKS:

1. Physical Chemistry Laboratory manual Branch IV Chemistry compiled by Dr.B.Viswanathan, Dr.V.R.Vijayaraghavan, Dr.T.Sundaravelu, Dr.KamalaGovindarajan, Dr.S.Vivekanandan and Dr.V.Kannappan Centre for Science Education School of Chemistry, University of Madras.
2. V. Venkatesan, R. Veeraswamy, A.R. Kulandaivelu, Basic Principles of Practical Chemistry, S.Chand and Sons, 2004.

REFERENCE BOOKS:

1. Practical Chemistry-2005 by O.P. Pandey, D.N. Bajpai and S. Giri
2. Practicals in Physical Chemistry Paperback – 2009, Macmillan, by P.S. Sindhu.
3. Physical Chemistry Practical Paper back –2012, NCBA, by Saroj Kumar Maity, Naba Kumar Ghosh.
4. A Manual of Practical Physical Chemistry Hardcover – 2015 by Francis William Gray.
5. Practical Chemistry B.Sc 1, 2 and 3rd Paperback – 2010 by O.P. Pandey, D.N. Bajpai and Dr. S. Giri

JOURNALS:

1. Heats of Solution from Solubility Determinations, Attilio Cesaro and Elio Russo, Journal of Chemical Education, 1978, 55, 133-134.
2. Precipitation titrations in terms of the Pourbaix diagram G. F. Atkinson J. Chem. Educ. 1977, 54, 109.

COURSE OUTCOMES

CO	Course statement
	The safety requirements and lab skills to perform experiments are explained.
	Comparing the potentiometric and conductometry titrations.
	The concepts of rate constant, order of the reaction and calculations are explained.
	How to keep the records of instruments, parameters and experimental observations are discussed
	Evaluate the reporting of experimental results.

MAPPING-COURSES OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
Unit 1	1	2	3	2	3
Unit 2	2	3	2	2	2
Unit 3	2	2	3	1	3
Unit 4	3	2	1	2	3
Unit 5	3	1	2	3	2
AVERAGE	2.2	2.0	2.2	2.0	2.6

Key: strongly correlated-3, moderately correlated -2, weakly correlated -1, No correlation-0

SEMESTER IV

CORE PAPER XIV

Total Hrs:90

Course Code:176320

No. of Credits : 4

PRACTICALS-IV (INORGANIC II)

COURSE OBJECTIVES:

- To train students in inorganic complex preparation
- To separate metal ions from mixture
- To detect metal ions
- To identify cations by semimicro method

COURSE OUTLINE:

I Inorganic Preparations (Any five from the following)

1. Preparation of potassium tris(oxalate)chromate(III)trihydrate
2. Hexamminenickel (II) Chloride
3. Thiourea complexes of copper (I)/copper II
4. Bis (acetylacetonato) copper (II)
5. Potassium tris (oxalato) aluminate (III) trihydrate
6. Tetramminecopper (II) Sulphate
7. Preparation of microcosmic salt.

II Semi micro qualitative analysis

Semi micro qualitative analysis of mixtures containing two common and two rare cations. The following are the rare cations to be included: W, Mo, Ti, Te, Se, Ce, Th, Zr, V, U and Li.

RECOMMENDED TEXTBOOKS:

1. Inorganic semimicro qualitative analysis, V.V. Ramanujam, The National publishing company, Ed:3, 2007
2. V. Venkatesan, R. Veeraswamy, A.R. Kulandaivelu, Basic Principles of Practical Chemistry, S.Chand and Sons, 2004.

REFERENCE BOOKS:

1. Vogel AI (1998) Quantitative Analysis, 6th edition, Prentice Hall Inc.,

E-LEARNING RESOURCES:

UNIT	E links
I	http://ncert.nic.in/ncerts/l/lelm107.pdf
II	https://docs.google.com/document/d/1cFxfpv4tNzARY2g8SVjQtAGPEp5Z7zrFj03G9ENa9aQ/edit

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Prepared inorganic complexes
CO 2	Identified more & less common cations in a mixture by using semi micro qualitative analysis

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	1	2	1	3	3
CO2	1	2	2	3	3
AVERAGE	1	2	2	3	3

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER IV

CORE PAPER XV

Course Code:

176321

No of Credits: 4

INDIVIDUAL PROJECT

To plan and design, retrieve relevant literature, organize and conduct, process the data, record the observations and interpret. The work shall either be conducted in the department under the guidance of the project supervisor or in other institutions or with interdisciplinary collaborations from external departments or institutions.

SEMESTER IV
MAJOR ELECTIVE PAPER V
GREEN CHEMISTRY

Total Hrs:75

Course Code:176321

No. of Credits : 3

COURSE OBJECTIVES:

- Awareness-need-green synthesis-designing-principles

- Understands the fundamentals of green synthesis
- Acquires a sound knowledge of renewable resources
- Will be familiar with alternative energy resources
- Design methods to reduce hazardous solvents.

COURSE OUTLINE:

UNIT I Green Chemistry Principles

15 hrs

The need for green chemistry and eco-efficiency, challenges and green chemistry, pollution control and pollution prevention, green methods, green products, recycling of waste. Twelve principles of green chemistry, inception of green chemistry, awards for green chemistry and international organizations promoting green chemistry.

UNIT II Measuring and controlling environmental performances

15 hrs

Importance of measurement-lactic acid production-safer gasoline-introduction to life cycle assessment-four stages of life cycle assessment (LCA) – carbon footprinting – green processes matrix – ecolabels – integrated pollution prevention and control.

UNIT III Emerging Green technology and alternative energy sources

15 hrs

Design for energy efficiency- photochemical reactions – advantages-challenge faced by photochemical process. Microwave technology on chemistry-microwave heating-microwave assisted reactions-sonochemistry and green chemistry-electrochemical synthesis with examples

UNIT IV Designing Green Synthesis

15 hrs

Designing Green synthesis – choice of starting materials, choice of reagents, choice of catalysts-biocatalysts, polymer supported catalysts, (examples) choice of solvents.

UNIT V Renewable resources

15 hrs

Biomass-renewable energy-fossil fuels, energy from biomass-solar power-other forms of renewable energy-fuel cells-alternative economics-syn gas economy-hydrogen economy-biorefinery chemicals from fatty acids-polymers from renewable resources.

RECOMMENDED TEXTBOOKS:

1. V K Ahluwalia, Methods and reagents of Green Chemistry: an introduction by green chemistry www.clri.org
2. Protti D Dondi et al., Green Chemistry

3. Tools for green chemistry – Evan S. Beach – Wiley VCH.

REFERENCE BOOKS

1. C.J. Li, T.H. Chan, Comprehensive reactions in aqueous media, Wiley 2nd Ed, 2007
2. B. Kirchner, Topics in Current Chemistry, Springer, 290, 2010.
3. M. Larhed, K. Olofsson, Topics in Current Chemistry Springer, 266, 2006
4. Rashmi Sanghi, M.M. Srivastava, Green Chemistry, Environment Friendly Alternatives, Narosa Publishing House, 2007.
5. Green chemistry an introductory text - Mike Lancaster – RSC.

JOURNALS

1. Environment science pollution research Int. 2004;11(5):284-90
2. Acc. chem. res 2002 sep ; 35(9):686-94

E-LEARNING RESOURCES :

UNIT	E links
1	https://www.epa.gov/greenchem/basics
2	https://www.ncbi.nlm.nih.gov/pubmed
3	http://communities.acs.org/thread
4	http://web.njit.edu/nutra/green/green_chemistry/green_chemistry
5	https://www.organic-chemistry.org/topics/green-chemistry.shtm

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Reduction of chemical pollutants flowing to environment.
CO 2	The use of renewable materials and energy sources.
CO 3	The use of safe, environmentally friendly substances, including solvents.
CO 4	Avoiding the production of waste – ideal form of waste management.
CO 5	To use catalytic reagents that can be used in small quantities to repeat a reaction.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	2	2
CO2	2	2	3	3	1
CO3	2	3	2	1	3
CO4	1	2	1	2	3
CO5	2	1	1	2	1
AVERAGE	2	2	2	2	2

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

**QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMEN, (AUTONOMOUS)
CHENNAI-600002**

CHEMISTRY

NAME OF THE DEPARTMENT

M.SC CHEMISTRY SYLLABUS

COLLEGE LOGO

CHOICE BASED CREDIT SYSTEM

OUTCOME BASED EDUCATION

(OFFERED FROM THE ACADEMIC YEAR 2018-19)

PROGRAMME SPECIFIC OUTCOME (PSOs)

PG

- To give students a comprehensive understanding of the principles of Chemistry.
- To gain the skill to design and carry out scientific experiments and interpret the data .

- To understand the interdisciplinary nature of Chemistry and to be aware of the emerging fields in Chemistry
- To build a scientific temper and to learn the necessary skills to succeed in research and industrial field.
- To be able to define and resolve new problems in Chemistry and participate in the future development of Chemistry

QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMEN

(Autonomous)

**Anna Salai, Chennai – 600 002.
Affiliated to University of Madras**

DEPARTMENT OF CHEMISTRY

B.Sc. CHEMISTRY

SYLLABUS



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

(OFFERED FROM THE ACADEMIC YEAR 2017-18)

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- 15. Rules and Regulations
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- 25. Course profile Semester IV
- 26. Course Profile Semester V
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- 28. Courses outlines

RULES AND REGULATIONS
Quaid-E-Millath Government College for Women (Autonomous),
Chennai – 600 002.

B.Sc., CHEMISTRY SYLLABUS

Choice Based Credit System

Quaid-E-Millath Government College for Women (Autonomous), offers the Semester System of Education with credits for UG courses. Credit simply means the weightage given to what is taught and what is learnt. It is normally related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures / tutorials / laboratory work / seminar / project work / practical training / viva voce etc to facilitate effective teaching and learning and the credits are assigned accordingly, depending on the content and the specialization.

The minimum credit requirement for a three – year UG course shall be 140 inclusive of Part IV and Part V.

REGULATIONS

1. Duration

- a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semester, the second academic year, the third and fourth semesters and the third academic year, the fifth and sixth semester.

- b. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year.

2. Course of Study

The course of study for Bachelor Degree Courses shall comprise of the following:

Foundation Courses: The courses shall comprise the study of:

- Part - I Tamil - 6 Credits for B.A. and B.Sc.; 4 Credits for B.Com.
- Part – II English – 6 Credits for B.A and B.Sc.; 4 Credits for B.Com.

Part III:

- Core Subjects (B.A.-79 Credits;B.Sc. - 79 Credits and 91 Credits– B.Com.)
- Allied Subjects (20 Credits for B.A., B.Sc., and B.Com.)

Part IV:

- Soft Skill (4 Papers) (8 Credits)
- Non-Major Elective (2 Papers) (4 Credits)
- Environmental Studies (2 Credits)
- Value Education (2 Credits)

Part V:

Extension Activities (1 Credit)

3. Compulsory Extension Service

A candidate shall be awarded a maximum of one credit for Compulsory Extension Service. All students shall have to enroll for NSS/NCC/Sports and Games/Rotary/Youth Red Cross or any other service organization in the College and shall have to put in compulsory attendance of 40 hours, which shall be duly certified. If a student lacks 40 hours attendance in the First year, she shall have to compensate the same during the subsequent years.

Students who complete the minimum attendance of 40 hours in One year only will get credit and those who complete the attendance of 80 or more hours in Two years will get I credit.

4) a) DISTRIBUTION OF MARKS FOR CONTINUOUS ASSESSMENT:

(Theory)

Test			Best out of 3	Assignment/seminar/ Creative Presentation/ Assignment on Glossary			Model Exam(75) reduced to	Attendance	Total	Reduced to
1	2	3		1	2	3				
20	20	20	40	10	10	5	25	10	100	25

b) PATTERN OF QUESTION PAPER (MODEL & SEMESTER EXAMINATION)

PART-A (50 words): Answer 10 out of 12 Questions $10 \times 2 = 20$ marks

PART -B(200 words):Answer 5 out of 8 Questions $5 \times 5 = 25$ marks

PART-C(500 words):Answer 3 out of 5 Questions $3 \times 10 = 30$ marks

Total marks: = 75 marks

c) DISTRIBUTION OF MARKS FOR CONTINUOUS ASSESSMENT:

For Practicals

Test (Best out of three)	Model Examination	Record and Observation	Total	Total reduced to
30 marks	20 marks	50 marks	100 marks	25 marks

Break-up Details for Attendance

90% and above : 10 Marks

80% and above : 9 Marks

75% and above : 8 Marks

65% and above : 7 Marks (Eligible to write after paying condonation fee)

50% and above : 5 Marks (Eligible to write examination in the following semester after
Paying condonation fee)

Below 55% : Not eligible (NE)

PART IV

Distribution of CIA Marks:

Seminar / Presentation	Assignment / Term Paper	Written / Oral Test	Total
20	10	10	40

End Semester Examination : Theory Paper = 60 Marks – Duration 2.30 hours.

Question Paper Pattern : 10 x 6 Marks = 60 Marks (10 out of 15)

5. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTERS:

- (i) Candidates shall register their names for the First semester examination after the admission in the UG courses.
- (ii) Candidates shall be permitted to proceed from the First Semester upto the Final Semester irrespective of their failure in any of the Semester Examination subject to the condition that the candidates should register for all the arrear subjects of earlier semesters along with current (subject) Semester subjects.
- (iii) Candidates shall be eligible to proceed to the subsequent semester, only if they earn, sufficient attendance as prescribed therefore by the Syndicate from time to time. Provided in case of candidate earning less than 50% of attendance in any one of the semester due to any extraordinary circumstance such as medical grounds, such candidates who shall produce Medical Certificate issued by the Authorised Medical Attendant (AMA), duly certified by the Principal of the College, shall be permitted to proceed to the next semester and to complete the course of study. Such candidate shall have to repeat the missed semester by rejoining after completion of final semester of the course, after paying the fee for the break of study as prescribed by the University from time to time.

6. PASSING MINIMUM:

- e) There shall be no Passing Minimum for Internal.
- f) For External Examination, Passing Minimum shall be of 50% (Fifty Percentage) of the maximum marks prescribed for the paper.
- g) In the aggregate (External + Internal) the passing minimum shall be of 50% for each Paper/Practical.
- h) Grading shall be based on overall marks obtained (internal + external).

7. GRADING SYSTEM:

The term grading system indicates a Ten (10) Point Scale of evaluation of the performances of students in terms of marks obtained in the Internal and External Examination, grade points and letter grade.

GRADE	GRADE POINT	PERCENTAGE EQUIVALENT
`O' = Outstanding	9.00 – 10.00	90 – 100
`D+' = Excellent	8.00 – 8.90	80 – 89
`D' = Distinction	7.50 – 7.90	75 – 79
`A+' = Very Good	7.00 – 7.40	70 – 74
`A' = Good	6.00 – 6.90	60 – 69
`B' = Average	5.00 – 5.90	50 – 59
`U' = Re appear	4.00 – 4.90	40 – 49

The following method be adopted for allotting credit for UG/PG Courses offered in the affiliated colleges as per TANSCHÉ by this University

UG COURSES

The total credit allotted for **UG COURSES** is **minimum of 140 credits**

Sl. No	Paper	No. of Papers	Credits	Total Credits
1	Part-II Language	4 Papers	3 Credits	12
2	Part-II English	4 Papers	3 Credits	12
3	Part-III Core Subjects	13-15 Papers	4-5 Credits	60
	Allied Subjects	4 Papers	5 Credits	20
	Project / Electives with 3 courses	Project (Or)	15 Credits	15
		3 Papers	5 Credits	
4	Part-IV Non-Major Elective / Basic Tamil / Adv.Tamil	2 Papers	2 Credits	4
	Soft Skill	4 Papers	3 Credits	12
	Environmental Studies	1 Papers	2 Credits	2
	Value Education	1 Papers	2 Credits	2
5	Part-V Extension Activity		1 Credits	1
	Total			140

Paper on Environmental Studies (ES) shall be dealt by the respective core paper department; the aim of this course is to learn the major concepts of Environmental Studies in the context of Core subject and is assigned 2 credits.

Institutions are free to offer papers of their interest in all categories, Core Allied, NME.

PROGRAMME OUTCOMES

On completion of the Programme, the learner is able to:

11. Apply practical and mathematical skills in all aspects. goals
12. Identify quality knowledge of the subject
13. Utilise the subject knowledge and communication skills to appear for competitive exams
14. Acquire theoretical, practical and mathematical knowledge.
15. Analyse the basic computational skills

PROGRAMME SPECIFIC OUTCOMES (PSOs) –UG

On completion of the specific programme B.Sc.,Chemistry
the student will be able to:

- Understand the importance of the elements in the periodic table including their physical and chemical nature and role in the daily life.
- Understand the concepts of chemistry to inter- relate with other subjects like mathematics, physics, biological science etc.,
- It expands the knowledge, available opportunities related to chemistry in the government services in various fields.

Appreciate the central role of chemistry in our society and use this as a basis to establish ethical behavior in environmental issues and address key issues facing our society in energy, health and medicine.

- Able to explain why chemistry is an integral entity for addressing social, economic, and environmental problems.

RUBRICS FOR CONTINUOUS ASSESSMENT

S.No.	Component	Criteria
1	Assignment	Content Originality Presentation Schematic Representation Diagram Bibliography
2	Seminar	Organisation Subject Knowledge Visual Aids Confidence level Presentation Communication Language
3	Field Visit	Participation Preparation Attitude Leadership
4	Participation	Answering Questions Clearing Doubts Participating in Group Discussions Regular Attendance

From 2017 – 2018

Credits & Marks Consolidation – B.Sc

Subject Component	No. of Papers	Total Marks	Total Credits
Part I – Language	4	400	12
Part II – English	4	400	12
Total	8	800	24
Part III			
Core	15	1500	60
Elective	3	300	15
Allied – Maths/Zoo/Bot	5/6	500/600	20
Total	23/24	2300/2400	95
Part IV			
NME	2	200	4
Soft Skills	4	400	12
EVS	1	100	2
VE	1	100	2
Total	8	800	20
Part V			
Extension Activities			1
Grand Total	39/40	3900/4000	140

QUAID- E -MILLATH GOVERNMENT COLLEGE FOR WOMEN

(AUTONOMOUS). CHENNAI – 600 002

DEPARTMENT OF CHEMISTRY

It is resolved to pass the syllabi for six semesters for Under Graduate Course in Major Chemistry and Allied Chemistry (for Physics, Zoology, PB & PB and N & D) to be followed from 2017– 2018 onwards.

Sem No.	Core/Elective/ Allied	Title of the Paper	Subject Code
I	Core	General Chemistry –I	
	Core	General Chemistry – II	
	Allied	Allied Chemistry – I	
II	Core	General Chemistry – III	
	CorePractical-I	Practical – I Inorganic Qualitative Analysis and Preparation	
	Allied	Allied Chemistry – II	
		Allied Chemistry Practical	
III	Core	General Chemistry – IV	
	Core	General Chemistry – V	
IV	Core	General Chemistry – VI	
	CorePractical-II	Practical – II Volumetric Estimation	
V	Core	Inorganic Chemistry	
	Core	Organic Chemistry – I	
	Core	Physical Chemistry	
	Core	Analytical Chemistry	
	Elective I	Pharmaceutical Chemistry	
VI	Core	Organic Chemistry – II	
	Elective II	Electrochemistry and Photochemistry	
	Elective III	Instrumental methods of Analysis	
	CorePractical-III	Practical III: Physical Chemistry	
	CorePractical-IV	Practical IV : Gravimetric Estimation, Organic Analysis and Preparation	

Allied Chemistry

SEM	SUBJECT	SUB CODE	TITLE OF THE PAPER	LECT HRS.	CA	SE	TOTAL MARKS	CREDITS
I	Allied		PAPER I – Allied Chemistry – I	3	25	75	100	5
			Allied Chemistry Practical	3	25	75	100	-
II	Allied		PAPER II -Allied Chemistry - II	3	25	75	100	3
			Allied Chemistry Practical	3	25	75	100	2

PROGRAMME PROFILE B.Sc CHEMISTRY

SEM	PART	COMPONENT	COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS/	TOTAL	CA	SE	TOTAL

						WK	HOURS			
I	I	Tamil	173301	Tamil Paper I	3		60	25	75	100
	II	Language	173801	English Paper I	3			25	75	100
II	I	Tamil	173302	Tamil Paper II	3			25	75	100
	II	Language	178302	English Paper II	3			25	75	100
III	I	Tamil	173303	Tamil Paper III	3					
	II	Language	178303	English Paper III	3					
IV	I	Tamil	173304	Tamil Paper IV	3			25	75	100
	II	Language	178304	English Paper IV	3			25	75	100

B.SC., DEGREE COURSE

CHEMISTRY CHOICE BASED CREDIT SYSTEM –SEMESTER WISE PAPER DETAILS FOR
CANDIDATES ADMITTED FROM 2017-2018 ONWARDS

Sem	Part	Components	Code	Title of the paper	Hou rs/ WK	Total hrs	CA	SE	Total marks	Credits
I	III	Core 1	172301	General Chemistry I	5	75	25	75	100	4
	III	Core 2	172302	General Chemistry II	5	75	25	75	100	4
	III	Core		Practical I:Qualitative analysis	2	-	-	-	-	-
	III	Allied	172291	Physics I	3	45	25	75	100	5
	III	Allied		Practical :Physics	3	45	-	-	-	-
	IV	NME		Non major Elective I	2	20	-	-	-	2
	IV	Soft Skill		Paper I	2	20	-	-	-	3
II	III	Core 3	172303	General Chemistry III	6	90	25	75	100	4
	III	Core 4	172304	Practical I:Qualitative analysis	6	90	25	75	100	4
	III	Allied	172292	Physics II	3	45	25	75	100	3
	III	Allied		Practical :Physics	3	45	25	75	100	2
	IV	NME		Non major Elective II	2	20	-	-	-	2
	IV	Soft Skill		Paper II	2	20	-	-	-	3
III	III	Core 5	172305	General Chemistry IV	4	60	25	75	100	4
	III	Core 6	172306	General Chemistry V	4	60	25	75	100	4
	III	Core		Practical II:Volumetric analysis	2	-	-	-	-	-
	III	Allied		Maths I/ Botany I/ Zoology I	5/3	75	25	75	100	5
	III	Allied		Practical :Botany/Zoology	2	-	-	-	-	-
	IV	Soft Skill		Paper III	2		-	-	-	3
	IV	EVS		Environmental studies	1		-	-	-	-

IV	III	Core 7	172307	General Chemistry VI	5	75	25	75	100	4
	III	Core 8	172308	Practical II:Volumetric analysis	4	90	25	75	100	4
	III	Allied		MathsII/ Botany II/ Zoology II	5/3	75	25	75	100	5
	III	Allied		Practical:Botany/ Zoology	2	-	25	75	100	
	IV	Soft Skill		Paper IV	2	-	-	-	-	3
	IV	EVS		Environmental studies	2	45	-	-	-	2
	IV	EXTN		Extension Activities	-	-	-	-	-	1
	III	Core 9	172309	Inorganic Chemistry	4	60	25	75	100	4
V	III	Core 10	172310	Organic Chemistry-I	4	60	25	75	100	4
	III	Core 11	172311	Physical Chemistry	4	60	25	75	100	4
	III	Core 12	172312	Analytical Chemistry	4	60	25	75	100	4
	III	Core		Practical III : Physical Chemistry	4	-	-	-	-	-
	III	Core		Practical IV : Gravimetric Estimation,Organic Analysis and Preparation	4	-	-	-	-	-
	III	Elective I	172313	Pharmaceutical Chemistry(Elective I)	5	75	25	75	100	5
	IV	VE		Value education	1	-	-	-	-	-
	III	Core 13	172314	Organic Chemistry-II	6	90	25	75	100	4
VI	III	Elective II	172315	ElectroChemistry and Photochemistry (Elective II)	6	90	25	75	100	5
	III	Elective III	172316	Instrumental methods of Analysis (Elective III)	6	90	25	75	100	5
	III	Core 14	172317	Practical III : Physical Chemistry	4	60	25	75	100	4
	III	Core 15	172318	Practical IV : Gravimetric Estimation,Organic Analysis and Preparation	6	90	25	75	100	4
	IV	VE		Value education	2	45	-	-	-	2

Credits in Part III = 95 (Core - 60 + Elective -15 + Allied - 20)

Credits in Part IV = 20

Credits in Part V = 01

Credits in Language (Part I)	= 12
Credits in Language (Part II)	= 12
Total Credits	= 140

EVALUATION PATTERN FOR CONTINUOUS ASSESSMENT

INTERNAL VALUATION BY COURSE TEACHER/S

CA QUESTION PAPER PATTERN-UG

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-5X2 marks	50	10	25
K1, K 2	B-1/2x5marks	150	5	
K2, K 3	C-1/2x10 marks	300	10	

CA QUESTION PAPER PATTERN FOR PART IV

Knowledge Level	Section	Word Limit	Marks	Total
K 1, K2	A-5X10	350	50	50

PART IV

Distribution of CA Marks:

Seminar / Presentation	Assignment / Term Paper	Written / Oral Test	Total
20	10	10	40

End Semester Examination : Theory Paper = 60 Marks – Duration 2.30 hours.

Question Paper Pattern : 10 x 6 Marks = 60 Marks (10 out of 15)

RUBRICS FOR CONTINUOUS ASSESSMENT

S.No.	Component	Criteria
1	Assignment	Content Originality Presentation Schematic Representation Diagram Bibliography
2	Seminar	Organisation Subject Knowledge Visual Aids Confidence level Presentation Communication Language
3	Field Visit	Participation Preparation Attitude Leadership
4	Participation	Answering Questions Clearing Doubts Participating in Group Discussions Regular Attendance

END SEMESTER EVALUATION PATTERN THEORY PAPERS

SEMESTER I/II/III/IV/V/VI

PART I/II/III

SINGLE VALUATION BY EXTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARK : 30

PART IV

SINGLE VALUATION BY INTERNAL EXAMINER

WRITTEN TEST

MAXIMUM MARKS : 60

PASSING MARK : 24

PRACTICAL PAPERS

PART III

SEMESTER II /IV /VI

VALUATION BY EXTERNAL EXAMINER AND INTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARK : 30

SEMESTER I

GENERAL CHEMISTRY – I

Total Hrs: 75

Course Code: 172301

No. of Credits : 4

COURSE OBJECTIVES:

- To provide essential knowledge in the fundamental concepts of Ionic bond and various types of solvents.
- To gain sound knowledge about covalent bond and VSEPR theory.
- To provide wide exposure on IUPAC nomenclature of organic compound, basic concept of bonding in organic chemistry, alkanes and alkenes and to understand Quantum chemistry and Gaseous state.

COURSE OUTLINE

UNIT-I

15 hrs

1.1 Ionic Bond – Formation and general properties. Radius ratio rule and its limitations. Hydration energy and Lattice energy and their applications. Born- Haber cycle, example – Fajan's rule.

1.2 Types of solvents – Protic and aprotic solvents, aqueous and non aqueous solvents, liquid ammonia as a solvent.

UNIT-II

15 hrs

2.1 Covalent bond and VSEPR theory

Covalent bond and shapes of molecules: Formation of covalent bond and general properties, Valence bond theory, . Hybridization – sigma and pi bond, Octet rule, Sidgwick rule of maximum covalency - Partial ionic character of covalent bond and percentage of ionic character.

2.2 VSEPR theory and geometries of molecules: H₂O, NH₃, HF, CH₄, PCl₅, BF₃, IF₇, ClF₃, SF₆ and SF₄.

UNIT-III

15 hrs

3.1 IUPAC system of nomenclature for organic compounds – Alkanes, Alkenes, Alkynes, Cycloalkanes, with one functional group, two functional groups heterocyclic compounds of five and six membered rings. Furan, Pyrrole, Thiophene and Pyridine

3.2 Basic concepts of bonding in organic chemistry - Hybridization and geometry of molecules – Methane, Ethane, Ethylene, Acetylene and Benzene. Electron displacement effects – Inductive, Inductometric, Electrometric, Mesomeric, Resonance, Hyper conjugation and steric effects. Cleavage of bonds – Homolytic and heterolytic fission of Carbon – Carbon bond – Reaction intermediates – Carbocations, Carboanions and free radicals – their stability.

UNIT-IV

15 hrs

4.1 Alkanes – Mechanism of free radicals substitution in alkanes – initiation, propagation and termination

4.2 Alkenes – General methods of preparation, Properties of alkenes – Electrophilic and free radical addition – Addition reaction with Hydrogen, Halogens, Hydrogen halides (Markovnikoff ‘ s rule), Hydrogen bromide (Peroxide effect), Sulphuric acid, Water, Hydroboration, ozonolysis, Hydroxylation with pottassium permanganate, allylic substitution by N – bromosuccinimide (NBS).

UNIT-V

15 hrs

5.1 Quantum chemistry – Planck’s theory, Photo Electric effect, Compton effect, de – Broglie’s relationship, Heisenberg’s uncertainly principle, Schrodinger wave equation (no derivation), Significance of wave functions.

5.2 Gaseous state – Gas laws from the kinetic theory of gases. Transport properties – Viscosity – Thermal conductivity – Diffusion – Maxwell’s distribution of molecular velocities (No derivation) – Mean – RMS, Most probable velocity, Equipartition energy- Heat capacity – Molecular basis – Virial equation of state – Boyle’s temperature – Coefficient of compressibility and thermal expansion .

RECOMMENDED TEXT BOOKS

1.J.E. Huheey, 1993, Inorganic Chemistry - Principles, Structure and Reactivity; IV Edition, Harper Collins, NY.

2.J. March, Advanced Organic Chemistry, wileyInterscience, 2007.

REFERENCE BOOKS

1. K.F. Purcell and J.C. Kotz, 1977, Inorganic Chemistry - WB Saunders Co., USA.
2. U.Malik, G.D.Tuli and R.D. Madan 1992 Selected Topics in Inoganic chemistry
3. Organic Chemistry, Stanley. H. Pine, 5th Edition, Tata Mcgraw Hill.
4. Organic Chemistry, Morrison and Boyd, Prentice – Hall of India Pvt. Ltd.
5. R.K.Prasad - Quantum chemistry

JOURNALS

3. <https://doi.org/10.1021/ed074p776>
4. <https://onlinelibrary.wiley.com/journal/1097461x>

E-LEARNING RESOURCES:

1. <https://www.sciencedirect.com/topics/chemistry/ionic-bond>
2. <https://pubs.acs.org/doi/abs/10.1021/ed040p295>
3. <https://pubs.acs.org/doi/abs/10.1021/ja01355a027>

4. <https://pubs.er.usgs.gov/publication/70034984>
5. <https://onlinelibrary.wiley.com/journal/1097461x>

COURSE OUTCOMES:

CO Number	CO STATEMENT
Unit 1	Create the fundamental concepts of Ionic bond and various types of solvents.
Unit 2	Explain the concept behind covalent bond and VSEPR theory.
Unit 3	Compile the knowledge of IUPAC nomenclature of organic compound and basic concept of bonding in organic chemistry.
Unit 4	Explain knowledge about alkanes and alkenes.
Unit 5	Discuss the concept of Quantum chemistry and Gaseous state.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
Unit 1	3	2	1	3	2
Unit 2	1	1	3	2	2
Unit 3	2	3	1	2	3
Unit 4	1	2	2	2	2
Unit 5	3	2	3	1	1
AVERAGE	2	2	2	2	2

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER I

GENERAL CHEMISTRY - II

Total Hrs: 75

Course Code: 172302

No. of Credits : 4

COURSE OBJECTIVES

- Discussed the concept of configurations and periodicity of elements.
- Outlined the basic concepts of thermodynamics and polymerization.

- Explain the synthesis, properties and stability of Alkynes, Dienes, Cycloalkanes.

COURSE OUTLINE

UNIT-I

15 hrs

1.1 Electronic configurations of elements- Aufbau principle, Hund's rule and Pauli's exclusion principle – stability of half filled and completely filled orbitals – shapes of s, p, d and f orbitals. s, p, d and f block elements – Classification and characteristic properties.

1.2 Periodicity of Properties – Definition and periodicity of the following properties – atomic radii, ionic radii, ionization potential, electron affinity and electro negativity (no determination) Lanthanide contraction – inert pair effect, pseudo inert gas configurations.

UNIT-II

15 hrs

2.1 Principles of Inorganic Analysis

Principles of acid – base equilibria, common ion effect and solubility product and their applications in qualitative analysis. Reaction involved in the separation and identification of cations and anions in the analysis.

2.2 S-Block Elements – General group discussion of alkali and alkaline earth metals, Anomalous behaviour of Lithium and Beryllium, Diagonal relationship between Li and Mg, Be and Ag.

2.3 Alkaline Earth Metals – Be, Mg, Ca, Sr and Ba occurrence and comparative study of the elements, Oxides, Hydroxides, Halides, Sulphates and Carbonates. Exceptional property of Beryllium.

UNIT-III

15 hrs

3.1 Alkynes – Preparation and properties – Acidity of alkynes, Formation of acetylides, Addition of water with HgSO_4 catalyst, Addition of hydrogen halides and Halogens, Oxidation, ozonolysis and hydroboration

3.2 Dienes – Stability of dienes, Conjugated, Isolated and cumulative dienes – Stability and chemical reactivity – 1,2 and 1,4 additions – Diels Alder reactions. Synthesis of dienes – 1,3 butadiene, Isoprene and chloroprene.

UNIT – IV

15 hrs

4.1 Polymerization – Types of polymerization – Free radical, Cationic and Anionic polymerizations including mechanism of preparation of polymers – Addition polymers and condensation polymers with examples.

4.2 Cyclo alkanes – Preparation using Wurtz's reaction, Dieckmann's ring closure and reduction of aromatic hydrocarbons. Substitution and ring opening reactions. Baeyer's strain theory and theory of strainless rings.

UNIT – V

15 hrs

5.1 Thermodynamics – Definition and explanation of terms - Intensive and extensive properties – Types of systems – Thermodynamic process – Cyclic, Reversible, Irreversible, Isothermal and adiabatic.

5.2 Zeroth Law of Thermodynamics – Concept of Heat and Work.

5.3 First law of thermodynamics – Statement and equation, C_p and C_v relationship – Calculation of W , E and H for the expansion for ideal gas under reversible, Isothermal and adiabatic conditions, Joule's law, Joule – Thomson effect, Inversion temperature and its significance.

RECOMMENDED TEXT BOOKS

1. J.E. Huheey, 1993, Inorganic Chemistry - Principles, Structure and Reactivity; IV Edition, Harper Collins, NY.
2. J. March, Advanced Organic Chemistry, Wiley-Interscience, 2007. Inorganic Chemistry – P.L. Soni- Sultan Chand
3. Inorganic Chemistry - Puri and Sharma- Nagin
4. Inorganic Chemistry – Madan – S. Chand Principles of Organic Chemistry – A.K. Bansal – New Age
5. A Textbook of Organic Chemistry- A.K. Bansal – New Age
6. Organic Chemistry – I.L. Finar – volume I&II- Addison Wesley

REFERENCE BOOKS

1. Concise Inorganic Chemistry – J.D. Lee
2. Inorganic Chemistry – P.L. Soni- Sultan Chand
3. Inorganic Chemistry - Puri and Sharma- Nagin
4. Inorganic Chemistry – Madan – S. Chand
5. Advanced Inorganic Chemistry – Cotton and Wilkinson
6. d- block elements – Dr. S. Sundaram, Dr. S. Srinivasan
7. Selected topics in Inorganic Chemistry – Malik, Tuli, Madan
8. Advanced Inorganic Chemistry – Satyaprakash, Tuli Basu, Madan
9. Principles of Organic Chemistry – A.K. Bansal – New Age
10. A Textbook of Organic Chemistry- A.K. Bansal – New Age

11.Organic Chemistry – I.L.Finar – volume I&II- Addison Wesley

12 Organic Chemistry – R.T.Morrison and Boyd – Prentice

JOURNALS

6. Asian Journal of Organic Chemistry

7. Organic Chemistry international

8. Indian journal of Chemistry

E-LEARNING RESOURCES:

1 <https://www.sciencedirect.com/topics/chemistry/ionic-bond>

2 <https://pubs.acs.org/doi/abs/10.1021/ed040p295>

5. <https://pubs.acs.org/doi/abs/10.1021/ja01355a027>

6. <https://pubs.er.usgs.gov/publication/70034984>

7. <https://onlinelibrary.wiley.com/journal/1097461x>

COURSE OUTCOMES:

CO Number	CO STATEMENT
Unit 1	Understood electronic configuration of elements and periodicity
Unit 2	Discussed the Principle of inorganic analysis.And studied S-Block elements
Unit 3	Outlined the synthesis and properties of alkynes and Dienes
Unit 4	Explained the basics of polymerisation .learned the synthesis and properties of cycloalkanes
Unit 5	Discussed the fundamentals,Zeroth law of thermodynamics and first law of thermodynamics

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	3
CO2	2	2	3	2	1
CO3	3	3	3	3	2
CO4	1	3	3	3	3
CO5	3	2	3	1	3
AVERAGE	2.4	2.6	2.8	2.4	2.4

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER II

GENERAL CHEMISTRY III

Total Hrs: 90

Course Code:172303

No. of Credits : 4

COURSE OBJECTIVES:

- Explains the importance of theories and concepts of molecules
- Analyse the discussion, structure and properties of oxygen and halogen family
- Classifies the nomenclature and preparation of alcohols
- Describes the preparation, properties and applications of acids
- Compare the nature, arrangement, law of liquid state, solution and its mesomorphic state

COURSE OUTLINE

UNIT- I

15 hrs

1.1 Molecular Orbital theory

Bonding, Anti-bonding molecular orbitals and Bond order.

Postulates of molecular orbital theory-Linear combination of atomic orbitals(LCAO),

MO energy level diagram of homo and hetero diatomic molecules and molecular ions- H_2 , H_2^+ , H_2^- , He_2 , O_2 , O_2^+ ,

O_2^- , O_2^{2-} , F_2 , N_2 , CO , NO , NO^+ , CN^- , HF bond order and stability of molecules.

1.2 Volumetric Analysis

Mole concept - molarity, molality, normality of solutions, mole fraction, Calculation of equivalent weights (acids, bases, salts, reducing and oxidizing agents).

Primary and secondary standards, selection of primary standards, types and principles of titrations – acid-base, redox, precipitation, complexometric titrations.

Theories of acid base indicators - Ostwald's and Quinoid theory. Choice of indicators- methyl orange and phenolphthalein.

UNIT- II

15 hrs

2.1 Oxygen Family

Group discussion, Fluorides of Oxygen, Oxyacids of Sulphur, Selenium and Tellurium, Peracids – Caro's acid, Marshall's acid, Thionic acids – di, tri and

tetra thionic acid –Structure, preparation and properties of Sulphur di-oxide and Sulphur tri-oxide.

2.2 Halogen Family

Group discussion, Oxides and Oxyacids of Halogens (structure only), Interhalogen compounds, Pseudo halogens, Basic properties of Iodine. Fluorides of oxygen. Exceptional properties of Fluorine.

Unit –III

15 hrs

Alcohols

3.1 Introduction – Nomenclature. General methods of preparation – Oxymercuration – demercuration – Hydroboration – Oxidation – with the help of a Grignard reagent. Analytical tests for alcohols, Distinction between Primary, Secondary and Tertiary Alcohols – By the

action of hot reduced Copper, - Victor Mayer's Method, By relative reactivities of the alcohols with hydrochloric acids and Zinc chloride

3.2 Dihydric Alcohols- Nomenclature, preparation of Ethylene Glycol, Glycol uses. Trihydric alcohols – preparation of Glycerol uses.

Unit –IV

15 hrs

4.1 Dicarboxylic acids- Preparation and properties of Oxalic, Malonic, Succinic, Glutaric and Adipic acids.

4.2 Synthesis involving active methylene group:

Preparation and synthetic uses of Malonic, Acetoacetic and cyanoacetic ester.

4.3. Diazomethane and diazoacetic ester- Preparation, structure and synthetic applications.

Unit – V

15 hrs

5.1 Liquid state: Nature of cohesive forces in liquids – Vapourisation of liquids and their characteristics – Trouton's rule and its significance . Surface Tension – Influence of temperature on Surface Tension .

5.2 Mesomorphic state: Liquid crystals, classification and molecular arrangements.

5.3. Solutions: Solutions of gases in liquids, Henry's law, solutions of liquids in liquids - ideal and non-ideal solutions, Raoult's law – Deviation from ideal behaviour, vapour pressure – composition and boiling point-composition curves of completely miscible binary solutions, Azeotropic distillation.

RECOMMENDED TEXT BOOKS

2. Principles of Physical Chemistry – B.R.Puri and Sharma –m Shoban lal Nagin Chand & co.
3. Text Book of Physical Chemistry – P.L.Soni – Sultan Chand
4. Physical Chemistry – Negi and Anand - New Age
5. Physical Chemistry – Kundu and Jain - Sultan Chand
6. Physical Chemistry - P.L.Soni and Dharma
7. Text book of Organic Chemistry – P.L.Soni –Sulthan Chand
8. Advance Organic Chemistry – B.S. Bahl – S. Chand

9. Inorganic Chemistry – P.L. Soni- Sultan Chand
10. Inorganic Chemistry - Puri and Sharma- Nagin
11. Inorganic Chemistry – Madan – S. Chand
12. Advanced Inorganic Chemistry – Cotton and Wilkinson

REFERENCE BOOKS

1. [Elements of Physical Chemistry \(5th Edition\) By Peter Atkins and Julio de Paula](#)
2. [Essentials of Physical Chemistry \(multicolor edition\) By Arun Bahl, B.S. Bahl and G.D. Tuli](#)
3. [Physical Chemistry \(8th Edition\) By Peter Atkins and Julio De Paula](#)
4. [A Textbook of Inorganic Chemistry – Volume XI , Part I By J. Newton Friend](#)
5. [Organic Chemistry \(6th Edition\) By Robbert T.Morrison and Robert N. Boyd](#)
6. [Concise Inorganic Chemistry \(4th Edition\) By J.D. Lee](#)

JOURNALS

1. [Molecules | An Open Access Journal from MDPI](#)
2. [The Solutions Journal - For a sustainable and desirable future](#)
3. [Journal of Solution Chemistry - Springer](#)
4. [Journal of Organic Chemistry](#)
5. [European Journal of Organic Chemistry - Wiley Online Library](#)

E-LEARNING RESOURCES:

UNIT	E links
1	https://en.wikipedia.org/wiki/Molecular_orbital_theory https://byjus.com/chemistry/volumetric-analysis/
2	https://en.wikipedia.org/wiki/Chalcogen https://www.britannica.com/science/halogen
3	https://byjus.com/chemistry/types-of-alcohols/
4	https://en.wikipedia.org/wiki/Dicarboxylic_acid https://www.britannica.com/science/ester-chemical-compound
5	https://www.askiitians.com/iit-jee-states-of-matter/liquid-state.html http://www.quantumstudy.com/chemistry/liquid-solutions-3/

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Identified the importance of theories and concepts of molecules

CO 2	Formulated the discussion, structure and properties of oxygen and halogen family
CO 3	Demonstrated the properties, preparation and uses of alcohols
CO 4	Compiled the preparation, properties and applications of acids
CO 5	Compared the nature, arrangement, principles involved in liquid state, mesomorphic state and solutions

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	2	1
CO2	1	3	2	3	3
CO3	2	1	3	2	1
CO4	3	3	1	3	2
CO5	2	1	3	1	3
AVERAGE	2	2	2	2	2

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER III

GENERAL CHEMISTRY IV

Total Hrs: 60

Course Code:172305

No. of Credits : 4

COURSE OBJECTIVES:

- To enable the students to acquire the quantitative skills in gravimetric analysis
- To learn the preparative skills in inorganic preparations.
- To understand the concepts of thermodynamics and apply it to physical and chemical systems.

COURSE OUTLINE

Unit –I**15 hrs**

1.1 Principles of Gravimetric analysis, Characteristics of precipitating agents, Choice of precipitants and conditions of precipitation, Specific and Selective precipitant - DMG, Cupferon, Salicylaldehyde, Ethylenediamine.

1.2 Co- precipitation, post-precipitation, peptisation, Precipitation in homogeneous Solution - Calculation in gravimetric methods - Use of gravimetric factor.

Unit –II**15 hrs**

2.1. Lewis concept of acids and bases, Hard and soft acids and bases-HSAB principle.

2.2. Acid – base Lux flood Equilibria- pH of strong and weak acid solution. Buffer solutions, preparation of acidic and basic buffers. Relative strength of acids and bases from K_a and K_b values

2.3. Position of noble gases in the periodic table, preparation, hybridization and geometries of XeF_2 , XeF_4 , XeF_6 , XeOF_4 , XeO_3 . Preparation and uses of Clathrate compounds.

Unit –III**15 hrs**

Carbohydrates: Classification, Reactions of glucose and fructose, Osazone formation, Structural elucidation of glucose and fructose. Muta-rotation and its mechanism, Epimerisation. Interconversion of glucose to fructose and vice- versa. Conversion of pentose to hexose. Open chain structure and ring structure of glucose, pyranose and furanose forms, Haworth projection formula. Determination of ring size.

Unit – IV**15 hrs****4.1 Second law of thermodynamics**

Need for the second law, Statements of the second law, Spontaneous process, Carnot cycle, Efficiency, Carnot's theorem (statement only), Concept of entropy- definition, Entropy of an ideal gas, Entropy changes in cyclic, reversible and irreversible processes and physical

transformations, Calculation of entropy changes with changes in temperature, volume and pressure.

4.2. Third law of thermodynamics

Nernst heat theorem, Statement of third law of thermodynamics, Evaluation of absolute entropy from heat capacity measurements. Exceptions of third law.

Unit – V

15

hrs`

5.1. Free energy changes

Gibb's free energy, Helmholtz free energy, their variations with temperature, pressure and volume, Criteria for spontaneity, Gibbs-Helmholtz equation –Derivation and applications.

5.2. Partial molar properties

Chemical potential, Gibbs-Duhem equation, Effect of temperature and pressure on chemical potential, Chemical potential in system of ideal gases, Duhem-Margules equation.

RECOMMENDED TEXT BOOKS

6. Puri B.R, Sharma L.R, Pathania M.S., (1993) Principles of Physical Chemistry 23rd Edition, Shoban Lal Vagin Chand & Co, New Delhi.
7. Bahl B.S and Arun Bahl (1997) Advanced Organic Chemistry, 12th Edition, Sultan Chand & Co, New Delhi.

REFERENCE BOOKS

1. Puri B.R., Sharma L.R., Kalia KK (1993) : Principles of Inorganic Chemistry, 23rd Edition, Shoban Lal Nagin Chand & co, New Delhi.
2. Lee J.D, (2006): Concise of Inorganic Chemistry , Black well Science, UK.
3. Glasstone S, Lewis D, (1960), Elements of Physical Chemistry, Mac Millan & co Ltd, London.
4. P.L.Soni.,H.M.Chawla., Text book of organic chemistry Sulthan chand& sons
5. Morrison R.T and Boyd R.N, (1946) : Organic Chemistry, 6th Edition, New York

JOURNALS

1. Russian journal of general chemistry <https://www.springer.com/chemistry/journal/11>
2. International journal of science & research <https://www.ijsr.net/>

E-LEARNING RESOURCES:

UNIT	E links
1	http://ursula.chem.yale.edu/batista/classes/v570
2	acs.org>thread">http://web.njit.edu>acs.org>thread .
3	generalchemistry>basics">http://www.epa.gov>generalchemistry>basics
4	https://www.livescience.com/51976-carbohydrates.html
5	https://en.wikipedia.org/wiki/Thermodynamics

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Will have a Good exposure to the basic concepts of gravimetric analysis.
CO 2	Understands the basics of hard and soft acids and bases.
CO 3	Acquires the basic knowledge about carbohydrates.
CO 4	Will be able to apply the basic of thermodynamics to calculate the thermodynamic variables.
CO 5	Will be able to explain the various molar properties.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	1	3	3
CO2	2	2	3	2	2
CO3	2	3	3	3	3
CO4	1	3	2	1	2
CO5	3	3	1	3	3
AVERAGE	2.2	2.8	2.0	2.4	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER III**GENERAL CHEMISTRY V****Total Hrs: 60****Course Code:172306****No. of Credits : 4**

COURSE OBJECTIVES:

- To develop & understand about the fundamentals of transition & inner transition elements.
- To impart a basic knowledge on materials such glass , ceramics & fertilizers
- To understand the basic concepts of Nucleophilic substitution & Electrophilic substitution

COURSE OUTLINE**Unit – I****15 hrs**

1.1 Transition Elements Position in periodic table, characteristics, electronic configuration and oxidation state of first, second, third transition series elements, variable valency, application as reductant /oxidant - Cr (VI), Mn (VII), Fe (II) and Cu (II).

1.2 Inner transition Elements:Lanthanides and Actinides.

Position of Lanthanides and Actinides, General properties – colour, spectra, magnetic properties, lanthanide and actinide contraction, comparison of lanthanides and actinides. Extraction of Thorium.

Unit – II**15 hrs**

2.1 Glass-Composition-Manufacture of Glass-Glass fabrication, types of glasses and its application, Soft Glass, Hard Glass, Flint Glass, optical Glass.

2.2 Fertilizers - Characteritics of a fertilizer-preparation and uses of urea, Calcium Ammonium Nitrate, Super Phosphate of Lime, Triple Super Phosphate and Potassium Nitrate- Biofertilizer: Organic Manure-Humus.

2.3 Fuel gases-Calorific value-composition and sources/formation of natural gas, water gas, semi-water gas, carbureted water gas, Producer gas, Oil gas, Gobar gas, LPG- production, composition and uses.

Unit – III**15****hrs**

Nucleophilic substitution

Reaction mechanism of SN_1 and SN_2 substitutions, kinetics and stereochemistry of SN_1 and SN_2 reaction, Effect of solvent polarity on the rates, General comparison of different attacking nucleophiles and leaving groups. Steric effects with respect to the structure of substrates and attacking reagents. S_{Ni} reaction- Mechanism and stereochemistry. Neighbouring group participation.

Unit – IV

15

hrs

4.1 Electrophilic substitution

Electrophilic substitution reaction in aromatic compounds, general mechanisms- Nitration, Halogenation, Sulphonation, Friedel-Craft's Alkylation and Acylation, directive influence, orientation, ortho-para ratio, Nuclear and Side chain Halogenation.

4.2. Elimination reaction

E_1 and E_2 reactions, dehydration, dehydrogenation, Saytzeff's rule and Hoffmann's rule.

Unit – V

15

hrs

Thermodynamic aspects of Chemical equilibrium

5.1 Law of mass action: Application of law of mass action and Le-Chatelier-Braun principle –Formation of ammonia and sulphur trioxide.

5.2. Thermodynamic derivation of law of equilibrium, Free energy and chemical equilibrium. Standard free energy change. Reaction isotherm standard free energy change and equilibrium constant of reaction. Variation of equilibrium with temperature Van't Hoff equation, Effect of pressure on equilibrium constant.

5.3 Concept of Fugacity and Activity- determination of fugacity of gas, activity and activity coefficient.

RECOMMENDED TEXT BOOKS

1. P.L.Soni.,H.M.Chawla., Text book of organic chemistry Sulthan chand& sons
2. Physical Chemsitry – Kundu and Jain - Sultan Chand

REFERENCE BOOKS

1. P.L.Soni.,H.M.Chawla., Text book of organic chemistry Sulthan chand& sons
2. Glasstone S, Lewis D, (1960), Elements of Physical Chemistry, Mac Millan & co Ltd, London.
3. Lee J.D, (2006): Concise of Inorganic Chemistry , Black well Science, UK.
4. Morrisison R.T and Boyd R.N, (1946) : Organic Chemistry, 6th Edition, New York
5. Puri B.R., Sharma L.R., Kalia KK (1993) : Principles of Inorganic Chemistry, 23rd Edition, Shoban Lal Nagin Chand & co, New Delhi.

JOURNALS

1. Industrial chemistry – open access journal <https://www.omicsonline.org/industrial-chemistry.php>
2. Russian journal of general chemistry <https://www.springer.com/chemistry/journal/11>

E-LEARNING RESOURCES:

UNIT	E links
1	https://sciencenotes.org/transition-metals/
2	https://targetstudy.com/courses/bsc-industrial-chemistry.html
3	https://socratic.org/questions/what-are-nucleophilic-and-electrophilic-substitution-reactions
4	https://www.cliffsnotes.com/study-guides/chemistry/organic-chemistry-ii/alkyl-halides/mechanism-of-elimination-reactions
5	https://www.nature.com/subjects/thermodynamics

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	<u>Understands about the fundamentals of transition & inner transition elements.</u>
CO 2	<u>Acquires a basic knowledge on materials such glass , ceramics & fertilizers</u>
CO 3	Understands the basic concepts of Nucleophilic substitution & Electrophilic substitution.
CO 4	Develops a sound knowledge on chemical thermodynamics
CO 5	Can discuss the use of various glasses, fertilizers and fuels in everyday life.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	3	1	2
CO2	3	2	2	3	3
CO3	2	3	2	3	2
CO4	3	1	3	1	3
CO5	1	2	3	3	3
AVERAGE	2.4	1.8	2.6	2.2	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER IV

GENERAL CHEMISTRY VI

Total Hrs: 75

Course Code:172307

No. of Credits : 4

COURSE OBJECTIVES:

- To study the basic ideas of metallic bond

- Different types of paints with its ingredients is focused
- To study the preparation and properties of various heterocyclic compounds
- Different types of adsorption and colloids are studied
- To study the laws of ionic equilibrium.

COURSE OUTLINE

15 hrs

Unit – I

1.1 Metallic bond:Theories of bonding in metals –free electron theory, valence bond theory, molecular orbital theory-band theory, metallic properties –explanation. Alloys-definition, uses. Substitutional and interstitial alloys, Hume-Rothary rules.

1.2 Paints: Ingredients of paints - characteristics of paints - mechanism of drying oil -defects in painting, types of paint - luminous, heat resistant, fire retardant, water repellant, temperature-indicating paints.

Unit – II

15

hrs

2.1 Aromaticity: Huckel's ($4n+2$) rule, and simple applications to benzene compounds and Heterocyclic compounds.

2.2. Strength of aliphatic and aromatic acids: Effect of substituents on the strength of acids.

2.3. Mechanisms of esterification and transesterification reactions.

2.4 Heterocyclic compounds: Preparation, properties and uses of Furan, Pyrrole, Thiophene and Pyridine, comparison of basicity of Pyridine with Pyrrole, synthesis and reactions of Quinoline, Isoquinoline and Indole.

Unit – III

15

hrs

3.1 Phenols : Nomenclature, hydrogen bonding.Acidic character of phenol, explanation on the basis of resonance stabilization Kolbe's reaction, Reimer-Tiemann reaction, Gattermann-Ledereer, Manasse and Houben-Hoesch reactions, Coupling reaction.

3.2 Dihydric phenols- catechol, resorcinol and quinol – preparation, properties and uses.

3.3 Trihydric phenols – pyrogallol, phloroglucinol and hydroxyl quinol – preparation, properties and uses.

3.4 Polynuclear hydrocarbons

Naphthalene, Anthracene, Phenanthracene- isolation, properties, synthesis and uses.

15 hrs

Unit –IV

4.1 The Nernst distribution law: Thermodynamic derivation, Association and dissociation of the solute in one of the solvents, Application of the distribution law, Solvent extraction.

4.2. Adsorption: Physisorption, Chemisorption- Freundlich adsorption isotherm, Langmuir adsorption isotherm, BET equation (no derivation), Applications of adsorption.

4.3. Colloids: Colloidal state of matter - various types - classification - Sols-dialysis-Electro osmosis-Electrophoresis-stability of colloids-protective action-Hardy Schulze law-gold number. - Emulsion: Types of emulsions-emulsifier with examples- Gels - Classification, preparation - Application of colloids.

Unit – V

15

hrs

Ionic Equilibria: Introduction-Arrhenius concept, Concept of Lowry and Bronsted-Conjugate acids and bases- Lewis concept - Relative strengths of acids and bases - Dissociation of weak acids and bases-Ostwald's Dilution law- p^H p^{OH} and p^{K_a} scales -ionic product of water, common ion effect, Concept of solubility product,

Buffer action- Henderson equation- Applications of buffer. Hydrolysis of salts & Degree of hydrolysis- salt of a strong acid and a strong base, salt of a strong acid and a weak base, salt of a weak acid and a strong base and salt of a weak acid and a weak base.

RECOMMENDED TEXT BOOKS

1. Industrial Chemistry – B.K. Sharma
2. Advanced Inorganic Chemistry – Cotton and Wilkinson
3. Inorganic Chemistry – P.L. Soni- Sultan Chand
4. Text book of Organic Chemistry – P.L.Soni –Sulthan Chand

5. Principles of Physical Chemistry – B.R.Puri and Sharma –m Shoban lal Nagin Chand & co.

REFERENCE BOOKS

1. Chemiscal Process Industries – Norris Shreve Josephin A.Brink
2. Advance Organic Chemistry – B.S. Bahl – S. Chand
3. Organic Chemistry – R.T.Morrison and Boyd – Prentice
4. Stereochemistry of Organic compounds – D. Nasipuri – New Age
5. StereoChemsitry, conformation and mechanisms – Kalsi – New Age
6. Text Book of Physical Chemsitry – P.L.Soni – Sultan Chand
7. Physical Chemsitry – Negi and Anand - New Age

JOURNALS

1. Journal of American Chemical Society, 1994116198810, September, 1, 1994,
<https://doi.org/10.1021/ja00098a051>

2. The Journal of Organic Chemistry. 73 (7): 2607– 20.doi:
<https://doi.org/10.1021/jo702513w>

E-LEARNING RESOURCES:

1. <http://www.springer.com/chemistry/organic+chemistry/journal/10593>
2. <http://pubs.acs.org/journal/orlef7>
3. <https://link.springer.com/chapter/10.1007/978-1-4419-8382->
4. <https://link.springer.com/book/10.1007/978-1-4020-5164-7>
5. https://link.springer.com/chapter/10.1007/978-1-4419-8382-4_4

COURSE OUTCOME:

CO Number	CO STATEMENT
CO1	To discuss the different theories and properties of metallic bond.
CO2	To explain the utility of various kinds of paints.
CO3	To compute the Knowledge of the preparation, properties and uses of various hetero cyclic compounds.
CO4	To discuss the wide knowledge of acid and bases, colloids, surface phenomena.

CO5	To predict the relative strengths of acids and bases.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	1	2	2	3	3
CO2	2	3	1	2	3
CO3	2	2	1	2	2
CO4	3	3	3	3	2
CO5	2	2	3	3	1
AVERAGE	2.0	2.4	2.0	2.6	2.2

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER V **INORGANIC CHEMISTRY**

Total Hrs: 60

Course Code:172309

No. of Credits : 4

COURSE OBJECTIVES:

- To create wide knowledge about the various radioactive isotopes and its uses
- To demonstrate the crystal structure of varied types of crystal systems
- To communicate and create wide knowledge about nomenclature and various theories governing coordination compounds

COURSE OUTLINE

UNIT - I

15 hrs

1.1 Nuclear Chemistry

Fundamental particles of nucleus - Isotopes, Isobars, Isotones with examples, structure of nucleus, radius, density, packing fraction, stability of nucleus - binding energy, n/p ratio, magic numbers, Odd-even rule.

1.2 Nuclear processes: Induced and spontaneous, electron capture, nuclear reactions - classification and examples, Stellar energy.

1.3 Radioactivity: Group displacement law, radioactive series, natural and artificial radioactivity, Determination of half-life, Rate of decay, Geiger-Natta rule. Determination of radioactivity, Wilson cloud, Geiger-Muller and Scintillation counters.

UNIT - II

15 hrs

Applications of Nuclear Chemistry

Nuclear fission and nuclear fusion, nuclear reactors, accelerators, fission chain reaction, working principle of conventional reactors and Breeder reactors, fusion reactions – controlled fusion, Analytical applications- carbon dating, neutron activation analysis, labeling to study the kinetics of the reaction, Medical and agricultural applications, Hazards and precautions of nuclear technology.

UNIT - III

15

hrs

Solid State Chemistry

3.1 Elements of symmetry, crystal systems, Miller indices, unit cell, space lattice, Bravais lattices. Bragg's equation – Determination of interplanar distance and wave length of X-rays.

3.2 Types of Crystals-Ionic, Molecular, covalent and metallic crystals.

Structure of metallic crystals with examples – NaCl, CsCl, ZnS, Fluorites, Rutile.

Crystal defects: Schottky and Frenkel defects.

3.3 Band theory-conductors, insulators, semiconductors, transistors (basic ideas only).

UNIT – IV

15 hrs

Co-ordination Chemistry

Nomenclature, isomerism, theories of coordination compounds – Werner's theory, Sidgwick theory, Valence bond theory, Crystal Field theory, Comparison of VBT and CFT, Magnetic properties, geometry and colour of complexes.

UNIT - V

15 hrs

5.1 Organo metallic compounds: Nomenclature of organometallic compounds, 18-electron rule.

5.2 Carbonyls and Nitrosyls

Preparation and structure of mono and binuclear compounds of Cr, Ni, Fe, Co & Mn.

5.3 Synthesis, structure and applications of organometallic compounds-Lithium and Boron.

5.4 Wilkinson's catalyst and alkene hydrogenation, hydroformylation, Use of Ziegler-Natta catalyst in the polymerization of olefins.

RECOMMENDED TEXT BOOKS

1. Inorganic Chemistry – P.L. Soni- Sultan Chand

2. Inorganic Chemistry - Puri and Sharma- Nagin
3. Inorganic Chemistry – Madan – S. Chand
4. Nuclear and Radiation Chemistry – R.K. Sharma
5. Essential of Nuclear Chemistry – H.J. Arniker

REFERENCE BOOKS

1. Advanced Inorganic Chemistry – Cotton and Wilkinson
2. A text book of Inorganic Chemistry – A.K. De – New Age
3. General Inorganic Chemistry – Part-I – Sarkar, Books and Allied .(P) Ltd
4. General Inorganic Chemistry - Part-II – Sarkar, Books and Allied .(P) Ltd
5. Chemical methods for environmental analysis Ramesh and Anbu, Macmillan.
6. Concise Inorganic Chemistry – J.D. Lee – Vth edition
7. Text book of Macro and semi micro qualitative Inorganic analysis m- Vogel
8. Semi micro qualitative analysis – Ramanujam
9. Advance Practical Inorganic Chemistry - dr. Gurdeep Raj
10. Bonds, Metallic, Hydrogen Clathrate compounds – V.M. Bhatnagar
11. Text book of metallurgy – Bailey .A.K.
12. d- block elements – Dr. S. Sundaram, Dr. S. Srinivasan
13. Selected topics in Inorganic Chemistry – Malik, Tuli, Madan
14. Advanced Inorganic Chemistry – Satyaprakash, Tuli Basu, Madan
15. Nuclear and Radiation Chemistry – R.K. Sharma

1.

JOURNAL

3. Journal of Solid State Chemistry
4. Journal of Organometallic Chemistry

E-LEARNING RESOURCES:

- UNIT 1 <https://www.hindawi.com>jnc>
- UNIT 2 <https://www.nature.com>articles>
- UNIT 3 <https://www.researchgate.net>journal>
- UNIT 4 <https://www.scimagojr.com>journal>

Course outcomes

CO Number	CO STATEMENT
CO 1	Wide knowledge about various radioactive isotopes and its uses is created among learners
CO 2	Crystal structure of various crystal systems is demonstrated
CO 3	Theories governing coordination compounds is discussed
CO 4	Importance of various Inorganic catalysts in chemical reactions is communicated
CO 5	Different models relating to solid state crystals is demonstrated

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	2	3
CO2	2	2	3	2	3
CO3	2	2	2	3	3
CO4	3	3	1	3	2
CO5	3	2	3	3	3
AVERAGE	2.6	2.2	2.4	2.6	2.8

SEMESTER V
ORGANIC CHEMISTRY –I

Total Hrs: 60

Course Code:172310

No. of Credits : 4

COURSE OBJECTIVES:

- To get an insight on optical isomerism.
- To understand the concept of geometrical isomerism and conformational analysis
- To learn structural elucidation of natural products like terpenes and alkaloids.
- To understand the importance of aminoacids and structure of proteins
- To gain importance and functions of nucleic acids and genetic materials

COURSE OUTLINE

Unit – I

15hrs

Optical isomerism

1.1. Optical isomerism- optical activity, angle of rotation and specific rotation, conditions for optical activity, asymmetric center, chirality, achiral molecules, meaning of (+) and (-) representation.

D and L notations, erythro and threo representations. Elements of symmetry, racemization, methods of racemization (by substitution and tautomerism), methods of resolution (mechanical, seeding, biochemical and conversion to diastereomers), Walden inversion.

1.2. Projection Formula- Fischer, flying wedge, sawhorse and Newmann projection formula. Cahn-Ingold-Prelog rules, R and S nomenclature for optical isomers with one and two asymmetric carbon atoms.

1.3. Optical activity in compounds not containing asymmetric carbon atoms - Biphenyls, Allenes and Spiranes.

Unit – II

15 hrs

2.1 Geometrical isomerism

Cis-trans isomerism in Maleic and Fumaric acid and unsymmetrical ketoximes, methods of distinguishing using melting point, dipole moment, dehydration, cyclisation and heat of hydrogenation.

2.2 Conformational analysis

Introduction - Conformers, configuration, dihedral angle, torsional strain. Conformational analysis of ethane and n-butane including energy diagrams, conformers of cyclohexane (chair, boat and skew boat forms), axial and equatorial, conformers and stability of mono and di substituted cyclohexane.

Unit-III

15 hrs

3.1 Terpenoids / terpenes

Definitions - Isoprene rule and special isoprene rule – Classification - Occurrence (general) isolation of essential oils and separation of mono and sesquiterpenoids – General properties.

Structural elucidation of geraniol, menthol and alpha terpeniol.

3.2 Alkaloids

Definition – Occurrence – Classification – General properties – Physiological activity- General methods of extraction of alkaloids from plants.

Synthesis and Structural elucidation - conine, piperine and nicotine.

Unit – IV

15 hrs

4.1 Aminoacids - Classification of aminoacids, essential and non-essential amino acids, preparation of alpha amino acids, properties and reactions, Zwitter ion, iso-electric point, peptide synthesis, structure determination of polypeptides, end group analysis.

4.2 Proteins – Classification based on physical and chemical properties and on physiological function, Primary and Secondary and tertiary structure of proteins, Helical and sheet structure (elementary treatment only), denaturation of proteins, colour reactions of amino acids and proteins.

Unit V

15 hrs

5.1. Nucleic Acids

Nucleosides and nucleotides – purines and pyrimidine bases. Nucleic acids-Difference between DNA and RNA. Classification of RNA.

Biosynthesis of DNA- Replication. Biosynthesis of mRNA- Transcription(Elementary ideas).

Genetic code – mutations, mutants and DNA repair.

5.2. Lipids

Definitions of fats, oils, distinction between fats and oils, properties of fats and oils, Fatty acids – Saturated, unsaturated fatty acids – significance of omega-3 fatty acids.

Analysis of fatty acids-saponification number and iodine number. Auto-oxidation (Rancidity) .

5.3. Disaccharides-Reactions and structural elucidation of sucrose.

5.4. Polysaccharides – structure of starch and cellulose, derivatives of cellulose nitrate and cellulose acetate.

RECOMMENDED TEXT BOOKS

1. A text book of Organic Chemistry-Arun Bahl and B.S. Bahl, S.Chand&Co
2. Organic Chemistry P.L.Soni
3. Principles of Reaction mechanisms in Organic Chemistry–V.S Pamer and H.M Chawla, Sultan Chand & Sons
4. Organic Chemistry-K.T. Tewari, S.Chand & Co
5. Organic reaction mechanisms-P.S.Kalsi
6. Chemistry of Natural Products Vol 1 and Vol II- Gurdeep & Chatwal
7. Chemistry of Natural Products Vol 1 and Vol II- O.P. Agarwal

REFERENCE BOOKS

1. Advanced Organic Chemistry: Part A: Structure and Mechanisms –Francis A. Carey abd R.J Sundberg
2. Organic Chemistry-I.L.Finar Volume I and II
3. Organic Reaction and Mechanisms-V.K.Ahluwalia
4. Organic Chemistry-Jain and Sharma
5. Organic Chemistry-Jerry March

JOURNALS

1. [Journal of Organic Chemistry](#)

2. [International journal of Organic Chemistry](#)
3. [Asian Journal of Organic Chemistry](#)
4. [Organic Chemistry international](#)
5. [Indian journal of Chemistry](#)

E-LEARNING RESOURCES:

UNIT	E links
1	https://en.wikibooks.org/wiki/Structural_Biochemistry/Organic_Chemistry/Stereochemistry https://www.chem.purdue.edu/jmol/cchem/opti.html https://chem.libretexts.org/Bookshelves/Organic_Chemistry/Supplemental_Modules_(Organic_Chemistry)/Fundamentals/Isomerism_in_Organic_Compounds/Optical_Isomerism_in_Organic_Molecules
2	https://en.wikipedia.org/wiki/Conformational_isomerism
3	https://biocyclopedia.com/index/medicinal_plants/alkaloids/terpenoid_alkaloids.php
4	https://www.khanacademy.org/test-prep/mcat/chemical-processes/amino-acids-peptides-proteins-5d/a/chemistry-of-amino-acids-and-protein-structure
5	https://www.khanacademy.org/test-prep/mcat/chemical-processes/nucleic-acids-lipids-and-carbohydrates/e/nucleic-acids--lipids--and-carbohydrates-questions

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	An indepth knowledge on optical isomerism
CO 2	A thorough knowledge on geometrical isomerism and conformational analysis
CO 3	Learnt the importance of natural products and their structural elucidation
CO 4	A thorough understanding on amino acids and their importance
CO 5	Appreciated the importance of nucleic acids and polysaccharides

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	2	3	2
CO2	3	2	2	3	3
CO3	3	2	2	2	2
CO4	2	2	3	1	2
CO5	2	2	2	2	2
AVERAGE	2.4	2.6	2.8	2.8	2.8

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER V PHYSICAL CHEMISTRY

Total Hrs: 60

Course Code:172311

No. of Credits : 4

COURSE OBJECTIVES:

- To learn basic knowledge about group theory.
- To determine integrated rate expression for Zero, first, second and third order reaction and their respective half life period.
- To explain the collision theory of simple and bimolecular reaction.
- To impact the students the knowledge on phase rule, its applications and alloys, their importance, composition and applications.
- To learn about colligative properties and determination of molecular weight

COURSE OUTLINE

Unit – I

15 hrs

Group theory:

Symmetry elements-Symmetry operations, point groups, characteristics of C_{2V} , C_{3V} , C_{2h} , D_{2h} , D_{4h} , D_{6h} groups, subgroups, class, similarity transformation, Group multiplication table for C_{2V} and C_{2h} point groups.

Unit – II

15 hrs

Chemical Kinetics:

Order and molecularity of reactions – Rate, order, rate law, rate constants, simple reactions involving zero, first, second and third order reactions, Derivation of rate equations for zero, first and second order reactions, pseudo-first order reactions, Half life period, Determination of rate, rate constant and order by different methods.

Types of reactions – Reversible or opposing, consecutive and parallel reactions (no derivation). Thermal chain reaction $\text{H}_2\text{-Br}_2$, Dissociation of acetaldehyde (only steps involved). Effect of temperature on reaction rates, Arrhenius theory.

Unit – III

15 hrs

Theory of chemical reaction rates:

Collision theory- Derivation of rate constant for bimolecular reaction, its limitation, Lindemann's theory of unimolecular theory, theory of absolute reaction rates- thermodynamic derivation for the rate constant for a bimolecular reaction, comparison of collision theory and ARRT, significance of entropy and free energy of activation.

Unit- IV

15 hrs

Phase rule:

Concepts of phase, component, and degrees of freedom, with examples, Gibb's phase rule – derivation, Clapeyron and Clausius-Clapeyron equations and their applications to equilibria in phase transitions (solid-liquid, liquid-vapour, vapour-solid).

One-component system – water and sulphur systems, Two-component systems- Simple eutectic system- lead-silver system, formation of compound with congruent melting point – Ferric Chloride-water system, Zn-Mg system, Two component system with incongruent melting point – NaCl- water system, freezing mixtures, CST and Effect of impurities on CST.

Unit – V

15 hrs

Colligative Properties:

Lowering of vapour pressure-Osmotic pressure, Laws and Measurement of osmotic pressure, Thermodynamics derivation for elevation of boiling point and depression of freezing point. Relationship between osmotic pressure and V.P. Vant Hoff's theory of dilute solutions. Analogy between solute particles and gas molecules. Determination of molecular weight, Landberger's method and Beckmann method, Abnormal molecular weights.

RECOMMENDED TEXT BOOKS

1. Physical chemistry vol.3 by B.R.puri, L.R.sharma, M.S pathnia and co.
2. A textbook of physical chemistry by K.L kapoor
3. Physical chemistry by Atkins peter

REFERENCE BOOKS:

1. Essential of physical chemistry by Arun Bahl, B.S.Bahl and G.D.Tuli.
2. Group theory by A.K.Swarna Lakshmi
3. Group theory by M.S.Gopinath
4. Chemical kinetics by Keith J.laidler
5. Chemistry for degree students by G.D.Tuli, R.L.Madan

JOURNALS:

- International journal of chemical kinetics

- Physical chemistry and Indian journal

E-LEARNING RESOURCES:

- <https://www.pdfdrive.com/atkins-physical-chemistry-d33409139.html>
- <https://www.pdfdrive.com/physical-chemistry-4th-edition-d33409260.html>
- <https://chemistry.com.pk/books/essentials-of-physical-chemistry-arun-bahl/>
- <https://chemistry.com.pk/books/physical-chemistry-david-w-ball/>
- <https://chemistry.com.pk/books/physical-chemistry-ira-n-levine/>

COURSE OUTCOME:

CO Number	CO STATEMENT
CO1	Critique about the symmetry elements and operations and basics concepts of point groups.
CO2	Evaluate the rate of reaction and factors affecting it.
CO3	Analyses the theory of reaction kinetics and differentiate them.
CO4	Formulate the importance of phase diagrams in the field of material science and engineering.
CO5	Explain the definitions and terms in colligative properties.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	3	3	3
CO2	2	2	3	2	2
CO3	3	3	3	3	2
CO4	2	2	3	2	2
CO5	3	2	2	3	2
AVERAGE	2.6	2.2	2.8	2.6	2.2

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER V
ANALYTICAL CHEMISTRY

Total Hrs: 60

Course Code: 172312

No. of Credits : 4

COURSE OBJECTIVES:

- To understand the principles behind analytical techniques
- To know the methods of selecting appropriate techniques in analysis
- Understand the basic of spectroscopic techniques and its functions and apply the techniques in structural elucidation

COURSE OUTLINE

Unit –I

15 hrs

1.1 Data Analysis: theory of errors, idea of significant figures and its importance with examples, precision, accuracy, error analysis, minimizing errors, method of expressing precision, average deviation, standard deviation and confidence limit.

1.2 Thermal analytical methods: principles involved in thermo gravimetric Analysis (TGA) and differential thermal analysis (DTA), discussion of various components with block diagram, characteristics of TGA and DTA, factors affecting TGA and DTA curves thermometric titrations with any one example.

Unit – II

15hrs

Separation and purification techniques: principles involved in the separation of Precipitates, solvent extraction and electrophoresis, purification of solid organic compounds, extraction, use of immiscible solvents, soxhlet extraction, crystallization, use of miscible solvents, fractional crystallization, sublimation, purification of liquids, experimental techniques of distillation, fractional distillation, vacuum distillation, steam distillation, tests for purity, azeotropic distillation.

Unit – III

15

hrs

UV–Visible spectroscopy - absorption laws, derivation of Beer-Lambert's law and its limitation, instrumentation- Double beam UV spectrophotometer, block diagrams with description of components-sources, prism,grating,cuvettes,photomultiplier tube.Frank condon principle, types of electronic transitions for organic compounds, chromophore and auxochromes, bathochromic, hypsochromic, hyperchromic and hypochromic shifts, factors governing absorption maximum and intensity.

Unit –IV

15

hrs

Nuclear Magnetic Resonance spectroscopy – principle of nuclear magnetic resonance, instrumentation, shielding mechanism, chemical shift, factors affecting chemical shift, reference, Tetramethylsilane (TMS), number of signals, spin-spin coupling and coupling constants, rules governing NMR signal splitting, NMR spectrum of simple organic compound with respect to ethyl alcohol, n-butane, butene, ethyl methyl ketone and toluene.

hrs

Polarimetry: principle, angle of rotation, factors affecting angle of rotation, specific rotation, optical rotatory dispersion and circular dichroism, cotton effect, polarimeter, block diagram with explanation, estimation of glucose, inversion of canesugar, relative strengths of acids.

RECOMMENDED TEXT BOOKS

1. Elements of Analytical Chemistry – R. Gopalan, P.S.Subramanian
2. Analytical Chemistry – A. Venkateswaran, K.Vaidyanathan

REFERENCE BOOKS

1. Christian, G.D and J.E O'Relly(1986) : Instrumental Analysis, Allyn Bacon.
2. Sivasankar, B(2012) : Instrumental methods of Analysis, Oxford University Press.
3. Kavr, H(2001) : Instrumental methods of Chemical analysis, Pragati Prakasham 1st Edition, Meerut.
4. Skoog, D.A, West, D.M and Holles, F.J and Crouch, S.R(2007). Fundamentals of Analytical Chemistry, 8th Edition, Saunders College publishers.
5. Miller, J.C and Miller, J.N(1988) statistics for Analytical Chemistry – Ellis Horwood Chichester.
6. Skoog, Willard and Dean (1988) Instrumental methods of analysis, 8th Edition East West Press, New Delhi 1988.

JOURNALS

1. Analytical Chemistry <https://pubs.acs.org/journal/ancham>
2. Langmuir - <https://pubs.acs.org/journal/langd5>

E-LEARNING RESOURCES:

UNIT	E links
1	http://wiki.anton-paar.com
2	http://www.chemic-biologic.uni.siegen.de
3	http://eic.rsc.org
4	http://www.researchgate.net
5	http://www.indiastudychannel.com

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Will acquire an idea about the various analytical techniques.
CO 2	Acquires a skill in selecting appropriate separation methods.
CO 3	Students will be familiarize in basic spectroscopic.
CO 4	Will be able to apply the NMR spectroscopic techniques for structural elucidation.
CO 5	Gains the fundamental knowledge about optical activity.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	3	1	2
CO2	3	2	2	3	3
CO3	2	3	2	3	2
CO4	3	1	3	1	3
CO5	1	2	3	3	3
AVERAGE	2.4	1.8	2.6	2.2	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER V

PHARMACEUTICAL CHEMISTRY (ELECTIVE-I)

TOTAL HOURS:75

COURSE CODE:172313

CREDITS:5

COURSE OBJECTIVES:

1. To understand the concept of action of drugs, additives added during the preparation of drugs, storage of drugs and its naming.
2. To learn about the various biological importance of antibiotics, vitamins, blood, etc.,
3. To have an idea about anaesthetics, antiseptic, disinfectant and first aid.

COURSE OUTLINE

UNIT I

15 hrs

- 1.1.Introduction: Importance of chemistry in pharmacy, important terminologies used in pharmacy and their meaning, molecular pharmacology, pharmacophore, pharmacodynamics, metabolites, antimetabolites, bacteria, virus, fungi, actinomycetes, name of drugs, code no, chemical propriety, trivial, trade, non-propriety names, storage of drugs mechanism of action of drugs, types-Assay, biological, chemical, immunological(statement only).
- 1.2.Organic pharmaceutical aids, role of preservatives, antioxidants, colouring, flavouring, sweetening, emulsifying agents, stabilizing and suspending agents, ointment bases, solvents.

UNIT II

15 hrs

- 2.1.Antibiotics: Definition, structure activity relationship of chloroamphenicol: Penicillin, Streptomycin and Erythromycin(structure alone), fields of applications.
- 2.2.Sulphanamides: Mode of drugs action, preparation and uses of sulphadiazine, sulphapyridine, sulphathiazole, sulphafurazole, sulphaguanidine and prontosil.
- 2.3.Antipyretic and analgesics agents: Classification, action of analgesics, narcotic analgesics – morphine and synthetic analgesics -pethidine and methadone, mechanism of action.

UNIT III

15 hrs

3.1. Antipsychotic agents: Tranquilisers, sedatives, hypnotics, psychedelic drugs.

3.2. Psycho mimetic drugs: LSD, Marijuana – Effects and applications.

3.3. Vitamins: Classification, sources, deficiency diseases, therapeutic uses.

3.4. Anaesthetics: Definition, classification, volatile anaesthetics, ether, chloroform, halothane, trilene, ethyl chloride, nitrous oxide, cyclopropane- advantages, disadvantages and uses, Intravenous anaesthetics - Thiopental sodium, Methohexitone, Propanidid, Local anaesthetics, requisites, uses, ester compounds, Cocaine, Benzocaine, Procaine, Amithocaine, and Proxy metacaine, Amide compounds, Lignocaine, Cinchocaine.

UNIT IV

15 hrs

4.1. Blood: Blood composition, Analysis of blood sample, grouping, Rh factor, role of blood or oxygen carrier, structure of haem, clotting mechanism of blood,

B Pressure-normal, low and high, causes and control, Anaemia – causes, symptoms and treatment, antianaemic drugs.

4.2. Haematological agents: Coagulants and anticoagulants, Coagulants – Vitamin K, Protamine sulphate, dried thrombin, proteins and aminoacids, Anticoagulants – coumarins, Indanediones, Heparin and citric acid, Haemostatics- aminocaproic acid tranexamic acid.

UNIT V

15 hrs

5.1. Antiseptics and Disinfectants: Definition, uses of phenols, dyes, chloramines, chlorhexidine, organomercurials, dequalinium chloride, formaldehyde, chloramines T, cationic surface active agents, nitrofurazone.

5.2.First Aid: First aid in emergencies, uses of plaster of paris, Cardiovascular drugs, Cardiac glycosides, Antiarrhythmic drugs, Antihypertension drugs, Antianginal agents, Vasodilators, Lipid lowering agents. (one example for each).

RECOMMENDED TEXTBOOKS:

1. A Text Book of pharmaceutical Chemistry – JayashreeChosh – S.Chand
2. Pharmaceutical Chemistry – S.Lakshmi - S.Chand

REFERENCE BOOKS:

1. Pharmacology and phaematherapeutics – R.S. Satokar –Popular Prakashman – Vol. I & II
2. A text book of synthetic drugs – O.D. Tyagi – Anmol publications
3. Introduction to biological chemistry – J.Awapara Prentice Hall
4. Biochemistry - A.L. Lehninger
5. Essentials of biological chemistry – James Fanley – East West press

JOURNALS:

- 1.International Journal of Pharmaceutical Chemistry and Analysis
- 2.Indian Journal of Pharmaceutical Science
- 3.International Journal of Medicinal Chemistry.

E-LEARNING RESOURCES:

<https://www.innovativepublication.com/journal/IJPCA>

<https://academic.oup.com/japr/article/21/2/259/852080>

<https://www.mdpi.com/journal/antibiotics>

<https://www.hindawi.com/journals/ijmc/>

<http://ijpsr.com/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Useful and creates awareness regarding the drugs.
CO 2	Analyse the structural activity relationship of antibiotics.
CO 3	Creates awareness to select and use the anaesthetics.
CO 4	Discuss various Blood related activities

CO 5	To apply the Knowledge of first aid.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	2	2	2
CO2	3	2	3	3	2
CO3	1	2	1	3	1
CO4	2	2	1	1	2
CO5	2	1	3	1	3
AVERAGE	2	2	2	2	2

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER VI ORGANIC CHEMISTRY II

Total Hrs: 90

Course Code:172314

No. of Credits : 4

COURSE OBJECTIVES:

- To understand the important organic reactions involving carbonyl compounds
- To identify important of name reactions and rearrangements.
- To gain basic idea on dyes and their preparation with commercial applications
- To Classify and study the chemistry behind nitro and amino compounds
- To recognize the essentials of Chemical compounds in everyday life.

COURSE OUTLINE

Unit – I

15 hrs

Carbonyl compounds - Carbonyl polarization – reactivity of carbonyl group - acidity of alpha hydrogen, mechanisms – Aldol, Perkin, Knoevenagel reaction and Benzoin condensation, Claisen, Wittig, Cannizzaro, Reformatsky reactions.

Mechanisms of reduction with sodium borohydride, LiAlH_4 , Wolff Kishner, M.P.V. reductions, Clemmenson reduction and Haloform reaction.

Unit – II

15 hrs

Molecular rearrangements –Classification as anionotropic, cationotropic, free radical, inter and intramolecular mechanisms.

Mechanisms of Pinacol – Pinacolone rearrangement, Beckman, Hoffmann, Curtius, Benzilic acid rearrangement, Claisen, para-Claisen, Cope and oxy Cope, Fries and Wagner-Meerwein rearrangements.

Unit-III

15 hrs

3.1 Diazonium salts- Preparation, diazotisation and its mechanism, Synthetic applications of diazonium salts.

3.2 Dyes - Definition -Theory of colour and constitution. Structure, preparation and application of the dyes. Classification according to structure and methods of application, preparation and uses of azo-dye-methyl orange, Bismarck brown, Triphenyl methane dyes- Malachite green and crystal violet, Vat dye-Indigo, Phthalein dyes- Phenolphthalein and fluorescein, Anthraquinone dye-Alizarin.

UNIT- IV

15 hrs

Nomenclature, classification, preparation, properties, tests and use of :

4.1. Aromatic nitro compounds- nitrobenzene, dinitro benzenes, nitro compounds of toluene, nitrophenols, nitroanilines, picric acid.

4.2. Aromatic amino compounds: aniline, toluidines, aminophenols, benzidine, anthranilic acid. basicity of amines, effect of substituents on basicity of aromatic amines.

4.3. Aromatic sulphur compounds: benzenesulphonic acid p-toluenesulphonic acid, saccharin, chloramine-T, dichloramine-T.

Chemistry in everyday life

5.1 Soaps and detergents-Soap-definition, Manufacture, Cleansing action of soap, Ingredients in bar soap, toilet soap, liquid soap.

Soapslessdetergents-Anionic, Cationic and non-ionic detergents-Examples of Synthetic detergents-Biodegradability of soaps and detergents.

5.2.Lipids- Neutral lipids, Phospho lipids (lecithines, cephalins, plasmalogens) and Glycolipids. Lipids in bioengineering and material science(elementary ideas).

5.3. FoodAdditives- Sweetners, Preservatives, flavours and colourants with suitable examples.

5.4. Detectionofadulterantsinfooditems- Adulterants in milk, meat, oils, ghee, coffee powder, tea, asafoetida, chilli powder, turmeric powder and pulses.

RECOMMENDED TEXT BOOKS

1. A text book of Organic Chemistry-Arun Bahl and B.S. Bahl, S.Chand&Co
2. Organic Chemistry P.L.Soni
3. Principles of Reaction mechanisms in Organic Chemistry–V.S Pamer and H.M Chawla, Sultan Chand & Sons
4. Organic Chemistry-K.T. Tewari, S.Chand & Co
5. Organic reaction mechanisms-P.S.Kalsi

REFERENCE BOOKS

1. Advanced Organic Chemistry: Part A: Structure and Mechanisms –Francis A. Carey abd R.J Sundberg
2. Organic Chemistry-I.L.Finar Volume I and II
3. Organic Reaction and Mechanisms-V.K.Ahluwalia
4. Organic Chemistry-Jain and Sharma
5. Organic Chemistry-Jerry March

JOURNALS

1. [Journal of Organic Chemistry](#)
2. [International journal of Organic Chemistry](#)
3. [Asian Journal of Organic Chemistry](#)
4. [Organic Chemistry international](#)

5. [Indian journal of Chemistry](#)

E-LEARNING RESOURCES:

UNIT	E links
1	https://en.wikipedia.org/wiki/Carbonyl_group
2	https://onlinelibrary.wiley.com/doi/book/10.1002/9781118939901
3	https://www.ncbi.nlm.nih.gov/books/NBK385442/
4	http://www.iloencyclopaedia.org/component/k2/item/1058-nitrocompounds-aromatic
5	https://byjus.com/jee/chemistry-in-everyday-life/

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Recognized the importance of carbonyl compounds in organic chemistry
CO 2	Identified molecular rearrangements and its course
CO 3	Compiled the synthesis and uses of diazonium compounds and dyes
CO 4	Identified aromatic nitro compounds and its classification/reactions
CO 5	Appreciated the uses of chemistry in everyday life

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	1	3	3	3	1
CO3	3	3	3	2	3
CO4	3	2	2	3	2
CO5	2	3	3	3	3
AVERAGE	2.4	2.6	2.8	2.8	2.4

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER VI

ELECTRO CHEMISTRY AND PHOTO CHEMISTRY (ELECTIVE II)

Total Hrs: 90

Course Code:172315

No. of Credits : 5

COURSE OBJECTIVES:

- To learn about single electrode potential, determination, types of electrodes and cell set up
- To gain knowledge on theory, principles and measurement of conductivity and cell emf
- Acquisition of basic knowledge on photochemistry and kinetic approach for formation and decomposition of molecules

COURSE OUTLINE

Unit – I

15 hrs

Non-Equilibrium Electrochemistry: Metallic and electrolytic conductors - specific, equivalent and molar conductance, measurement of conductance, variation of conductance with dilution for strong and weak electrolytes (qualitative explanation), transport number and its determination by Hittorf and moving boundary methods, migration of ions, ionic mobility and its determination, Kohlrausch's law and its applications.

Unit – II

15 hrs

2.1 Applications of conductivity measurements: Determination of degree of dissociation, ionic product of water, solubility and solubility product of sparingly soluble salts and conductometric titrations.

2.2 Theory of strong electrolytes: Debye-Huckel-Onsager theory, verification of Onsager equation, Wien effect and Debye-Falkenhagen effect, ionic strength, activity and activity coefficients of strong electrolytes.

Unit – III

15 hrs

Equilibrium Electrochemistry

3.1. Types of electrodes: (i) metal-metal ion electrode (ii) amalgam electrodes (iii) gas electrodes (iv) metal insoluble salt electrodes (v) redox electrodes.

3.2. Electrode potential: Single and standard electrode potential.

3.3. Reference electrodes: (i) Primary reference electrode- Hydrogen electrode (ii) Secondary electrode-Calomel electrode, Calculation of cell EMF from single electrode potentials, Definition and applications of electrochemical series.

3.4. Electromotive force: definition, measurement using potentiometer, construction and working of Weston cell, conventions regarding sign of EMF.

3.5. Thermodynamics of electrochemical cell: Derivation of Nernst equation and its use in calculating EMF of cells and electrode potentials, relationship between EMF and (i) free energy changes (ii) enthalpy changes (iii) entropy changes occurring in electrochemical reaction, Equilibrium constants for electrochemical reactions, pH determinations using

Hydrogen, Quinhydrone and glass electrodes, potentiometric titrations, acid-base titrations, redox and precipitation titrations.

Unit – IV

15 hrs

4.1. Classification of electrochemical cells: Chemical cells and concentration cells with or without transference, liquid junction potential, application of concentration cells, determination of valency of ions, transport number, solubility and solubility product of sparingly soluble salts, activity co-efficient.

4.2. Polarisation: Decomposition potential, over voltage, lead acid battery, fuel cells, H_2-O_2 fuel cells.

Unit – V

15 hrs

5.1. Photochemistry: laws of photochemistry, photophysical and photochemical (primary and secondary) processes, Quantum yield, Abnormal quantum yield- reasons and examples.

5.2. Photochemical kinetics: Kinetics of hydrogen-chlorine and hydrogen-bromine reactions, Decomposition of hydrogen iodide, Fluorescence, Phosphorescence, Chemiluminescence and photosensitisation, Photolysis of aldehydes and ketones.

RECOMMENDED TEXT BOOKS

1. Introduction to Non-equilibrium Physical Chemistry, R. P. Rastogi
2. Principles of Physical Chemistry – Puri, Sharma and Pathania
3. Text Book of Physical Chemistry – P.L.Soni – Sultan Chand
4. Physical Chemistry – Negi and Anand - New Age
5. Physical Chemistry – Kundu and Jain - Sultan Chand
6. Physical Chemistry - P.L.Soni and Dharma
7. Fundamentals of photochemistry – K.K. Rohotgi

REFERENCE BOOKS

1. An Introduction To Electrochemistry by Samuel Glasstone
2. Modern electrochemistry - a fundamentals of electrochemistry by Bockris J.
3. Electrochemistry by Praveen Tyagi
4. Elements of Physical Chemistry (5th Edition) By Peter Atkins and Julio de Paula
5. Essentials of Physical Chemistry (multicolor edition) By Arun Bahl, B.S. Bahl and G.D. Tuli
6. Physical Chemistry (8th Edition) By Peter Atkins and Julio De Paula
7. Modern Molecular Photochemistry” by N J Turro

8. Photochemistry: Past, Present and Future by Angelo Albini

JOURNALS

1. Electrochemistry Communications – Elsevier
2. Journal of applied electrochemistry – Springer
3. Journal of solid state electrochemistry – Springer
4. Journal of photochemistry and photobiology – Wiley

E-LEARNING RESOURCES:

UNIT	E links
I	http://egyankosh.ac.in/bitstream/123456789/7569/1/Unit-8.pdf https://en.wikipedia.org/wiki/Conductivity_(electrolytic) https://en.wikipedia.org/wiki/Ion_transport_number
II	https://chem.libretexts.org/Bookshelves/General_Chemistry/Book%3A_Chem1_(Lower)/11%3A_Chemical_Equilibrium https://www.slideshare.net/KrishnaKumar1406/conductometry-titration
III	https://www.academia.edu/35842541/Equilibrium_Electrochemistry https://en.wikipedia.org/wiki/Electrochemistry
IV	http://ncert.nic.in/textbook/pdf/lech103.pdf https://chem.pg.edu.pl/documents/175289/4235721/Electrochemistry-supplement%20text.pdf
V	https://en.wikipedia.org/wiki/Photochemistry https://www2.chemistry.msu.edu/faculty/reusch/VirtTxtJml/photchem.htm

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Discussed types of conductance and conductors, conductometric & potentiometric titrations and theories related to strong electrolytes
CO 2	Explained conductivity measurements and various theory of electrolytes
CO 3	Explained different types of electrodes, their electrode potentials, emf series and their applications
CO 4	Discussed electrochemical cells, concentration cells and their applications. Designed construction and working principles of batteries and fuel cell
CO 5	Outlined photophysical and photochemical processes and kinetic approach for combination and decomposition of molecules

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
Unit 1	1	2	3	2	3
Unit 2	2	3	2	2	2
Unit 3	2	2	3	1	3
Unit 4	3	2	1	2	3
Unit 5	3	1	2	3	2
AVERAGE	2.2	2.0	2.2	2.0	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

SEMESTER VI

INSTRUMENTAL METHODS OF ANALYSIS- ELECTIVE-III

Total Hrs: 90

Course Code:172316

No. of Credits : 5

COURSE OBJECTIVES:

- To know the different types of spectroscopy.
- To learn the concepts of polarography and chromatography techniques.
- To gain the knowledge of nanoscience.

COURSE OUTLINE

Unit – I

15

hrs

1.1 Polarography: principle, concentration polarization, dropping mercury electrode (DME), advantages and disadvantages, convection, migration and diffusion currents, Ilkovic Equation (derivation not required) and significance, experimental assembly, electrodes, current-voltage curve, oxygen wave, half-wave potential, influence of temperature and agitation on diffusion layer, polarography as an analytical tool in qualitative and quantitative analysis, advantage and application.

Unit – II

15

hrs

2.1 Chromatography: Principle, adsorption, partition column chromatography, adsorbents preparation of column, adsorption, elution, recovery of substance and applications, TLC, choice of adsorbent and solvent, preparation of chromatogram and applications, R_f value, paper chromatography, solvents and principles, factors affecting R_f value, separation of amino acid mixtures, radial paper chromatography.

2.2 Ion-exchange chromatography, principle, resins, actions of resins, experimental techniques, applications, separation of Zn-Mg, Co-Ni, Cd-Zn, chloride-Bromide, Gas chromatography and High pressure liquid chromatography, principles, experimental techniques, instrumentation and application.

Unit – III

15 hrs

3.1. Infrared spectroscopy – principle, types of stretching and bending vibrations, vibrational frequencies, instrumentation, block diagram, source, monochromator, cell sampling techniques, detector and recorders, identification of organic molecules (carboxylic acid, esters, amines only) from characteristic absorption bands.

3.2. Raman spectroscopy – Rayleigh and Raman scattering, Stoke's and Anti-Stoke's line, Instrumentation block diagram, difference between IR and Raman spectroscopy.

Unit – IV

15

hrs

Mass spectroscopy - Basic principles – Instrumentation of Demster`s mass spectrometer, Molecular ion peak, Base peak, Isotopic peak, Meta-stable peak. Nitrogen rule. General fragmentation - Mc-Lafferty rearrangement- Retro Diels- Alder rearrangement. Mass spectra of simple organic compounds, Identification of alcohols, Aldehydes-Ketones, Aromatic Hydrocarbons, Alkenes, Toluenes, Amines.

Unit – V

15

hrs

5.1 ESR Spectroscopy: Principle, Difference between ESR and NMR, ‘g’ factor, Instrumentation, Hyperfine splitting – Methyl radical and Naphthalene radical. Applications of ESR Spectroscopy.

5.2 Nanoscience and Nanotechnology: Introduction, Properties of Nano materials, Surface plasmon resonance (SPR), Synthesis of Nano particle by top down and bottom - up method. Characterisation of Nano particles by SEM and TEM methods (brief ideas only), Applications-Carbon Nano tubes, In Medicine (Cancer Treatment).

RECOMMENDED TEXT BOOKS

1. Analytical Chemistry – R.Gopalan – Sultan Chand.
2. Fundamental of analytical Chemsitry – A.Skoog and West.M.

REFERENCE BOOKS

1. Instrumental methods of analysis – Skoog
2. Quantitative inorganic analysis, Longman.
3. Instrumental methods of analysis - B.K.Sharma – Goel publications.
4. Analytical Chemistry – S. Usharani – Mcmillan.
5. Spectroscopy – Gurdeep Chatwal and Sham Anand.

JOURNALS

1. Anu Mary Ealias and M P Saravanakumar, A review on the classification, characterisation, synthesis of nanoparticles and their application, Mater. Sci. Eng., 2017, .263, 032019.

2. J.Matysik, A.Cięszczyk-Chmiel, J.Chmiel, Thermal effects at the dropping mercury electrode (DME), Journal of Electroanalytical Chemistry and Interfacial Electrochemistry, 1983, 157, 233-240.

E-LEARNING RESOURCES:

1. <https://bitesizebio.com › basics-chromatography-column>
2. <https://www.verivin.com/2016/10/rayleigh-and-raman-scattering>
3. <https://en.wikipedia.org/wiki/Nanoparticle>

COURSE OUTCOMES

CO Number	Course statement
Unit 1	The principles behind polarography are discussed.
Unit 2	Different types of chromatography are explained.
Unit 3	Comparing the IR and Raman spectroscopy.
Unit 4	The basics of mass spectroscopy are analyzed.
Unit 5	To understand the uses of nanotechnology.

MAPPING-COURSES OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
Unit 1	3	3	3	3	3
Unit 2	3	3	3	3	3
Unit 3	3	3	3	3	3
Unit 4	3	3	3	3	3
Unit 5	3	3	3	3	3
AVERAGE	3	3	3	3	3

Key: strongly correlated-3, moderately correlated -2, weakly correlated -1, No correlation-0

Semester-I

ALLIED CHEMISTRY-Theory-Paper-I

[For Physics, Botany, Zoology and N&D Major Students]

Total Hrs: 45

Course Code:172391

No. of Credits : 3

COURSE OBJECTIVES:

- To provide basic knowledge about molecular orbitals and shapes of molecules.
- To give sound knowledge on extraction and purification processes of metals from ore.
- Students get to know about the fundamentals of acid and bases and its application.
- To evaluate isomerism in organic molecules.
- To know about the blood and structure of heme and blood related diseases.

COURSE OUTLINE

Unit-I

9 hrs

Chemical bonding- Molecular Orbital theory- bonding, anti-bonding orbitals, non-bonding orbitals, Bond order – MO configurations of H_2 , He_2 , N_2 , O_2 , F_2 , Paramagnetism and diamagnetism, VSEPR theory - Shapes of H_2O , NH_3 , IF_5 and IF_7 molecules.

Unit-II

9 hrs

Metals- General methods of extraction of metals. Types of ores- Methods of ore dressing reduction methods-type of refining-electrolytic, Van Arkel and zone refining. Role of carbon in the properties of steel, Heat treatment of steel - alloy steels and their uses.

Unit – III

9 hrs

Acid, Base and Salts- Classification of Acid concepts of Acids and Base – Arrhenius, Lowry – Bronsted and Lewis concepts of Acids and Base, pH and its calculation. Buffers and its applications. Simple, double and complex salts – Definition with example

Unit – IV

9 hrs

Isomerisation – Structural Isomerism, Position, chainal Functional Isomerism, Metamerism, Keto – Enol Tautomerism – Definition with examples. Geometrical Isomerism and Optical Isomerism – Definition with examples. Condition for optical activity, Isomerism in tartaric acid, racemisation and resolution.

Blood: Blood composition, grouping, Rh factor, Structure of Heme, Clotting mechanism of blood, pressure-normal, low and high, causes and control, Anaemia – causes, symptoms and treatment, Antianaemic drugs.

RECOMMENDED TEXT BOOKS

6. Allied Chemistry I and II, V. Vaithyanathan.
7. S.F.A. Kettle - Coordination Chemistry.
8. Inorganic Chemistry - Puri and Sharma- Nagin
9. Inorganic Chemistry – Madan – S. Chand
10. Elements of Bio-Inorganic Chemistry - G.N. Mukherjee &Arabindadas.
11. Text Book of Organic Chemistry – P.S. Kalsi – Macmillan
12. Text book of Organic Chemistry – P.L.Soni –Sulthan Chand

REFERENCE BOOKS

1. J.E. Huheey - Inorganic Chemistry - Principles, structure and reactivity.
2. Concise Inorganic Chemistry – J.D.Lee
3. K.F. Purcell and J.C. Kotz - Inorganic Chemistry W.B. Saunders.
4. Advanced Inorganic Chemistry – Cotton and Wilkinson
5. Stereochemistry, conformation and mechanisms – Kalsi – New Age
6. Introduction to biological chemistry – J.Awapara Prentice Hall
7. Biochemistry - A.L. Lehninger
8. Essentials of biological chemistry – James Fanley – East West press

JOURNALS

5. J. of Inorganic chemistry
6. J. of Coordination Chemistry
7. J. of Organic Chemistry

E-LEARNING RESOURCES:

UNIT 1

<https://www.khanacademy.org/science/biology/chemistry--of-life/chemical-bonds-and-reactions/v/ionic-covalent-and-metallic-bonds>

<https://www.youtube.com/watch>

UNIT 2

<https://www.sciencedirect.com/topics/engineering/metal-extraction>

<https://www.bbc.co.uk/bitesize/guides/z3v9msg/revision/>

UNIT 3 <https://www.toppr.com/guides/chemistry/equilibrium/>

UNIT 4 <https://www.compoundchem.com/2014/05/22/typesofisomerism/>

<https://www.toppr.com/guides/chemistry/organic-chemistry/isomerism/>

UNIT 5 <https://www.ncbi.nlm.nih.gov/books/NBK2263/>

COURSE OUTCOMES

CO Number	CO STATEMENT
CO 1	To predict the structure of molecules by applying molecular orbital theory.
CO 2	To analyze and explore new purification processes of metals in industries.
CO 3	To apply the use of acid and bases in daily life such as sewage treatment, etc.
CO 4	Students design and predict different isomerism in molecules.
CO 5	To know about blood and create awareness about blood related diseases.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	3
CO2	3	2	1	3	2
CO3	1	2	2	2	3
CO4	2	1	3	1	1
CO5	3	2	1	3	2
AVERAGE	2	3	3	2	3

Semester-II

ALLIED CHEMISTRY-Theory-Paper-II

[For Physics,Botany,Zoology and N&D Major Students]

Total Hrs:45

Course Code:173292

No. of Credits : 3

COURSE OBJECTIVES:

- To know about carbohydrates.
- To create awareness about therapy for health problem.
- To know about coordination chemistry.
- To give sound knowledge on fuel gases and fertilizers.
- To give strong knowledge about the laws and reactions in photochemistry.

COURSE OUTLINE

Unit – I

9 hrs

Carbohydrates

Classification-properties of glucose and fructose-(Open chain structure only). Properties and uses of starch, cellulose and their derivatives.

Unit – II

9 hrs

Chemotherapy

Analgesics, Antipyretics – Definition and examples. Anaesthetics, local anaesthetics and general anaesthetics. Causes and treatment of diabetes, cancer and AIDS. Antiseptics and Disinfectants - Definition and examples

Unit – III

9 hrs

Coordination chemistry

Nomenclature, Sidgwick theory, EAN rule, Werner theory. Example and effect of chelation. Chemistry of EDTA, haemoglobin and chlorophyll.

Industrial chemistry

Fuel gases-natural gas, water gas, semi-water gas, carbureted water gas, producer gas, oil gas [composition and uses only]. Synthesis, properties and uses of silicones. Fertilizers-Preparation and uses of Urea, Ammonium Sulphate, Super phosphate, triple super phosphate and NPK fertilizers.

Unit-V

9 hrs

Photochemistry

Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence. Quantum yield. Examples for photochemical reaction-hydrogen-chlorine reaction, photosynthesis, phosphorescence, fluorescence, chemiluminescence and photosensitization-definitions with example.

RECOMMENDED TEXT BOOKS

1. Allied Chemistry I and II, V. Vaithyanathan.
2. S.F.A. Kettle - Coordination Chemistry.
3. Inorganic Chemistry - Puri and Sharma- Nagin
4. Inorganic Chemistry – Madan – S. Chand
5. Elements of Bio-Inorganic Chemistry - G.N. Mukherjee & Arabindadas.
6. Text book of Organic Chemistry – P.L.Soni – Sulthan Chand
7. Industrial Chemistry – B.K. Sharma

REFERENCE BOOKS

1. J.E. Huheey - Inorganic Chemistry - Principles, structure and reactivity.
2. Concise Inorganic Chemistry – J.D.Lee
3. K.F. Purcell and J.C. Kotz - Inorganic Chemistry W.B. Saunders.
4. Advanced Inorganic Chemistry – Cotton and Wilkinson
5. Introduction to biological chemistry – J.Awapara Prentice Hall
6. Essentials of biological chemistry – James Fanley – East West press
7. Advanced General Organic Chemistry- Sachin K.Ghosh- books (P) ltd
8. Chemical Process Industries – Norris Shreve Joseph A. Brink

JOURNAL

J. Carbohydrate Research
J. Coordination Chemistry

E-LEARNING RESOURCES:

UNIT 1

<https://en.wikipedia.org/wiki/Carbohydrate>

UNIT 2

<https://www.healthline.com/health/chemotherapy>

UNIT 3

https://en.wikipedia.org/wiki/Coordination_complex

UNIT 4

<https://www.cooperativepatentclassification.org/cpc/definition/C/definition-C10J.pdf>

UNIT 5

<http://photobiology.info/Photochem.html>

COURSE OUTCOME

CO Number	CO STATEMENT
CO 1	To know and explain the classification of carbohydrates and its uses.
CO 2	To apply the remedies of health problem.
CO 3	Get clear outline about coordination complexes.
CO 4	To apply the knowledge of fuel gases in industries.
CO 5	Would be able to predict and analyze photochemical reactions.

MAPPING – COURSE OUTCOME WITH

PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	3
CO2	3	2	3	2	1

CO3	1	3	2	3	2
CO4	2	2	1	1	2
CO5	3	2	3	2	3
AVERAGE	2	3	2	3	3

MAJOR CHEMISTRY PRACTICALS

Total Hrs: 90

Course Code:172304

No. of Credits : 4

COURSE OBJECTIVES:

- To enable the students to develop practical analytical skills in Inorganic qualitative analysis.
- To understand the preparation of certain Inorganic compounds.

COURSE OUTLINE

Practical – 1: Qualitative Analysis (at the end of second semester)

Analysis of a mixture containing two cations and two anions, one of which will be interfering ion. Semi micro methods using the conventional scheme may be adopted.

Reactions of the following anions to be studied: carbonate, sulphide, sulphate, chloride, bromide, nitrate, oxalate, phosphate, borate

Reactions of the following cations to be studied: lead, copper, cadmium, bismuth, aluminium, iron, manganese, zinc, cobalt, nickel, calcium, strontium, barium, magnesium, ammonium.

Preparation of inorganic compounds

RECOMMENDED TEXT BOOKS

1. Inorganic semimicro qualitative analysis, V.V. Ramanujam, The National publishing company, Ed:3, 2007

REFERENCE BOOKS

2. V. Venkatesan, R. Veeraswamy, A.R. Kulandaivelu, Basic Principles of Practical Chemistry, S.Chand and Sons, 2004.

JOURNALS

1. <http://scholar.google.co.in/scholar?cluster=15780547281211466133&hl=en&oi=scholar>
2. <https://journals.sagepub.com/home/ijq>

E-LEARNING RESOURCES:

1. <http://www.slu.edu/organizations/grc/QRjournals.html>
2. https://www.researchgate.net/journal/1468-7941_Qualitative_Research
3. <https://pubs.acs.org/doi/abs/10.1021/ed009p966>
4. https://www.mdpi.com/journal/inorganics/special_issues/inorganic-synthesis
5. <https://onlinelibrary.wiley.com/series/2146>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Create the knowledge of Inorganic qualitative analysis.

CO 2	Utilize the concept behind the preparation of certain Inorganic compounds.
CO3	Discuss the concept of qualitative analysis
CO4	Create safety responsibilities related in working with chemical systems.
CO5	Utilize the skills in the scientific method of planning, developing, conducting, reviewing and reporting experiments.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	3	3	3	3
CO 2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

PRACTICAL -2: VOLUMETRIC ESTIMATION

(Examination at the end of fourth semester)

Total Hrs: 90

Course Code:172308

No. of Credits : 4

COURSE OBJECTIVES:

- To learn and practice different qualitative analysis
- To know about normality, molarity, equivalent weight

- To standardize sodium hydroxide, ferrous sulphate, etc.
- To determine the concentration of unknown substances.

COURSE OUTLINE

Acidimetry

1. Estimation of sodium hydroxide using standard sodium carbonate.
2. Estimation of borax using standard sodium carbonate.

Permanganometry

3. Estimation of ferrous sulphate using std. ferrous Ammonium sulphate.
4. Estimation of oxalic acid using std. Mohr's salt or ferrous sulphate.
- 5.*Estimation of calcium.

Iodimetry

6. Estimation of arsenious oxide.

Iodometry

7. Estimation of copper using Std. Potassium dichromate
8. Estimation of Potassium dichromate using Std. Copper sulphate.

Complexometry

9. Estimation of zinc using using EDTA.
10. Estimation of magnesium using EDTA.
- 11.*Estimation of total hardness of water.

Dichrometry

12. Estimation of ferrous ion using diphenyl amine as indicator.

13.*Estimation of ferrous ion using external indicator.

*Not for examination

RECOMMENDED TEXT BOOKS

1. Text book of Macro and semi micro qualitative Inorganic analysis - Vogel
2. A Text-book of Volumetric Analysis, Henry William Schimpf, J. Wiley & sons, 1868.

REFERENCE BOOKS

1. Vogel's handbook of quantitative inorganic analysis – Longman
2. Volumetric Analysis: Concepts and Experiments, Fultariya Chirag
3. A Systematic Handbook of Volumetric Analysis, Sutton Francis

JOURNALS

1. Qualitative and volumetric analysis
2. JAMA Journal.

E-LEARNING RESOURCES:

JAMAnetwork.com/journals/jama/fullarticle/305140

<https://pubs.acs.org/doi/abs/10.1021/ja02051a019>

COURSE OUTCOME

CO Number	CO STATEMENT
CO 1	Students get idea about different titration methods involved in volumetric analysis.
CO 2	Students can standardize various solutions
CO 3	Estimate (evaluate) the amount of substance present in a given solution.
CO 4	Students apply the skill in doing titration.
CO 5	Utilize these skills in industry.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOM

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	2	3
CO2	3	2	2	3	2
CO3	2	3	3	1	2
CO4	3	1	2	3	3
CO5	1	3	1	2	1
AVERAGE	3	3	2	3	2

PRACTICAL - 3: PHYSICAL CHEMSITRY

(Examination at the end of sixth semester)

Total Hrs: 90

Course Code:172317

No. of Credits : 4

COURSE OBJECTIVES:

- The course provides training in advanced physical chemistry laboratory techniques.

- The experiments are guided by demonstrators and are designed both to illustrate applications of theory covered in the Chemical Physics and lecture courses, and to introduce typical instrumentation.
- The investigation provides an introduction to research methods.

COURSE OUTLINE

1. Distribution law

Determination of partition coefficient of iodine between

Carbon tetrachloride and water.

2. Kinetics: Determination of the orders of the following reactions.

- a. Acid catalysed hydrolysis of an ester (methyl or ethyl acetate).
- b. Iodination of acetone.
- c. Kinetics of Potassium persulphate- Potassium iodide reaction.

3. Molecular weight of a solute

Rast's method using naphthalene, metadinitrobenzene and diphenyl as solvents.

4. Heterogeneous equilibria:

Phenol – Water system –CST.

5. Effect of impurity

Determination of concentration of given NaCl solution in phenol water system.

6. Determination of the transition temperature of the given salt hydrate

$\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$, $\text{CH}_3\text{COONa} \cdot 3\text{H}_2\text{O}$, $\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$

7. Electrochemistry

(i) Conductivity

- a. Determination of cell constant and equivalent conductivities of solutions of two different concentrations.
- b. Conductometric titration of strong acid against a strong base.

(ii) Potentiometric titration of a strong acid against strong base

RECOMMENDED TEXT BOOKS

1. V. Venkatesan, R. Veeraswamy, A.R. Kulandaivelu, Basic Principles of Practical Chemistry, S.Chand and Sons, 2004.
2. Physico- chemistry techniques of analysis - P.B. Janarthnam – Vol- I and II Asian

Publishing

REFERENCE BOOKS

1. Vogel's handbook of quantitative analysis – Longman
2. Applied Chemistry – theory and practicals – O.P. Vermani

JOURNALS

1. Journal of chemical education <https://pubs.acs.org/doi/abs/10.1021/ed040p26>
2. Journal of physical chemistry
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0203558>
3. International journal of energy & environmental engineering
<https://link.springer.com/article/10.1007/s40095-017-0230>
4. Journal of material chemistry A
<https://pubs.rsc.org/en/journals/journalissues/ta#!recentarticles&adv>

E-LEARNING RESOURCES:

UNIT	E links
1	https://chem.libretexts.org/Ancillary_Materials/Laboratory
2	https://www.ch.ntu.edu.tw/~genchem99/doc/presentation/potentiometric-titration-of-acid-base-en.pdf
3	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4795599/
4	https://www.researchgate.net/publication/313828183_Conductometric_titration

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Developed an understanding of the breadth and concepts of
CO 2	An appreciation of the role of physical chemistry in the chemical sciences and engineering
CO 3	Developed an understanding of the role of the chemist and chemical engineer in tasks employing physical chemistry

CO 4	Developed skills in the scientific method of planning, developing, conducting, reviewing and reporting experiments
CO 5	Developed some understanding of the professional and safety responsibilities residing in working with chemical systems.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	1	3	2
CO2	2	2	3	3	1
CO3	3	3	2	1	1
CO4	1	3	3	1	2
CO5	3	1	2	2	3
AVERAGE	2.4	2.2	2.2	2	1.8

- KEY:STRONGLY CORRELATED-3 MODERATELY CORRELATED-2WEAKLY CORRELATED-1 NO CORELATION-0

PRACTICAL-4 : GRAVIMETRIC ESTIMATION

(Examination at the end of sixth semester)

Total Hrs: 90

Course Code:172318

No. of Credits : 4

COURSE OBJECTIVES:

- To create knowledge about the estimation of inorganic compounds
- To estimate certain inorganic compounds using silica crucibles
- To analyse and estimate certain inorganic compounds using sintered crucibles

COURSE OUTLINE

1. *Determination of Water of hydration of the given hydrated salt.
2. Estimation of sulphate as Barium sulphate.
3. Estimation of barium as Barium sulphate.
4. Estimation of barium as Barium chromate.
5. Estimation of lead as Lead chromate.
- 6.* Estimation of nickel as DMG complex.
7. *Estimation of calcium as Calcium oxalate monohydrate.
- 8.*Estimation of copper as Cuprous thiocyanate.

*Not for examination

RECOMMENDED TEXT BOOKS

1. J. *Vogel's Textbook of Quantitative Inorganic Analysis*, Longman: London, 4th Ed., 1981, p. 408 Bassett, J.; Denney, R. C.; Jeffery, G. H. Mendham.
2. Quantitative Analysis-V.Alexeyev.

REFERENCE BOOKS

1. A Text book of quantitative chemical analysis-J.C.Olsen, D.Van Nostrand Company
2. Gravimetric Analysis Of Analytical Organic Chemistry-Erick Lewis Hardcover – 2014
3. Quantitative Analysis 6th Edition - A L Underwood, R A Day
- 4.A Text-Book of Quantitative Chemical Analysis- Oslen John Charles
5. Gravimetric Analysis, Part II-L.Erdey

JOURNALS

1. Gordon, L.; Salutsky, M. L.; Willard, H. H. *Precipitation from Homogeneous Solution*, Wiley: NY, 1959.
2. Ward, R., ed., *Non-Stoichiometric Compounds* (Ad. Chem. Ser. 39), American Chemical Society: Washington, D. C., 1963.

E-LEARNING RESOURCES:

1. <https://chem.libretexts.org>

2. www.khanacademy.org/

3. <https://open.umn.edu>

4. <https://archive.org> ›

5. <https://www.sciencedirect.com>

COURSE OUTCOME:

CO Number	CO STATEMENT
CO1	To explain the inorganic substance is y estimated quantitatively by gravimetric method
CO2	To create wide knowledge about the estimation of inorganic compounds
CO3	To discuss about the few inorganic compounds are quantitatively estimated using silica crucible
CO4	To compile the accuracy during estimation of inorganic compounds
CO5	To discuss about the few inorganic compounds are quantitatively estimated using sintered crucible

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	3
CO2	3	2	3	1	2
CO3	2	2	3	3	2
CO4	2	1	3	3	3
CO5	3	3	2	3	3
AVERAGE	2.4	2.0	2.6	2.4	2.6

Practical- 5 : Organic Analysis and Preparation

(Examination at the end of sixth semester)

Total Hrs: 75

Course Code:

No. of Credits : 4

COURSE OBJECTIVES:

- Justify the systematic analysis of organic compound
- Characterize and identify the presence of the functional groups
- Confirmatory test is conducted to confirm the functional groups
- Derivatives of the concerned functional group is prepared
- To prepare the organic substances in a single step process

COURSE OUTLINE

Systematic **analysis of an organic compounds**, containing one functional group and characterisation by confirmatory tests and derivatives:

Reactions of the following functional groups:

Aldehyde, ketone, carboxylic acid (mono, di), ester,

Carbohydrate (reducing sugar), diamide, phenol, aromatic primary amine, amide, nitro compound and anilide.

Organic preparation involving

1. Oxidation (benzaldehyde to benzoic acid).
2. Hydrolysis (methyl salicylate to acid).
3. Nitration (metadinitrobenzene to picric acid).
4. Diazotisation (methyl orange).
5. Acylation (benzoylation to α -naphthol).
6. Esterification.

RECOMMENDED TEXT BOOKS

1. [Vogel's Textbook of Quantitative Chemical Analysis \(5th Edition\) By G. H. Jeffery, J. Basset, J. Mendham and R. C. Denny](#)
2. Semi micro qualitative analysis – Ramanujam
3. Advance Practical Inorganic Chemistry - dr. Gurdeep Raj
4. Vogel's handbook of quantitative inorganic analysis – Longman

REFERENCE BOOKS

1. Instrumental methods of analysis – Skoog
2. Text book of Macro and semi micro qualitative Inorganic analysis m- Vogel

Journals

1. [Organic Compost Preparation and Methods | Asia Farming](#)
2. [Organic & Inorganic Chemistry Journals | Open Access](#)
3. [Functional Group Analysis | Journal of Chemical Education](#)
4. [Journal of Functional Analysis | ScienceDirect.com](#)
5. [Organic Functional Group Analysis | ScienceDirect](#)

E-LEARNING RESOURCES:

Organic	E Links
Organic analysis of functional groups	https://www.bookrix.com >book
	https://www.scribd.com >doc>org
	https://www.toppr.com >chemistry

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Identified analysis of organic compound
CO 2	Compared the presence of the functional groups
CO 3	Analysed the confirmatory test for the functional groups
CO 4	Prepared the derivatives of the concerned functional group
CO 5	Selected the preparation method of the organic substances in a single step process

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	3	2	3
CO2	3	1	3	3	2
CO3	2	3	1	3	3
CO4	3	3	2	2	3
CO5	3	2	3	3	1
AVERAGE	3	2	2	3	2

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY
CORELATED-1 NO CORELATION-0

ALLIED CHEMISTRY PRACTICALS

(for physics, botany, zoology, N&D major students)

Total Hrs:

Course Code:

No. of Credits

COURSE OBJECTIVES:

To learn and understand the principles behind the qualitative and quantitative estimation of organic and inorganic substances

COURSE OUTLINE

Volumetric analysis

1. Estimation of Sodium Hydroxide using std. Sodium Carbonate
2. Estimation of HCl using std. Oxalic acid
3. Estimation of Borax using std. Sodium Carbonate
4. Estimation of Ferrous Sulphate using std. Mohr's salt(FAS)
5. Estimation of Oxalic acid using std. Ferrous Sulphate

Organic analysis

Systematic analysis of organic compounds, containing one functional group and characterisation by confirmatory tests-Reaction of carbohydrate, carboxylic acid(aromatic mono, di) phenol, aromatic primary amine and aliphatic diamide.

RECOMMENDED TEXT BOOKS

1. Text book of Macro and semi micro qualitative organic analysis m- Vogel
2. V. Venkatesan, R. Veeraswamy, A.R. Kulandaivelu, Basic Principles of Practical Chemistry, S.Chand and Sons, 2004.

REFERENCE BOOKS

1. Semi micro qualitative analysis – Ramanujam
2. Vogel's handbook of quantitative inorganic analysis – Longman

JOURNAL

1. Journal of chemical education <https://pubs.acs.org>

2. International journal of science <https://www.nature.com/articles/>

E-LEARNING RESOURCES:

UNIT	E links
I	https://chem-guide.blogspot.com/2010/04/qualitative-analysis-of-organic.html
II	https://www.sciencedirect.com/science/article/pii/S1015958418306456

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	The hands on exercise undergone by the students will help them to apply chemical principles to evaluate the given substances.
CO 2	Students calculated the results of volumetric analysis

➤ MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
AVERAGE	3	3	3	3	3

- KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1 NO CORELATION-0

QUAID-E-MILLATH GOVT. COLLEGE FOR WOMEN

(Autonomous)

Anna salai, Chennai - 600 002.

**M.Phil. PLANT BIOLOGY AND
PLANT BIOTECHNOLOGY**

SYLLABUS



OFFERED FROM THE ACADEMIC YEAR 2017-2018

PROGRAMME SPECIFIC OUTCOME

The MPhil course will enable the students to:

PSO 1:

Obtain a general account on distribution pattern, classification, visualisation and quantification of micro and macro flora.

PSO 2:

The qualitative and quantitative estimation techniques of biomolecules and mass cultivation of micro-flora for commercial use.

PSO 3:

Acquire knowledge on bio-monitoring agents with emphasis on degradation of xenobiotics and antibiotics using analytical techniques

PSO 4:

Understand the instrumentation of phyto-chemistry and commercial values of bioactive metabolites.

PSO 5:

Acquire knowledge on applied aspects of enzymology, histology, preservation of medicinal plants using molecular techniques.

DEPARTMENT OF PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

It is resolved to pass the same syllabi (students admitted since 2017 -18) for **M.Phil** in Plant Biology and Plant Biotechnology for the students admitted during the academic year 2017– 2018.

M.Phil - SYLLABUS- 2017 – 2018

SEMESTER	SUBJECT CODE	TITLE OF THE PAPER	SEM MARKS
I	171801	<u>PAPER - I</u> Research Methodology	100
I	171802	<u>PAPER - II</u> Applied Plant Biology and Plant Biotechnology	100
I	171803A	<u>PAPER - III</u> Ecology of Algae	100
I	171803B	Advance Studies in Fungi	100
I	171803C	Applied Microbiology	100
I	171803D	Applied Cytogenetics	100
I	171803E	Phytochemistry of Medicinal Plants	100
I	171803F	Plant Anatomy and Micro-technique Studies	100
II	171804	PROJECT	100

M.Phil DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018

PAPER - I RESEARCH METHODOLOGY

COURSE OBJECTIVES

- ❖ To know the basic microbiological techniques
- ❖ To enable the understanding of basics of biochemistry
- ❖ To learn the various cell separation techniques
- ❖ To understand the different chromatographic techniques and their applications.
- ❖ To acquire knowledge on conventional and modern methods of enzymology along with computerised data analysis.

COURSE OUTLINE

UNIT – I

General Microbiological techniques (Cleaning of glassware, preparation of media, sterilization, etc). Isolation and pure culture of bacteria, fungi and algae. Maintenance of culture and herbaria. Microscopy: principles and application. Phase contrast, Dark field Fluorescence microscopy, and Transmission and Scanning Electron microscopy, Photo microscopy. Micrometry – Dynamics of growth and its measurement, methods of bioassay (Trace elements, antibiotics, vitamins)

UNIT – II

pH, Buffer and Buffer action: aqueous acid and base theories. Strong acids and bases – neutralization, preparation of standard solution. Weak acids and bases and their salts. Preparation of common buffers (Potassium phosphates, Tris and acetate buffers). pH measurement – types of electrodes, glass and combined electrode, principles of operation, ion – specific electrode.

UNIT – III

Cell fractionation methods – solid shear, liquid shear, high pressure extrusion and ultrasonic oscillation. Isolation of chloroplasts, mitochondria and cell membranes. Use of proper osmotics for preserving integrity of organelles. Manometric and polarographic technique, Oxygen electrodes. Centrifugation: Ultra centrifuge – Preparative and analytical – Density gradient and Zonal centrifugation, buoyant density determination.

UNIT – IV

Chromatographic techniques – Principles and applications. Column, thin layer, paper and gas chromatography, gel filtration, ion exchange and high performance liquid chromatography (HPLC). Electrophoresis techniques : General principles. Factors affecting electrophoresis sample buffer electro field. Low and High voltage Electrophoresis. Gel Electrophoresis – agarose and polyacrylamide gels. Determination of molecular weights – use of sodium dodecyl sulphate, polyacrylamide gel

electrophoresis. Isoelectric focusing and Iso electrophoresis. Dialysis and Lyophilization.

UNIT – V

Extraction, purification and assay of enzyme: Localisation of enzymes and compartmentation, methods of studying compartmentation in cells, special requirements for enzyme extraction from plant cell. Colorimetry and Spectrophotometry : Fluorescence, flame photometer, atomic absorption.

Isotope methodology: Geiger Muller counter, Gas flow and liquid scintillation system, autoradiography. Molecular biological techniques – PCR, RFLP, RAPD

Analysis and presentation of data: Statistical method tables, graphs, histograms averages, standard deviation, tests of significance, Use of calculating devices.

Information retrieval - Preparation of manuscripts. Use of computers in biology, Internet, e- Journal.

REFERENCE BOOKS

1. Ridgman, W.J. 1975. Experimentation in Biology. Blackie, London.
2. Krishnamoorthy, R. 1994. Computer programming and application. J.J. Publication, Madurai.
3. Sundara Rao and J. Richard, 1999. An introduction to Bio statistics. Prentice hall of India Pvt. Ltd., New Delhi.
4. Hoffmar, 1996. The Internet – instant Reference. BPB Publication, New Delhi.
5. Kumar, H.D. 1998. A textbook of Biotechnology affiliated – East – West press Pvt. Ltd., New Delhi.
6. Gurumani. N. Research methodology for Biological Sciences, MJP Publishers, Chennai.
7. Ralph, Methods in Experimental Biology.
8. Richard. W. Van. Norman. Experimental Biology

JOURNALS

1. Journal of Mixed Methods Research
2. International Journal of Qualitative Research Methods

E – LEARNING RESOURCES

1. <https://www.biotopics.co.uk/microbes/tech1.html>
2. <http://www.biologydiscussion.com/micro-biology/laboratory-equipment>
3. <https://www.discoveryscientificsolutions.com/item>
4. <https://www.khanacademy.org/test-prep/mcat/chemical-processes/separations-purifications>
5. <https://cmjournal.biomedcentral.com/articles>

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
CO 1	Master the general techniques related to microbiology
CO 2	Recollect the basics of biochemistry
CO 3	Learn about the various techniques facilitating cell and organelle studies
CO 4	Learn the analytical techniques employed for separation of biomolecules.
CO 5	Learn the basics of statistics and employ it for computerised data analysis

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	3	3	2	2
CO 2	3	3	2	2	3
CO 3	2	2	3	2	3
CO 4	2	3	2	3	2
CO 5	1	3	2	3	3
AVERAGE	2.2	2.8	2.4	2.4	2.6

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**M.Phil DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018**

PAPER –II APPLIED PLANT BIOLOGY AND PLANTBIOTECHNOLOGY

COURSE OBJECTIVES

- ❖ To understand the common characters of specific plant forms.
- ❖ To stress the useful applications of lower plant forms and microbes
- ❖ To teach the importance of pollution indicator plants with the help of remote sensing
- ❖ To learn the qualitative characterization of plant metabolites
- ❖ To learn the application of tissue culture techniques in crop improvement

COURSE OUTLINE

- UNIT-I** General characters of algae, bacteria , fungi, virus and mycoplasma.
- Study on Sphagnum, Azolla, Taxus, Ephedra and Azadiracta.
- UNIT –II** Single cell protein (SCP). Seaweed liquid fertilizers.Mass cultivation Of Spirulina, Gracilaria, Kappaphycus. Cultivation of Agaricus, study, on Mycorrhiza- Role of fungi in industries and medicine- Alcohol And Organic acids, Antibiotics.
- UNIT-III** Indicator Plants. Agro And Social forestry, Phytogeographical regions of Tamil Nadu. Remote sensing Applications.
- UNIT-IV** Importance of Medicinal Plants. Phytochemical screening of Alkaloids and Flavonoids. Sacred plants- Endangered medicinal plants-Herbal Gardens- Conservation.
- UNIT-V** Micropropagation- somatic embryogenesis- Protoplast culture. Techniques Aroidopsis. Role of biotechnology in crop improvement.

REFERENCES

- Fogg, G.E. 1975 Algal culture and phytoplankton Ecology, Second Edition, University of Wisconsin, Madison.
- Pelczar and Reid. 1986. Microbiology.Tata McGraw Hill
- Chapman. V.J. and Chapman D.J. 1980. Seaweeds and their uses. Chapman and Hall London.
- Chopra, R.N.& Kumar, P.K. 1988. Biology of Bryophyta. Wiley Eastern
- Vashista,B.R. 1987. Pteridophytes, S. Chand and Co., New Delhi.,

- Vashista, B.R. 1987. Gymnosperms, S. Chand and Co., New Delhi
- Purobit S.S and S.K. Mathur, 1999. 2nd Ed. Biotechnology Acta Botanica, Bikaner, India.K
- Kumar, H.D. 1993. Molecular Biology and Biotechnology, Vikas, Delhi. John Jothi Prakash. E. 2003. Medicinal and Aromatic Plants. J.P.R. Publications, Tirunelveli.
- John Jothi Prakash. E. 2004. Medicinal Botany and Pharmacognosy. J.P.R. Publications, Tirunelveli.

JOURNALS

1. International Journal of Applied Biology and Pharmaceutical Technology
2. Journal of Applied Biology and Biotechnology

E – LEARNING RESOURCES

1. <https://www.livescience.com>
2. <https://www.slideshare.net>
3. <https://environmentofearth.wordpress.com/tag/pollution-indicator-plants>
4. <https://nurserylive.com/32-medicinal-plants>
5. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/micropropagation>

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
CO 1	Acquire knowledge on general characters of plant forms
CO 2	Learn the uses of lower plant forms and microbes
CO 3	Appreciate the importance of pollution indicators
CO 4	Acquire knowledge on estimation of secondary metabolites
CO 5	Understand the plant tissue culture techniques in crop improvement/

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	3	3	2	2
CO 2	3	3	2	2	3
CO 3	2	2	3	2	3
CO 4	2	3	2	3	2
CO 5	1	3	2	3	3
AVERAGE	2.2	2.8	2.4	2.4	2.6

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**M.Phil DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018**

PAPER –III ECOLOGY OF ALGAE

COURSE OBJECTIVES:

- ❖ To understand the distribution of algae in various ecosystems
- ❖ To teach the methodology of algal cultivation and identification
- ❖ To appreciate the interrelation between algae and environment.
- ❖ To obtain knowledge on the commercial values of algae
- ❖ To acquire information on the enzymology of algae and their industrial uses.

COURSE OUTLINE

- UNIT I** Distribution Pattern of algae in relation to different habitats- chief factors governing distribution of algae and primary productivity. Inter relationships between physio-chemical properties, biota- fresh water, lentic, lotic, permanent and temporary. Marine and estuarine environments, planktonic and benthic algae.
- UNIT II** Collection and identification of algae- preparation of media for culturing algae. Mass cultivation of micro and macro algae, Single cell protein – Algae in closed systems.
- UNIT III** Role of algae in environment and health, in sewage treatment and in the treatment – industrial effluents – Algae as indicators of environmental pollution. Algae as a source food and feed – Algae as industrial raw materials.
- UNIT IV** Extraction of phycocolloids, algin, agar agar, carrageenan and pigments - Carotene extraction from *Dunaliella* species. Extraction of bioactive compounds.
- UNIT V** Isolation of seaweed associated bacteria. Bacterial Culture, Isolation and Screening and Production of protease enzyme. Industrial importance of Protease enzyme. Study of agarose enzyme.

REFERENCE BOOKS

1. Baddoley, S.Carey, N.H.Higgins, I.J.and Potter, W.G. 1994. Microalgae: Biototechnology and Microbiology. Cambridge University Press, Cambridge.

2. Becker. E.W. 1994. Microalgae: Biotechnology and Microbiology. Cambridge University Press.
3. Borowitzka. M.A. and Borowizka.L.J. 1996. Microalgal Biotechnology. Cambridge University Press.
4. Chapman, V.J and Chap man D.J. 1980. Seaweeds and their uses. Chapman and Hall London.
5. Fritsch, F.E. 1935, 1945. The structure and reproduction of algae Vol-I and Vol – II, Cambridge University Press.

JOURNALS

1. Journal of Ecology
2. International Journal of Environmental Pollution

E – LEARNING RESOURCES

1. <https://www.coursera.org>lecture>
2. <https://www.sepro.com/stewards-of-water/archive/algae>
3. <https://www.microscopemaster.com/algae.html>
4. <http://www.seaweed.ie/algae/seaweeds.php>
5. <https://www.scitechnol.com/scholarly/environmental-pollution-journals-articles-ppts-list.php>

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
CO 1	Acquire knowledge on ecological algal distribution
CO 2	Learn the methodology of cultivation of algae and their identification
CO 3	Understand the interrelation between algae and their ecosystem
CO 4	Learn the economic importance of algae and their metabolites
CO 5	Learn the applications of algal enzymes.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	3	2	2
CO 2	3	3	2	3	3
CO 3	3	3	3	2	2
CO 4	2	2	3	3	3
CO 5	2	2	3	3	3
AVERAGE	2.6	2.4	2.8	2.6	2.6

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**M.Phil DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018**

PAPER –III ADVANCED STUDIES IN FUNGI

COURSE OBJECTIVES:

- ❖ To teach the Classification of fungi and their phylogenetic relationships
- ❖ To learn the techniques of cultivation of fungi
- ❖ To know the impact of xenobiotics and their degradation using fungi.
- ❖ To understand the ecological relations of fungi and their metabolites
- ❖ To study the applications of fungi in various fields.

COURSE OUTLINE

- UNIT I** Nomenclature of fungi- Classification of Fungi- proposed by Ainsworth. Modern systems of Fungal classification. Phylogeny of fungi
- UNIT II** Isolation and Pure culture of Fungi, Growth of Fungi on different types of culture media. Cultivation of fungi as source of protein and as feed.
- Unit III** Degradation of xenobiotics and their impact on environment (Pesticides textiles, dyes, hydrocarbons, herbicides etc). Degradative enzymes of fungi.
- Unit IV** Ecology of Fungi – Soil fungi, aquatic fungi, entomogenous fungi, corophilous fungi. Physiology and nutrition – Primary and secondary metabolites.
- Unit V** Fungi in Partnership with other organisms – mycorrhiza – ecto and endomycorrhiza – VAM fungi – Applications. Role of Fungi in Industries – alcohol and organic acid production – Role of Fungi in medicines.

REFERENCE BOOKS

1. Burnett.J.M, 1976. The fundamentals of mycology. Arnold Co. IInd. London.
2. Webster. I. 1988. The Fungi cup, Cambridge University Press.
3. Alexpoulos. C.J., C.W.Mims and M. Blackwell 2013. Introductory Mycology, Wileys, New Delhi.
4. Sharma. P.D. 1989. The Fungi, Rastogi Publication, Merrut.
5. R. Vashita, A.K.Sinha, 2012. Botany for Degree Students Fungi, S.Chand& Company Ltd., New Delhi.
6. GeetaSumbali, 2012. The Fungi. Satya book house, Chennai.

JOURNALS

1. Italian Journal of Mycology
2. International Journal of Mycology

E – LEARNING RESOURCES

1. <https://www.Pressbooks.dev.oer.hawaii.edu/biology/chapter/classification-of-fungi/>
2. <https://www.studocu.com/en/document/jagannath-university/mycology/lecture-notes/cultivation-of-fungi>
3. <http://watcut.uwaterloo.ca/webnotes/Metabolism/DrugMetabolism.html>
4. https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book
5. <http://www.countrysideinfo.co.uk/fungi/importce.htm>

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
CO 1	Learn the fungal classification and their phylogenetic relationships
CO 2	Learn the isolation and culture techniques of fungi
CO 3	Acquire knowledge on degradative abilities of fungi
CO 4	Learn about the impact of fungi in the respective ecosystem
CO 5	Learn the industrial and medicinal applications of fungi.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	2	2	2
CO 2	3	3	2	2	3
CO 3	3	3	3	2	2
CO 4	2	2	3	3	3
CO 5	2	2	3	3	3
AVERAGE	2.6	2.4	2.6	2.4	2.6

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**M.Phil DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018**

PAPER –III APPLIED MICROBIOLOGY

COURSE OBJECTIVES

1. To teach the techniques of visualization of microbial cells
2. To study the morphological variation and cultivation of microbes
3. To enable the learning of microbial resistant mechanisms
4. To teach the basics of food microbiology
5. To enable the learning of aeromicrobiology

COURSE OUTLINE

UNIT I

Staining Techniques- smear preparation, Gram's staining, Acid fast Staining, Metachromatic staining, cell wall staining, spore staining. Media Preparation – demonstrate enzymatic activities.

UNIT II

Morphological variation in bacteria, Fungi, actinomycetes, algae and protozoa. Purification and maintenance of microbes. Spread plate, single spore isolation, slide culture technique.

Unit III

Isolation of plasmid DNA and Chromosomal DNA, development of competent cells in *E.Coli*. Isolation of antibiotic resistant auxotrophic mutants.

Unit IV

Importance of studying food and dairy microbiology. Factors influencing microbial growth in foods – extrinsic and intrinsic factors. Therapeutic and nutritional value of fermented foods – milk borne infection.

Unit V

Airborne transmission of microbes and study of isolation of airborne micro flora. Microbiological of water and soil. Study of microbial interaction in soil. Study of nitrogen fixing and symbiotic soil bacteria.

REFERENCE BOOKS

1. Dr.R.C.Dubey and Dr.D.K.Maheswari, 2014. A textbook of Microbiology, S.Chand and Co.
2. Frazier, W.C. 1978. Food Microbiology, McGrawHill.
3. Frobisher.M, 1974. Fundamentals of Microbiology, W.B.Saunders.
4. Pelczar and Reid, 1986. Microbiology. TataMcGraw Hill.
5. Powar&Daginawala, 2005. General Microbiology Vol I & II, Himalaya Publishing House.
6. Kalaichelvan.P.T, 2004. Microbiology and Biotechnology. MJP Publishers, Chennai.

JOURNALS

1. Journal of American Medical Association
2. International Journal of Microbiology Research

E – LEARNING RESOURCES

1. <https://www.>
2. <https://www.foodsciences.cals.edu>>
3. <https://www.addgene.org>>plasmid
4. <https://www.fungaldiversity.org>
5. <https://www.envirolitracy.org>

COURSE OUTCOMES

CO No.	CO STATEMENT
CO 1	Understand the working principle of instrumentation for visualizing microbes
CO 2	Identify the microbes using morphological criteria
CO 3	Understand the antibiotic resistant mechanisms operating in microbes
CO 4	Learn the basics of interaction between food and microbes
CO 5	Understand the importance of aerobiology

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	2	2	2
CO 2	3	3	2	2	2
CO 3	2	2	2	2	2
CO 4	2	3	3	3	3
CO 5	2	2	3	3	3
AVERAGE	2.4	2.4	2.4	2.4	2.4

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**M.Phil DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018**

PAPER –III APPLIED CYTOGENETICS

COURSE OBJECTIVES:

- ❖ To study sample preparation, staining, banding techniques
- ❖ To study karyotyping of chromosomes
- ❖ To enable students to understand gene transfer through chromosome manipulation.
- ❖ To study various techniques of molecular markers and their utilization
- ❖ To teach the techniques of detecting chromosomal cytotoxicity

COURSE OUTLINE

- Unit I** Plant sample Preparation – Processing and visualization of mitotic and meiotic samples
- Unit II** Staining and banding techniques of chromosomes – types and applications, Genetic and cytological mapping of chromosomes – flow karyotyping – chromosome sorting.
- Unit III** Alien gene transfer through chromosome manipulation – whole genome, individual chromosome, individual gene
- Unit IV** Molecular markers and their utility – AFLP, VNTR, SSR, FISH, CGH
- Unit V** Detection of cytotoxicity – Morphological, anatomical and chromosomal changes in plants.

REFERENCE BOOKS

1. Dryansankar 1992. Cytology & Genetics. V.R. Tata McGraw –Hill Publishing Company Ltd.
2. R.S.Shukla& P.S. Chandel, 2007. Cytogenetics, Evolution, Biostatistics and Plant Breeding. S. Chand &Co Ltd.
3. Prakash. S. Lohar. 2009. Cell and Molecular Biology. MJP Publisher.
4. Robert. F. Weaver, 2005. Molecular Biology. MC Graw Hill International Edition.
5. Cohn N.S 1979. Elements of Cytology, Freeman Book Co.
6. Hell. J.I.Flowers T.J and Roberts R.M 1978, Plant cell structure and metabolism Longman.
7. Verma P.S. and Agarwal V.K 1980. Cytology, S.Chand&Co Ltd.
8. S.P.Mishra 2011. Evolution, Ecology, Cell Biology & Genetics, Silverline Publications, New Delhi.

JOURNALS

1. Journal of Cytology
2. Journal of Genetics
3. Molecular Cytogenetics

E – LEARNING RESOURCES

1. <https://www.springer.com/gp/book/9781493931415>
2. <https://www.frontiersin.org/articles/260991>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5581911/>
4. <https://www.sciencedirect.com/topics/neuroscience/genetic-mapping>
5. <http://www.nature.com/scitable/topicpage/thomas-hunt-morgan-genetic-recombination-and-gene-496>
6. https://link.springer.com/chapter/10.1007/978-1-4614-8585-8_1
7. https://www.researchgate.net/publication/259826982_Alien_Gene_Transfer_in_Crop_Plants_Innovations_Methods_and_Risk_Assessment
8. <https://www.intechopen.com/books/plant-breeding-from-laboratories-to-fields/molecular-markers-and-marker-assisted-breeding-in-plants>
9. https://www.researchgate.net/publication/282954774_Molecular_markers_in_plants_Concepts_and_applications
10. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4272485/>
11. <https://www.intechopen.com/books/plant-ecology-traditional-approaches-to-recent-trends/detection-of-environmental-mutagens-through-plant-bioassays>

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
CO 1	The student will learn the sample preparation and banding techniques in living cells.
CO 2	The student will be able to learn the technique of karyotyping
CO 3	Students will be able to understand gene transfer through chromosome manipulation.
CO 4	Students will be able to master the various techniques of molecular markers and their utilization
CO 5	Students will learn the techniques of detecting chromosomal cytotoxicity

MAPPING COURSE OUTCOME WITH PRORAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	3	2	2	3
CO 2	3	3	2	2	3
CO 3	1	3	2	2	2
CO 4	2	2	2	2	3
CO 5	1	2	2	2	2
AVERAGE	2	2.6	2	2	2.6

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Phil DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
PAPER –III PHYTOCHEMISTRY OF MEDICINAL PLANTS

COURSE OBJECTIVES

- ❖ To learn the techniques of estimation of biomolecules
- ❖ To understand the types, characterization and applications of phytochemicals
- ❖ To learn the extraction methodologies of crude phyto drugs.
- ❖ To enable the differentiating criteria of adulterants of herbs and their products
- ❖ To learn the importance of medicinal plant conservation.

COURSE OUTLINE

- Unit-I** Extraction and estimation of Carbohydrates, Proteins and Lipids.
- Unit-II** Classification-Occurrence, therapeutic effects-Pharmaceutical applications of alkaloids, Terpenoids, glycosides, volatile oils, tannins and resins.
- Unit-III** Extraction of crude drugs from plant parts roots, stem, leaves, flowers, fruits and seeds- evaluation of crude drugs (Physical, Chemical and Biological).
- Unit-IV** Adulterants of herbs and herbal products-chromatographic techniques to separate alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.
- Unit-V** Trading, conservation and preservation -current scenario of medicinal plants

REFERENCES

1. Romesh Kumar Sud and Sudhir Kumar, 2004. Herbs : Culinary, Medicinal, Aromatic. Scientific Publishers, Jodhpur.
2. S.Singh and Subalakshmi 2013. Medicinal Plants. Kalpaz Publications. New Delhi.
3. C.K.Kokate, A.P.Purohit and S.B.Gokhale 2010. Pharmacognosy, Nirali Prakasan (Pub) Repro India Ltd. Mumbai.
4. John Jothi Prakash. E. 2003. Medicinal and Aromatic Plants. J.P.R. Publications, Tirunelveli.
5. Manisha Tiwari and Vibha Tandon 2004. Medicinal Plants. ISHA Books, New Delhi.
6. Murali S and A. Kumar Pathak 2007. Medicinal and Aromatic Plants, Aavishkar Publishers, Jaipur.

JOURNALS

1. Phytochemistry
2. Journal of Pharmacognosy and Phytochemistry
3. Journal of Biotechnology and Phytochemistry

E – LEARNING RESOURCES

1. https://www.krishisanskriti.org/vol_image/03Jul201505070419.pdf
2. <https://onlinelibrary.wiley.com/doi/pdf/10.1002/jsfa.2740091104>
3. https://shodhganga.inflibnet.ac.in/bitstream/10603/17430/10/11_appendices.pdf
4. <https://www.sciencedirect.com/science/article/pii/S187439001400113X>
5. <https://explorepharma.wordpress.com/2010/09/07/pharmaceutical-uses-of-terpenoids/>
6. <https://www.intechopen.com/books/secondary-metabolites-sources-and-applications>
7. http://agritech.tnau.ac.in/horticulture/extraction_techniques%20_medicinal_plants.pdf

8. http://www.phytojournal.com/vol2Issue5/Issue_jan_2014/11.pdf
9. <http://www.plantsjournal.com/archives/2017/vol5issue4/PartA/5-3-40-746.pdf>
10. <https://www.nmpb.nic.in/content/marketing-trade>
<https://www.journalcra.com/article/current-scenario-herbal-medicine-india>

COURSE OUTCOMES

CO NO.	CO STATEMENT
CO 1	Knowledge on quantitative characterization of biomolecules
CO 2	Learn the general and applied aspects of phytochemical compounds
CO 3	Extraction and evaluation of crude drugs from various parts of plants
CO 4	Learn the evaluation of phytochemical compounds using analytical chromatography
CO 5	Understand the methods of trading and conservation of medicinal plants.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	3	3	3	3
CO 2	3	3	2	3	3
CO 3	3	2	3	3	3
CO 4	3	3	3	3	3
CO 5	2	2	2	2	3
AVERAGE	2.8	2.4	2.6	2.8	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Phil DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
PAPER – III: PLANT ANATOMY AND MICROTECHNIQUE STUDIES

COURSE OBJECTIVES:

- ❖ To learn about the identification of plant tissue systems
- ❖ To differentiate the anatomy of root and shoot
- ❖ To learn the types and arrangements of vascular tissue systems
- ❖ To prepare permanent anatomical slides
- ❖ To understand the methodology of histochemical characterization

COURSE OUTLINE

- UNIT I:** Tissue system – Dermal tissue system – fundamental tissue system – vascular tissue system. Cambium – classification of cambium – fascicular cambium - structure and functions of cambium- cambium in wound healing – cambium in monocotyledons.
- UNIT II** Differences between dicotyledonous and monocotyledonous roots – secondary growth in dicotyledonous roots – differences between dicotyledonous and monocotyledonous stem – periderm – lenticels, rhytidome - polyderm, bark- annual rings, heartwood, sapwood.
- UNIT III** Vascular bundles-types. Anomalous secondary thickening – cortical, medullary bundles. Wood anatomy – types of wood – heart wood, sapwood, porous – ring porous wood, diffuse porous wood, texture – reaction wood – tension wood, compression wood.
- UNIT IV** Microtechnique – definition, microtome types – rotary microtome – working principle, fixation – fixatives – embedding, sectioning, staining – preparation of permanent and temporary slides. Special methods – maceration, clearing and whole mount.
- UNIT V** Applied anatomy- histochemical studies –Identification of cutin, suberin, lignin, phenols, tannins and lipids. Anatomy in relation to taxonomy – hairs, stomata, veins, petiole and medullary rays

REFERENCE BOOKS

- Pandey B.P 2010. Plant Anatomy, S.Chand & Co.
- Bhojwani S.S, and Bhatnagar S.P. 2011. The Embryology of Angiosperms. Vikas Publishing pvt. Ltd
- Narayanaswamy, S. 1984. Plant cell and tissue culture Tata McGraw Hill Pub., Co., Ltd.,New Delhi
- Culter E.G. 1978. Plant Anatomy – Experimental and interpretation Tata McGraw Hill Pub., Co., Ltd.,New Delhi.
- Fahn, a. 1989. Plant Anatomy, MacMilan Pub
- Manseth, T.D. 1988. Plant Anatomy. The Benjamin Cumings Pub. Co. Ltd.
- Erdtman, G. 1954. An introduction to pollen analysis. Chronica Botanica, Waltham, Mass USA.
- Johri, B.M. 1984. Embryology of Angiosperms, SpringerVerlag.
- Knox, R.B. 1980. Pollen and allergy, Arnold –Heinemann.
- Maheshwari, P. 1950. Embryology of Angiosperms, McGraw Hill Book Co. Inc. New York.
- Nair, P.K.K. 1985. Essentials of Palynology. Vikas Publishing pvt. Ltd
- Nair, P.K.K. 1974. Advances in pollen spore research. Vol.I Today and Tomorrow Printers and Pub. New Delhi.

- Berlyn, G.P and Miksche, J.P 1976. Botanical microtechnique and Cytochemistry. The IOWA State University Press, IOWA.
- Johansen, D. A. 1940. Plant Microtechnique, McGraw Hill Book Co. New York.
- Jensen, W.A. 1962. Botanical Histochemistry, W.H. Freeman and Co., San Francisco
- Sass, J. E. 1940. Elements of Botanical Microtechnique. Mc. Graw Hill Book Co. New York
- Willey, R. L., 1971. Microtechniques: A Laboratory Guide. The Macmillan Company, New York

JOURNALS

1. Plant anatomy
2. Journal of plant anatomy and morphology
3. Journal of Botany

E – LEARNING RESOURCES

1. <https://www.toppr.com/guides/biology/anatomy-of-flowering-plants/tissue-systems/>
2. <https://www2.estrellamountain.edu/faculty/farabee/biobk/BioBookPLANTANATII.html>
3. <https://www2.palomar.edu/users/warmstrong/trjune99.htm>
4. <https://www.britannica.com/science/vascular-bundle>
5. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/wood-anatomy>
6. <http://www.ca.uky.edu/agc/pubs/for/for59/for59.pdf>
7. <http://www.woodanatomy.ch/>
8. <https://paramedicsworld.com/histopathology-cytopathology-notes/microtomes/medical-paramedical-studynotes>
9. https://www.labce.com/spg605374_instrumentation_for_microtomy_rotary_microtome_par.aspx
10. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/suberin>
11. <https://www.sciencedirect.com/topics/neuroscience/suberin>

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
CO 1	Know the patterns of simple and complex tissues in plants
CO 2	Enable to differentiate between anatomy of dicot and monocot, in addition to the secondary anatomical characters
CO 3	Learn the different types of vascular tissues pertaining to primary and secondary growth
CO 4	Understand the basics of microtechniques and their applications
CO 5	Acquire thorough knowledge on qualitative histochemical analysis

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5

CO 1	3	2	1	2	2
CO 2	2	3	2	2	2
CO 3	2	2	2	2	2
CO 4	2	3	3	3	3
CO 5	2	3	3	3	3
AVERAGE	2.2	2.6	2.2	2.4	2.4

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY
CORRELATED-1 NO CORRELATION-0

M.Phil DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER 2
PROJECT

To plan and design, retrieve relevant literature, organize and conduct, process the data, photograph relevant observations and evaluate by statistical programs. The work has to be conducted in the department under the guidance of the project supervisor. Interdisciplinary collaborations from external departments or Institutions can be organized only for essential areas of the project.

QUAID-E-MILLATH GOVT. COLLEGE FOR WOMEN
(Autonomous)

Anna salai, Chennai - 600 002.

M.Sc PLANT BIOLOGY AND
PLANT BIOTECHNOLOGY

SYLLABUS



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

OFFERED FROM THE ACADEMIC YEAR 2017-2018

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**QUAID – E- MILLATH GOVERNMENT COLLEGE FOR WOMEN,
(AUTONOMOUS)
CHENNAI – 600 002**

Postgraduate Courses

Choice Based Credit System

Quaid – E- Millath Government college for Women (Autonomous) offers the semester System of Education with credits for PG courses. Credit simply means the weightage given to what is taught and what is learnt. It is normally related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design, Each course is designed variously under lectures/ tutorials/ laboratory work/ seminar/ project work/ Practical training/ viva voce etc. to facilitate effective teaching and learning and the credits are assigned according, depending on the content and the specialization.

The minimum credit requirement for a two – year PG course shall be 90.

RULES AND REGULATIONS:

1.Duration

a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semesters, the second academic year, the third and fourth semesters.

b. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year.

2. Course of Study

The course of study for Postgraduate Degree Courses shall comprise of core courses and electives.

3. System of Credits

year	No. of Papers			Marks	Credits				Total
	Core	Elective &E D Elective	Soft Skill		Core	Elective &E D Elective	Soft Skill	Internship	
I Year	7	3 + 1	2	1300	28	12	2 x 2 = 4	2	
II Year	8	2 + 1	2	1300	32	09	2 x 2 = 4		
Total	15	5 + 2	4	2600	60	21	8	2	91

4. Passing Minimum

A candidate shall be declared to have passed in each paper / practical of the Main Subject of

Study wherever prescribed if she secures **NOT LESS THAN 50%** of the marks prescribed for the examination. She shall be declared to have passed the whole examination, if she passes in all papers and practical wherever prescribed, as per the scheme of examinations, earning 90 credits.

5. Eligibility for the award of Degree

Candidates must secure a minimum of **50%** of marks in the Semester End Examinations. A candidate must secure 8 credits in soft skills and 2 credits in internship in addition to 90 credits from Core and Elective courses to obtain a Post Graduate Degree.

6. Ranking

Candidates who pass all the examinations prescribed for the course in the

FIRST APPEARANCE ALONE are eligible for classification / Ranking / Distinction.

M.Sc. DEGREE COURSE

PROGRAMME OUTCOME

On completion of the programme, the learner is able to:

1. Apply computational knowledge.
2. Identify quality Research.
3. Design own curriculum to face competitive world.
4. Acquire tremendous subject knowledge of the subject.
5. Demonstrate quality skills.

PROGRAMME SPECIFIC OUTCOMES

PSO1:

Outline the classification and detailed studies about algae, fungi, bryophytes, Pteridophytes, Gymnosperms and Angiosperms and link it with evolutionary trends.

PSO2:

Understand the pattern of tissue organization, reproductive methods, physiological functions, biochemical aspects, hereditary characters and statistical analysis.

PSO3:

Analyze and utilize the knowledge of microbes in the field of plant pathology, applying tissue culture techniques in horticulture to cope up with emerging advanced

fields like environmental biotechnology, recombinant DNA technology and microbiology.

PSO4:

Enable the taxonomical identification of plant species; locate phytogeographic regions using remote sensing.

PSO5:

Apply the knowledge for researches related to biochemical compounds, Molecular studies and cellular components and to prepare for competitive exams like UPSC, IFS, CSIR-NET, GATE, ARS etc

M. Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

CHOICE BASED CREDIT SYSTEM - SEMESTER WISE PAPER DETAILS

FROM 2017-2018 BATCH ONWARDS

Semester	Components	Subject Code	Title of paper	Lect. Hrs.	Inter marks	Sem. marks	Total marks	Credits
I	Core	176401	Phycology, Mycology & Bryophytes	6	25	75	100	4
I	Core	176402	Pteridophytes, Gymnosperms & Paleobotany	6	25	75	100	4
I	Core	176403	Practicals – I	8	25	75	100	4
I	Elective	176404	Plant Breeding, Commercial crops & their Improvement	5	25	75	100	3

I	Elective	176405	Entrepreneurial Botanical Applications	5	25	75	100	3
II	Core	176406	Plant Anatomy, Embryology and Palynology	5	25	75	100	4
II	Core	176407	Microbiology	5	25	75	100	4
II	Core	176408	Taxonomy of Angiosperms	5	25	75	100	4
II	Core	176409	Practicals – II	8	25	75	100	4
II	Elective	176410	Medicinal Botany & Phytochemistry	4	25	75	100	3
II	E D Elective	176411	Food Science & Nutrition	4	25	75	100	3
II		175001	Soft skill					2+2
III	Core	176412	Plant Physiology & Biochemistry	5	25	75	100	4
III	Core	176413	Cell Biology, Genetics & Biostatistics	5	25	75	100	4
III	Core	176414	Plant Pathology	5	25	75	100	4
III	Core	176415	Practicals – III	8	25	75	100	4
III	Elective	176416	Applied Plant Cell & Tissue Culture	4	25	75	100	3
III	E D Elective	176417	Principles of Horticulture	4	25	75	100	3
IV	Core	176418	Molecular biology, Biotechnology & Bioinformatics	6	25	75	100	4
IV	Core	176419	Environmental Botany, Phytogeography & Remote Sensing	6	25	75	100	4
IV	Core	176420	Practicals – IV	6	25	75	100	4
IV	Core	176421	Project Work	5	--	75 + 25	100	4
IV	Elective	176422	Bio-instrumentation , Bio-techniques & Computer Applications	5	25	75	100	3
IV			Soft skill					2+2

IV			Soft skill Internship					2
			Total	120				91

EVALUATION PATTERN FOR CA

Distribution of marks for Continuous Assessment:- Theory

Test		Total	Assignment/Seminar/ Creative Presentation/ Assignment on glossary			Model Exam	Attendance	Total	Reduced to
1	2	40	1	2	3	25	10	100	25
20	20		10	10	5				

Test (two) : 40 Marks

Assignment / Seminar/ Creative Presentation/

Assignment on glossary : 25 Marks

Model Examination : 25 Marks

Attendance ` : 10 Marks

Attendance percentage

90 & above : 10 Marks

80 & above : 9 Marks

75 & above : 8 Marks

65 & above : 7 Marks

55 & above : 6 Marks

End Semester Theory Examination: Question Paper Pattern:

Section A Short answers(answer ANY TEN questions) : 10 X 2 = 20 Marks

Section B Paragraph answers : 5 X 5 = 30 Marks (5 out of 8)

Section C Essay : 3 X 10 = 30 Marks (3 out of 5)

Total : 75 Marks

Distribution of CIA marks – Practical

Submission of observation : 30 Marks

Tests on Spotters : 20 Marks

Practical Model Exams : 50 Marks

Total : 100 Marks

Reduced to : 25 Marks

End Semester Practical Examination: Question Paper Pattern:

Practical Maximum marks : 75

(Given in the Syllabus)

Part IV

Semester End Examination : 60 Marks

Continuous Internal Assessment : 40 Marks

Distribution of CIA Marks:

Seminar/Presentation	Assignment / Term	Written/ Oral	Total

	Paper	Test	
20	10	10	40

Semester End Exam: Theory Paper : 60 Marks - Duration : 2.30 hours

Question paper pattern: 10x6 Marks = 60 Marks (10 out of 15)

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2017-2018

SEMESTER 1

PAPER 1

PHYCOLOGY, MYCOLOGY AND BRYOPHYTES

Lecture Hrs:6 Hrs

Credit :4

THEORY

COURSE OBJECTIVES

- To teach general characters of lower plants
- To understand the life history of cryptogams
- Study the evolutionary trends in cryptogams.
- To know the economic importance of algae, fungi and bryophytes
- To provide knowledge on fossil forms of various cryptogams

COURSE OUTLINE

UNIT 1: Classification of algae (Silva, 1982). General account - Thallus organization and Pigmentation. Life cycle types in algae, Economic importance of algae. Fossil algae, Phylogeny of Algae.

UNIT 2: Structure, reproduction and Life cycle of the following genera: *Oscillatoria*, *Caulerpa*, *Padina* and *Gelidium*

UNIT 3: Classification of fungi (Alexopoulos and Mims, 1979). General account - Heterothallism in fungi – sexuality in fungi, parasexuality - Mycorrhizal fungi and its application in agriculture and forestry. Fossil fungi, Phylogeny of Fungi. Economic importance of fungi.

UNIT 4: Structure, reproduction and life cycle of the following genera:
Mucor, *Taphrina*, *Peziza*, *Polyporus*, *Puccinia*, and *Alternaria*.

UNIT 5: Classification of Bryophytes (Watson, 1955) – General characters of Bryophytes – Range in structure and evolution of gametophytes and sporophytes. Fossil bryophytes.

Structure, reproduction and life cycle of the following genera:
Lunularia, *Reboulia*, *Anthoceros* and *Polytrichum*.

Practicals

- Study of algal genera included in the theory
- Study of morphological and reproductive structures of the fungal genera mentioned in the theory.
- Study of morphological, anatomical and reproductive structures of the genera of Bryophytes mentioned in the theory.

RECOMMENDED TEXTBOOKS

- Alexopoulos, C.J., C.W. Mims and M.Blackwell 2013. Introductory Mycology, Wileys, New Delhi.
- Bold, H.C. and Wynne, M.J. 1978. Introduction of the Algae. Prentice Hall, New Delhi.
- Burnett, J.M. 1976. Fundamentals of Mycology. Arnold. London.
- Cavers, I. 1990. Inter relationships of the Bryophyta.
- Chapman, V.J. and Chapman D.J. 1980. Seaweeds and their uses. Chapman and Hall London.

REFERENCE BOOKS

- Chopra, R.N. & Kumar, P.K. 1988. Biology of Bryophyta. Wiley Eastern Ltd.
- Clarke, G.C.S. & Duckett, J. 1979. Bryophytes Systematics.
- Cresswell, R.C., Reiss T.A.V. and Shaw, N 1989. Algal and Cyanobacterial Biotechnology. Longman, London.
- Fritsch, F.E 1935, 1945. The Structure and reproduction of Algae, Vol I and Vol II.
- B.R.Vashista, A.K.Sinha, V.P.Singh 2012. Botany for Degree Students Algae, S.Chand& Company Ltd., New Delhi.
- B.R.Vashista, A.K.Sinha and Adarsh Kumar 2012. Botany for Degree Students Bryopyta, S.Chand & Company Ltd., New Delhi.
- Iyengar, M.O.P. and Desikachary T.V. 1981. Rhodophyta. ICAR. New Delhi.
- Kumar, H.D. and Singh, H.N 1982. A Text Book of Algae. East West Publication, New Delhi.
- Kumar, H.D. 1990. Introductory Phycology. East West Publication New Delhi.
- Round, F.F 1981. The Ecology of Algae, CUP, Cambridge.
- Sharma, P.D 1989. The Fungi, Rastogi Publication, Merrut.
- Sharma, O.P 2008. Text Book of Algae. Tata McGraw Hill.
- South, R and Whittick, A 1987. Introduction to Phycology, Blackwell Scientific Publication
- Waston, E.V. 1971. The Structure and life of Bryopytes Hutchinson, Publication, London.
- S.N.Pandy and P.S.Trivedi 2009. A Text book of botany Vol-I, Vikas Publishing House Pvt. Ltd.

JOURNALS

1. International Journal of Phycology
2. Italian Journal of Mycology
3. Indian journal of Hydrobiology

4. The Bryologist
5. Algal Research – Biomass, Biofuel and Bioproducts– Elsevier

E-LEARNING RESOURCES

1. <http://chapmanlab.lsu.edu/> -- algae gallery at chapman lab
2. <http://www.richard-seaman.com/Fungus/links.html>
- 3.
4. <https://biologyreader.com/mucor.html>
5. . <http://www.bryophytes.plant.siu.edu/>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Identify and give description about the various forms studied
CO2	Classify the algae, fungi and bryophytes based on its characters
CO3	Understand the role of various cryptogams in the environment
CO4	Discuss the fossil form of algae, fungi and bryophytes and evolution pattern
CO5	Apply the role of mycorrhiza in the field of agriculture

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3
CO2	3	3	2	2	3
CO3	2	3	3	2	3
CO4	3	3	3	2	3
CO5	2	2	2	2	3
AVERAGE	2.6	2.8	2.4	2	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER 1
PAPER 2

PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY

Lecture Hrs:6 Hrs

Credit :4

THEORY

COURSE OBJECTIVES

- To learn the classification and general characters of pteridophytes
- To know the life history and economic importance of pteridophytes
- To study the classification, salient features and phylogeny of gymnosperms
- Studies on living forms of gymnosperms
- To gain knowledge about the methods of fossilization and types of fossil organ genera

COURSE OUTLINE

UNIT 1: Classification of Pteridophytes (Reimer 1954). General characteristics - Soral evolution. Heterospory and seed habit. Economic importance of Pteridophytes. Phylogeny of Pteridophytes.

UNIT 2: Structure, reproduction and life cycle of the following genera: *Selaginella*, *Isoetes*, *Osmunda*, *Polypodium* and *Marsilea*

UNIT 3: Classification of Gymnosperms (K.R. Sporne. 1965) General characteristics. Economic importance of Gymnosperms. Phylogeny of Gymnosperms.

UNIT 4: Structure, reproduction and life cycle of the following genera: *Cupressus*, *Araucaria*, *Podocarpus* and *Ephedra*

UNIT 5: Types of fossils and fossilization. Dating techniques. Fossil fuel - conservation of fossil fuel, Contributions of Birbal Sahni.

Study of organ genera:

Sphenophyllum, *Calamites*, *Medullosa*, *Lyginopteris*, *Pentoxylon*

Practical

11. Study of the external morphology and internal anatomy of the vegetative and reproductive organs of the Pteridophyte genera given in the theory.
12. Study of the external morphology and internal anatomy of the vegetative and reproductive organs of the Gymnosperm genera given in the theory.
13. Study of the genera under Paleobotany given in the theory syllabus.

RECOMMENDED TEXTBOOKS

- Vashista.P.C, A.K Sinha and Anil kumar 2012. Botany for Degree Students Pteridophytes, S.. Chand and Co., New Delhi.
- Vashista.P.C, A.K Sinha and Anil kumar 2013. Botany for Degree Students Gymnosperms, S.. Chand and Co., New Delhi.
- Shukla A and Mishra S.P. 1982, Essentials of Paleobotany, Vikas Publishing, House Pvt. Ltd.

REFERENCE BOOKS

- Parihar, N.S. 1980. The Biology and Morphology of Pteridophytes, Central Book Dept., Allahabad. Rashid, A. 1979. An introduction to Pteridophytes, Vikas Publication.
- Sporne, K.R. 1965. The morphology of Pteridophytes. Hutchinson Publication, London.
- Sporne, K.R. 1965. The morphology of Gymnosperms Hutchinson Publication, London.
- S.N.Pandey, S.P.Misra and P.S.Trivedi 2011. A Text book of botany Vol- II, Vikas Publishing House Pvt. Ltd.
- R.P.Singh 2011. Hand Book of Botany, Silverline publications, Varanasi.
- K.A.Siddiqui 2003. Elements of Paleobotany, Kitab Mahal, Allahabad.
- A.V.S.S.Sambamurthy 1998. A Text book of Botany Vol-II, Konark Publishers Pvt. Ltd.
- Chester R Arnold, 1977. An introduction to Paleobotany, Tata McGraw – Hill Publishing Company Ltd, New Delhi.
- A. C. Seward, 1991. Fossil Plants Vol-III & IV, Today & tomorrow's Printers & Publishers, New Delhi.
- V.Singh, P.C. Pande, D. K. Jain, 2014. Diversity and Systematics of seed plants, Rastogi publications, Meerut.

JOURNALS

1. International Journal of Current Research and Academic Review
2. International Journal of Plant Sciences
3. Paleobotany

E-LEARNING RESOURCES

1. <http://en.wikipedia.org/wiki/Pteridophyte>

2. <https://www.easybiologyclass.com>
3. <http://en.wikipedia.org/wiki/Pteridophyte>
4. www.mineralogie.uni-wuerzburg.de/palbot1.html
5. www.colby.edu/~ragastal/Paleobot.htm---- (introduction to paleobotany)
6. www.ucmp.berkeley.edu/IB181/VPL/Dir.html -- (virtual paleobotany lab)
7. <http://en.wikipedia.org/wiki/Gymnosperm>
8. <http://www.gymnosperms.org/>
9. <http://www.hcs.osu.edu/hcs300/gymno.htm>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Understand the different pteridophyte and gymnosperm genera
CO2	Demonstrate spore types, heterospory and seed habit
CO3	Use the economically important pteridophytes
CO4	Use the economically important gymnosperms
CO5	Find the age of fossil genera by observing the type of fossil

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	3
CO2	3	3	2	2	3
CO3	3	2	3	2	3
CO4	3	2	3	2	3
CO5	3	2	2	2	3
AVERAGE	3	2.4	2.4	2	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2017-2018

SEMESTER 1

PAPER 3 – PRACTICAL - I

**PHYCOLOGY, MYCOLOGY, BRYOPHYTES, PTERIDOPHYTES,
GYMNOSPERMS AND PALEOBOTANY**

Practical Hrs:8 Hrs
Credit :4

Time: 4 hours
: 75

Subject code:
10

Max Marks

Record :

1. Make suitable stained temporary slide preparations of A and B. Draw labeled diagrams. Identify giving reasons. Submit the slides for valuation. (2x5=10 marks)
2. Cut transverse sections of C and D. Draw labeled diagrams. Identify giving reasons. Submit the slides for valuation
(2x5=10marks)
3. Make suitable micro preparation of E. Identify giving reasons. Submit the slide for valuation
(1x5=5 marks)
4. Identify and comment on F and G. Mention the geological era.
(2x5=10 marks)
5. Identify and comment on H, I, J, K and L
(5x3=15 marks)
6. Spot at sight. Give the group, generic name and morphology of the given material of M, N, O, P and Q.
(5x3=15 marks)

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2017-2018

SEMESTER 1

PAPER 3 – PRACTICAL - I

**PHYCOLOGY, MYCOLOGY, BRYOPHYTES, PTERIDOPHYTES,
GYMNOSPERMS AND PALEOBOTANY**

KEYS

1. Slide – 2 Marks; Identification – 1 Mark; Diagram – 1 Mark; Reasons – 1 Mark

A Algae

B Fungi (2x5=10 marks)

2. Slide – 2 Marks; Identification – 1 Mark; Diagram –1 Mark; Reasons – 1 Mark

C Bryophyte

D Pteridophyte (2x5=10 marks)

3. 1. Slide – 2 Marks; Identification – 1 Mark; Diagram –1Mark; Reasons – 1 Mark

E Gymnosperm (1x5=5 marks)

4. Identification – 1 Mark; Diagram –1 Mark; Reasons – 1 Mark;

Geological Era – 1 Mark (2x5=10 marks)

F Fossil Pteridophyte

G Fossil Gymnosperm

5. Identification – 1 Mark; Diagram – 1 Mark; Reasons – 1 Mark

H Algae

I Fungi

J Bryophyte

K	Pteridophyte	
L	Gymnosperm	(5x3=15 marks)

6. Group – 1 Mark; Generic name – 1 Mark; Morphology – 1 Mark

M	Algae	
N	Fungi	
O	Bryophyte	(5x3=15 marks)
P	Pteridophyte	
Q	Gymnosperm	

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2017-2018

SEMESTER 1

PAPER 3 – PRACTICAL - I

PHYCOLOGY, MYCOLOGY, BRYOPHYTES, PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY

Practical Hrs:8 Hrs

Credit :4

COURSE OBJECTIVES

- To identify microscopically and to study the characters of algae, fungi, bryophytes, pteridophytes, gymnosperms and fossil forms
- To make micropreparation of algae, fungi, bryophytes, pteridophytes and gymnosperms
- To explain the genera based on classification

Keys

4. **Algae :** Micropreparation - *Caulerpa*, *Padina* and *Gelidium*
5. **Fungi:** Micropreparation- *Mucor*, *Taphrina*, *Peziza*, *Polyporus*, *Puccinia* and *Alternaria* infected leaf.
- **Bryophytes**
Transverse section- *Polytrichum* capsule, *Reboulia* thallus and *Anthoceros* thallus
- **Pteridophytes**
T.S –*Selaginella* stem, *Polypodium* rachis, *Isoetes* leaf, *Marsilea* - rhizome, petiole.
1. **Gymnosperm**
Micropreparation - *Cupressus*, *Araucaria* stem, *Podocarpus* –leaf and stem, *Ephedra* - stem
- **Fossil Pteridophytes(Photographs/slides/diagram /fossil impressions)**
Sphenophyllum – stem and strobilus, *Calamites* – stem, *Medullosa*- stem
- **Fossil Gymnosperm**
(Photographs/slides/diagram /fossil impressions)

Lyginopteris - stem , *Pentoxylon* - stem

(H – M PHOTOGRAPHS/HABIT/ SLIDES/DIAGRAM /FOSSIL IMPRESSIONS)

- **Algae:** *Oscillatoria*, *Caulerpa*, *Padina* and *Gelidium*
- **Fungi:** *Peziza*, *Polyporus*, *Puccinia*, and *Alternaria*- asexual stages
- **Bryophyte:** *Lunularia*, *Reboulia*, *Anthoceros* (including sex organs) and *Polytrichum* thallus entire and T.S , sporophyte V.S
- **Pteridophyte:** *Selaginella* – entire, strobilus, stem T.S, Rhizophore T.S, *Isoetes*- entire, sporocarp, rhizome T S; *Polypodium* - root, rhizome and rachis, *Marsilea* - rhizome, petiole
- **Gymnosperm:** *Araucaria*- stem T.S; *Podocarpus*- stem and leaf T S; *Ephedra*- stem and leaf T.S

(M-Q IDENTIFICATION OF GROUP , GENUS AND MORPHOLOGY)

- **Algae:** *Oscillatoria*, *Caulerpa* , *Padina* and *Gelidium*
- **Fungi:** *Peziza*, *Taphrina*, *Polyporus*, *Puccinia* and *Alternaria*
- **Bryophyte:** *Lunularia*, *Reboulia*, *Anthoceros* , *Polytrichum*
- **Pteridophyte:** *Selaginella*, *Isoetes* , *Polypodium* and *Marsilea*
- **Gymnosperm:** *Cupressus*, *Araucaria*, *Ephedra* and *Podocarpus*

RECOMMENDED TEXTBOOKS

1. A Text book of botany – Volume 1, S.N.Pandey, P.S.Trivedi
2. A Text book of botany – Volume 2, S.N.Pandey, P.S.Trivedi

REFERENCE BOOKS

1. Modern Practical botany, Vol-1, 2014, B.P.Pandey, S.. Chand and Co., New Delhi.

JOURNALS

1. Journal of botanical sciences
2. International Journal of Botany

E-LEARNING RESOURCES

1. <https://www.microscopemaster.com/microscope-slides.html>
2. <http://www.biologydiscussion.com/botany/practicals-botany/permanent-slide-preparations-3-methods/54089>
3. <https://bitesizebio.com/13398/how-histology-slides-are-prepared/>
4. https://biomedizin.unibas.ch/fileadmin/user_upload/biomedizin/core_facilities/histology/Guides/Paraffin_methods.pdf
5. <https://www.sciencedirect.com/topics/neuroscience/microtome>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Identification and classification the different forms
CO2	Make sections and neatly display in microscopic slides showing minute details
CO3	Explain the fossil organ genera and its characters
CO4	Investigate and differentiate the morphological and reproductive forms of algae , fungi , bryophytes,pteridophytes and gymnosperms
CO5	Discuss economic the important forms in algae , fungi, bryophytes ,pteridophytes and gymnosperms

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2017-2018

SEMESTER 1 - PAPER 4

MAJOR ELECTIVE 1

PLANT BREEDING, COMMERCIAL CROPS AND THEIR IMPROVEMENT

Lecture Hrs:5 Hrs

Credit :3

THEORY

COURSE OBJECTIVES

- To make aware of the concepts in methods of plant breeding
- To develop knowledge on the genetic improvement of self and cross pollinated plants
- To understand the importance of plant and plant products
- To apply the process of cultivation to groups of food crops
- To recognize the terms of intellectual property rights and patenting

COURSE OUTLINE

UNIT 1: Methods of plant breeding – self – fertilized, cross – fertilized and vegetatively propagated plants. Breeding plants for improving yield and quality and resistant to diseases and pests – role of hybridization, polyploidy and induced mutation in crop improvement.

UNIT2: Types of plant products and its importance. Intellectual property rights, Patenting. Study of taxonomical characters, cultivation practices of the following:

Cereals – Paddy; Millets - Ragi

Pulses – Soybean, Red gram

UNIT 3: Sugar – Sugarcane, palm sugar

Fibres – Cotton, Jute

Beverage- Coffee, Tea

UNIT 4: Fruit – Banana, Mango

Spices - Pepper, Vanilla

Volatile oil – Eucalyptus, Clove

UNIT 5: Drugs – Andrographis, Gymnema

Oil seed - Sunflower, Ground nut

Resins and Gums – Asofoetida, Gum Arabic

RECOMMENDED TEXTBOOKS

- Pandey, H.P. 2011 Economic Botany, Silverline Publications, New Delhi.
- Ramawat, K.G. 2000 Plant Biotechnology, S.Chand & co.
- Sambamurthy, S. and N.S. Subramanyam 1989 A text book of Economic Botany, Wiley
- Sen.S.1992 Economic Botany. New central Agency.

REFERENCE BOOKS

- Albert, F. Hill 1983 Economic Botany Tata McGraw Hill Pub.
- Ashok Bendre, Ashok Kumar. 1980: Economic Botany Tata McGraw Hill Pub.
- Chaudhary, R.C. 1999 Introduction to plant Breeding, Oxford & IBH.
- Dr. Ignacimuthu, S. Applied Plant Biotechnology. Tata McGraw Hill Pub. Company Ltd..
- Kochhar, S.L. 1981 Economic Botany in the Tropics, Macmillan.
- Pandey, B.P. 1988 Economic Botany S. Chand and Company.
- Verma, V. 1982 Text book of Economic Botany, Emkay Pub.
- V. Singh, P.C. Pande, D. K. Jain, 2012. Economic Botany, Rastogi Pub. Meerut.

JOURNALS

1. International Journal of Plant Breeding and Crop Science
2. Journal of Plant Genetics and Breeding

E-LEARNING RESOURCES

1. <https://en.m.wikipedia/.org>wikis>
2. <https://www.nature.com>
3. <https://www.britannica.com>
4. <http://www.theplantlist.org>
5. <http://www.botany.si.edu/ing>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Understand the methods of plant breeding and role of hybridization
CO2	Discuss the taxonomical characters and cultivation process of different plant groups
CO3	Discuss the importance of plant products and patenting
CO4	Explain the cultivation processes of plantation crops
CO5	Enumerate the cultivation process of crops with economic importance

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	2	3
CO2	2	2	3	2	3
CO3	2	2	3	2	3
CO4	2	2	3	2	3
CO5	2	2	3	2	3
AVERAGE	2	2	3	2	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER 1 – Paper 5
MAJOR ELECTIVE - 2

ENTREPRENEURIAL BOTANICAL APPLICATIONS

Lecture Hrs:5 Hrs

Credit :3

THEORY

COURSE OBJECTIVES

- To understand the cultivation of *Azolla*
- To apply the knowledge of LSF extraction
- To know the need of food preservation and its techniques
- To gain knowledge about the cultivation of edible mushroom varieties
- To know about some important medicinal plants and its products

COURSE OUTLINE

- UNIT 1:** Small scale and large scale cultivation of *Azolla*. Sea weed cultivation
Extraction of liquid seaweed fertilizer (LSF) and its applications.
Vermicompost.
- UNIT 2:** Types of preservation of Fruits and Vegetables – Physical (drying, freezing, heat), Chemical (sugar, salt, chemicals). Preparation of Jam, Jelly, Squash and Syrup- Pickles.
- UNIT 3:** Edible mushroom cultivation -Cultivation of paddy straw mushroom and white button mushroom, Nutritional value and uses.

UNIT 4: Single Cell protein (SCP) – Micro-organisms used [Yeast and *Spirulina*] - Production and Nutritive value, Marketing.

UNIT 5: Medicinal plants and their uses, Natural oils and their purification, Natural colours, Cosmoceuticals, Medicinal plant food and their food values, Medicinal values of the following products: Aloe vera gel, vallarai tablet, Hibiscus oil, Karpooradhi thailam, Thena mara kudi oil, Vadanarayana thailam, Pinda thailam.

RECOMMENDED TEXTBOOKS

- Nadkarni, K.M. 2010. Indian Materia Medica, Popular Prakasan, Bombay.
- S. Biswas, M. Datta and S. V. Nigacham, 2012. Mushroom, A Manual for Cultivation, PHI Learning Pvt. Ltd., New Delhi.
- C. Alagesa Boopathi 2013. Endemic Medicinal Plants, MJP Publishers, Triplicane, Chennai.
- P. T. Kalaichelvan 2008. Microbiology & Biotechnology, MJP Publishers, Triplicane, Chennai.
- V. Kumaresan 2010. Horticulture, Saras Publications.
- N. Kumar, 2010. Introduction to Horticulture, OPx ford & IBH Publishing Co. Pvt. Ltd, New Delhi.

REFERENCE BOOKS

- Jules Janick. 1982. Horticultural Science, Surjeet Publications.
- Franzier and Westhoff 1995. Food microbiology, Tata McGraw Hill Publishing Co.
- Chapman, V.J. and Chapman D.J. 1980. Seaweeds and their uses. Chapman and Hall London.
- Kumar, H.D. and Singh, H.N 1982. A Text Book of Algae. East West Publication, New Delhi.
- V.L. Sheela 2011. Horticulture, MJP Publishers.
- Sharma, O.P 2008. Text Book of Algae. Tata McGraw Hill Publishing Company Ltd.
- David Pierson, 1995. The Chemical analysis of foods, Churchill Livingstone, Edinburg, London.
- Brig. Harmander Singh (Rtd.) 1991 Mushroom - The Art of Cultivation Sterling Publishers.
- Alexopoulos, C.J., C.W. Mims and M. Blackwell 2013. Introductory Mycology, Wileys, New Delhi.

JOURNALS

1. International Journal of Entrepreneurial Peer Reviewed
2. Journal of Botanical Sciences

E-LEARNING RESOURCES

1. <https://www.agricultureguruji.com>
2. <http://www.theplantlist.org>
3. <http://www.botany.si.edu/ing>
4. <https://www.nutritionvalue.org>
5. <http://www.ipni.org>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	List the traditional medicinal plants with its importance
CO2	Analyse small scale and large scale cultivation of azolla
CO3	Explain the production , marketing and nutritive value of SCP and microorganisms
CO4	predict favourable conditions for the growth of edible mushrooms
CO5	Apply preservative techniques in day- to- day life

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	2	3
CO2	2	2	3	2	3
CO3	2	2	3	2	3
CO4	2	2	3	2	3
CO5	2	2	3	2	3
AVERAGE	2	2	3	2	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS 2017-2018

SEMESTER 2

PAPER - 6

PLANT ANATOMY, EMBRYOLOGY AND PALYNOLOGY

Lecture Hrs:5 Hrs

Credit :4

THEORY

COURSE OBJECTIVES

- To know about the internal structure and reproduction of the most evolved group of plants, the Angiosperms
- To understand the shoot structure and functional development aspects of various tissue

Systems in plants

- To know the heart wood and sap wood formation
- To learn the structure and development of microsporangium, megasporangium and endosperm
- To understand the basic concepts of palynology

COURSE OUTLINE

- UNIT 1:** Plant cell – cell wall ultrastructure; Organization and theories regarding shoot and root apex - Apical cell theory. Tunica Corpus, Histogen theory, Quiescent centre. Vascular cambium – origin, development and types, cambial activity – normal and anomalous, (*Bignonia*, *Boerhaavia*, *Nyctanthes*, *Leptadenia* and *Tinospora* aerial root). Cork cambium, Periderm, Polyderm, Rhytidome, Lenticels, anomalous secondary thickening in monocotyledons – (*Dracaena* stem).
- UNIT 2:** Xylem – differentiation, xylary elements, maceration techniques – tracheids, vessels, fibre and parenchyma. Patterns of secondary wall thickenings- tyloses, Reaction wood: Heart wood and sapwood, growth rings. Phloem – primary – secondary- sieve elements. Nodal Anatomy.
- UNIT 3:** Microsporangium – structure and development – Microsporogenesis - Megasporangium – structure and development – Megasporesis – Types of embryo sac – Double Fertilization.
- UNIT 4:** Endosperm- types, endosperm haustoria. Embryogeny (*Capsella* - *Nagella*) – Apomixis and polyembryony.
- UNIT 5:** Palynology, NPC formula. Recent advances in palynological studies – Aeropalynology - pollen allergy, Melitopalynology, Forensic palynology - Paleopalynology - Pollen fertility and sterility. - Palynological calendar.

Practical:

Anatomy

Laboratory work on the basis of topics listed under angiosperm anatomy theory, micrometry in anatomical studies, ocular and stage.

Techniques in making temporary and permanent – microscopic preparations, free hand, peelings, clearings.

Submission of 5 slides.

Free hand (2), Peeling (1), Maceration (1), Clearing (1).

Embryology

Preparation of whole mounts of embryo, acetolysis test for pollen, study from permanent preparation. Development and structure of anther, pollen, ovule, embryo sac, endosperm and embryo.

RECOMMENDED TEXTBOOKS

- Verma P.S and Agarwal V.K 1980, Cytology, S.Chand & Co Limited.
- Pandey B.P 2010. Plant Anatomy, S.Chand & Co.
- Narayanaswamy, S. 1984. Plant cell and tissue culture Tata McGraw Hill Pub., Co., Ltd., New Delhi.
- S.R. Misra. 2010. Text Book on Palaeobotany, Discovery publishing Pvt. Ltd.
- Arnold C.A. 1947. Introduction to Paleobotany, McGraw Hill.

REFERENCE BOOKS

- Bhojwani S.S, and Bhatnagar S.P. 2011. The Embryology of Angiosperms. Vikas Publishing pvt. Ltd
- Culter E.G. 1978. Plant Anatomy – Experimental and interpretation Tata McGraw Hill Pub., Co., Ltd., New Delhi.
- Fahn, a. 1989. Plant Anatomy, MacMilan Pub
- Manseth, T.D. 1988. Plant Anatomy. The Benjamin Cumings Pub. Co. Ltd.
- Erdtman, G. 1954. An introduction to pollen analysis. Chronica Botanica, Waltham, Mass USA.
- Johri, B.M. 1984. Embryology of Angiosperms, Springer Verlag.
- Knox, R.B. 1980. Pollen and allergy, Arnold –Heinemann.
- Maheshwari, P. 1950. Embryology of Angiosperms, McGraw Hill Book Co. Inc. New York.
- Nair, P.K.K. 1985. Essentials of Palynology. Vikas Publishing pvt. Ltd
- Nair, P.K.K. 1974. Advances in pollen spore research. Vol.I Today and Tomorrow Printers and Pub. New Delhi.
- K.A.Siddiqui 2003. Elements of Paleobotany, Kitab Mahal, Allahabad
- Peter George, 2008. Introduction to Paleobotany, Rajat Publications.

JOURNALS

1. Journal of Plant Anatomy and Morphology
2. International Journal of Embryology

E-LEARNING RESOURCES

1. www.biologydiscussion.com
2. www.saraspublication.com
3. <https://www.genetics.org>
4. www.quora.com
5. www.mineralogie.uni-wuerzburg.de/palbot1.html
6. www.colby.edu/~ragastal/Paleobot.htm---- (introduction to paleobotany)

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Identify the different types of plant tissues
CO2	Determine the age of trees based on counting the annual rings
CO3	Differentiate the normal and anomalous cambial activity
CO4	Explain the development of embryological process in different plant groups
CO5	Apply the knowledge of palynology in advance research fields

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3
CO2	3	3	2	2	3
CO3	2	3	3	3	3
CO4	3	3	3	3	3
CO5	3	2	2	3	3
AVERAGE	2.8	2.8	2.4	2.6	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER 2
PAPER 7
MICROBIOLOGY

Lecture Hrs:5 Hrs

Credit :4

THEORY

COURSE OBJECTIVES

- To understand the diversity of microbes
- To know the general characters of bacteria
- To learn about the potentialities of microbes in human welfare
- To understand the role of microbes in ecological balancing of nature
- To acquire knowledge of microbes in industrial and agricultural fields

COURSE OUTLINE

- UNIT 1 :** Scope, Whittaker's five kingdom classification. Classification of bacteria (Bergey's manual of determinative bacteriology - outline only). General characters, study of fine structure and composition of bacteria. Reproduction, Genetic recombination - transformation, transduction conjugation and sexduction.
- UNIT 2:** Mycoplasma – structure and classification; Viruses-Classification, general characters of plant viruses, Transmission, Bacteriophages, cyanophages and mycophages. Reproduction in T Phage. Structure and importance of prions and viroids.

- UNIT 3:** Food Microbiology: Contamination of food, Microbial spoilage, preservation and Microbiological examination of food. Fermented foods (Cheese, Yoghurt). Food poisoning - Botulism and Salmonellosis.
- UNIT 4:** Industrial microbiology: Types of fermentation processes, Baker's yeast, food and fodder yeast, production of vinegar, Citric acid; Industrial production of therapeutic compounds -production of penicillin, Retting of fibers. Types of microorganisms in milk, pasteurization of milk, MBRT, manufactured dairy products.
- UNIT 5:** Agricultural microbiology: Micro organisms in soil, role of microbes in soil biogeochemical cycles- carbon, nitrogen and sulphur; Biofertilizers, preparation, application and their significance, Bio-remediation. Bio-degradation of wastes, disposal of soil waste, treatment of liquid waste, Biomedical wastes and public safety. Microbes as biocontrol agents.

Practical:

Examinations of microorganism from milk and natural fermented food (idly, dough or curd) and water. Microscopic observations of root nodule bacteria. Gram Staining. Isolation of microbes from soil

RECOMMENDED TEXTBOOKS

- Boyd, R.G. 1988. Fundamentals of Microbiology, Times Mirror/Mosby College Publishers.
- Frazier, W.C. 1978. Food Microbiology. McGraw Hill

REFERENCE BOOKS

- Frobisher, M. 1974. Fundamentals of Microbiology. W.B. Saunders.
- Pelczar and Reid. 1986. Microbiology. Tata McGraw Hill
- Purohit, S.Sl 1991. Microbiology. Agro Botanical Publishers (India)
- Kalaichelvan, P.T 2004 Microbiology and Biotechnology. MJP Publishers
- Powar & Dagainawala, 2005 General Microbiology Vol. I & II , Himalaya Publishing House.
- Larry L. Barton, Diana E Northup. 2011. Microbial Ecology. Wiley Blackwell.
- L.E. Casida JR. 2009. Industrial Microbiology New Image International (p) Ltd.
- Dr.P.K.Sivakumar, Dr.M.M.Joe and Dr.K.Sukesh .2010. An Introduction to Industrial Microbiology S.Chand and Co. New Delhi.
- Dr.R.C.Dubey and Dr.D.K. Maheswari 2014. A text book of Microbiology, S.Chand and Co

JOURNALS

3. Journal of Applied Microbiology

4. International Journal of Microbiology Research

E-LEARNING RESOURCES

1. <https://courses.lumenlearning.com>
2. <https://www.foodsciences.cals.edu>
3. <https://www.doccity.com/en/economic>
4. <http://microbiologysociety.org>
5. <http://microbiologysociety.org>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Identify and compare the structure and function of microbes
CO2	Check microbial contamination in food samples
CO3	Introduce the beneficial microbes in agricultural and industrial biotechnology.
CO4	Explain the microbes involved in bioremediation process
CO5	Recognise the types of microorganisms and method of pasteurization of milk

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	2	3	3	3	3
CO4	3	3	3	2	3
CO5	3	2	3	2	3
AVERAGE	2.8	2.8	2.8	2.6	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2017-2018

SEMESTER - 2

PAPER 8

TAXONOMY OF ANGIOSPERMS

Lecture Hrs:5 Hrs

Credit :4

THEORY

COURSE OBJECTIVES

- To learn taxonomy of plants, the systematic classification
- Modern approaches and their importance in conservation biology
- To acquire the knowledge of ICBN and BSI
- To study the floristic characters of plants with their plant families.
- To impart knowledge about the economic importance of higher plants under the taxonomic hierarchy.

COURSE OUTLINE

UNIT 1: Taxonomy and systematics, Hierarchy, concepts of characters, qualitative, quantitative, analytical and synthetic. A brief history of classification- APG III System, Bentham & Hooker, Engler and Prantel

UNIT 2: Modern trends in Taxonomy – numerical taxonomy, molecular taxonomy, Chemotaxonomy. Botanical Survey of India – its organization and role. Role of herbarium, monographs and flora

UNIT 3: ICBN – its importance and principles of binomial nomenclature – valid and effective publication, typification, priority – rule of priority and its limitations – rejections, retention and choice of names –author citation.

UNIT 4: Study of the following families:

Magnoliaceae, Menispermaceae, Portulacaceae, Rhamnaceae

Vitaceae, Sapindaceae, Combretaceae, Myrtaceae,

Lythraceae, Molluginaceae, Sapotaceae, Boraginaceae,

UNIT 5: Oleaceae, Convolvulaceae, Bignoniaceae, Acanthaceae,

Verbenaceae. Amaranthaceae. Polygonaceae, Moraceae,

Cannaceae, Liliaceae, Cyperaceae and Poaceae.

Practicals:

Description of a species, based on herbarium and live specimens of the families mentioned in the theory, identification of key characters, both qualitative and quantitative preparation and use of keys at generic and specific levels. Diagnostic characters of families and their use in the preparation of key.

Field visits for at least 5 – 7 days to collect specimens on the spot in and out side the state. Submission of Field note book and not less than 25 herbarium sheets representing the families studied.

RECOMMENDED TEXTBOOKS

- Subramanian, N.S. 1995. Modern Plant taxonomy. Vikas Pub. House, New Delhi.

- Singh. V and D. K. Jain. 2012. Taxonomy of Angiosperms, Rastogi Publications, Meerut.

REFERENCE BOOKS

- V.Singh, P.C. Pande, D. K. Jain, 2014. Diversity and Systematics of seed plants, Rastogipublications, Meerut.
- O.P.Sharma, 2008 Plant Taxonomy.Tata MC Grow-Hill Publishing Company Ltd.
- Singh. G, 2012. Plant Systematics, Oxford & BH Publishing co Pvt Ltd New Delhi.
- B.P.Pandey, 2012.Taxonomy of Angiosperm.S. Chand CompanyLtd.
- Roseline, 2013. Botanical Nomenclature, MJP Publishers, Chennai.
- Lawrence, G.H.M. 1967, Taxonomy of Vascular Plants, Oxford 7 IBH Publishers
- Vashista, P.C. 1974. Taxonomy of Angiosperms S. Chand & Co.New Delhi.
- H.P.Pandey.2011. Plant Taxonomy – Principles and Practices.Silverline Publications, New Delhi.

JOURNALS

1. International Journal of Plant Sciences
2. International Journal of Systematic

E-LEARNING RESOURCES

1. <http://www.iaat.org.in>
2. <http://www.ipni.org>
3. <http://www.theplantlist.org>
4. <http://www.botany.si.edu/ing>
5. <https://www.uou.ac.in/BSCBO-201PDFTaxonomyofAngiospermandbiodiversity.pdf>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Discuss about the principles of taxonomy and major system of plant classification
CO2	Identify and describe the plant species
CO3	Study the floral symmetry of dicot and monocot flowers
CO4	Name the plant species and explain the taxonomical characters based on ICBN rules
CO5	Learned skills of herbarium and field note

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3
CO2	2	3	2	2	3
CO3	2	2	2	2	3
CO4	2	2	2	2	3
CO5	2	2	2	3	3

AVERAGE	2.2	2.4	2	2.2	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY
CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER 2
PAPER 9 – PRACTICALS – II
ANATOMY, EMBRYOLOGY, PALYNOLOGY, MICROBIOLOGY AND
TAXONOMY OF ANGIOSPERMS.

Practical Hrs:8 Hrs
Credit :4

Time: 4 hours
75

Max Marks :

Record : 10
Herbarium : 10

- 1 Find the binomial of **A** and **B** using Gambles' flora (3x2= 6 marks)
- 2 Refer **C** and **D** to their respective families giving reasons. Indicate their Taxonomic hierarchy and submit floral mount (4x2=8 marks)
- 3 Prepare an artificial key to identify the specimen **E F G H** (1x6=6 marks)
- 4 Prepare suitable Micro-preparation of **I** (1x5=5 marks)

5. Dissect and display any 2 developmental stages of **J**. Submit the preparation and draw diagrams (2x2 =4 marks)
6. Using suitable staining methods identify giving reasons the microorganisms in the given material **K** and submit the slide. (1x5=5marks)
7. Perform acetolysis and mount the pollen for valuation **L** (1X4=4 marks)
8. Cut T.S of **M**. Draw labelled diagram. Identify giving reasons. Submit slide for valuation. (1x5=5 marks)
9. Analyse the given macerate - **N**. Draw diagrams. (1 x 4 = 4 marks)
10. Spotters **O, P, Q & R** (4x2= 8 marks)

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER 2
PAPER 9 – PRACTICALS - II
ANATOMY, EMBRYOLOGY, PALYNOLOGY, MICROBIOLOGY AND
TAXONOMY OF ANGIOSPERMS.

KEYS

1. A Binomial name of the Taxonomic species
 B Binomial name of the Taxonomic species
2. C Family identification
 D Family identification
3. EFGH Keys

4. I Anther/ovary

5. J Embryo

6. K Any Food Sample

7. L Acetolysis Test

8. M Anatomy

9. N Macerate observation

10. O Anatomy spotter

- P Palynology spotter

- Q Microbiology Spotter

- R Taxonomy Spotter

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER 2
PAPER 9 – PRACTICAL - II
ANATOMY, EMBRYOLOGY, PALYNOLOGY, MICROBIOLOGY AND
TAXONOMY OF ANGIOSPERMS.

Practical Hrs:8 Hrs

Credit :4

COURSE OBJECTIVES

- To learn to identify the plants species by using Gambles flora
- To know the characters of plants belonging to the respective families
- To identify the different components of permanent tissues
- To understand the embryological features of anther and ovule
- To differentiate the different bacteria

KEYS

- A. Binomial name of Taxonomic species**
- B. Binomial name of Taxonomic species**
- C. Family Identification**
- D. Family Identification**

E,F,G,H Keys

I .Anther T.S - (*Datura* flower anther, *Crinum* flower anther or any other flower)

J. Embryo - Dissection of any two developmental stages(globular, heart shape, torpedo or mature) from *Tridax* flower

K. Any food sample - (Curd – Gram staining)

L. Acetolysis - pollen test

M. Anatomy- (Anomalous – Bignonia stem , Boerhaavia stem, Nyctanthes stem, Dracaena stem, Tinospora aerial root)

N. Maceration technique demonstration & observation

O. Anatomy spotter

(Micro slides/ photographs/diagrams-

Anomalous – Bignonia stem, Boerhaavia stem, Nyctanthes stem,

Dracaena stem, Tinospora aerial root

Nodal anatomy – uni – hibiscus, tri – polyalthia and nerium and multi- aralia

Secretory cells – laticifers , hydathode, nectarines, glandular cells)

P. Embryology spotter (micro slides) / **Palynology spotter** (Photomicrographs of pollen)

Development of embryo sac – uninucleate, binucleate, tetranucleate and

Eight nucleate

Ovule – orthotropous, anatropous and campylotropous types

Mature embryo dicot – capsella

Endosperm types- nuclear, cellular and helobial endosperm types)

Q. Microbiology spotter (micro slides/ photographs/ diagrams/ Apparatus/ spotter)

(bacterial cell, Plant virus structure, T Phage, mycoplasma, mercuric chloride, ethanol, micro filtration, HEPA filter, laminar flow, Autoclave, inoculation needle, batch culture, fermentor, sugar as preservative, salt as preservative, vinegar,

spoiled food, yeast, Cheese, curd , probiotic milk, biofertilizer-

Azospirillum, mycorrhiza, root nodules, Penicillin

R. Taxonomy spotter

(Inflorescences- raceme, cyme and special; fruits- simple- multiple and aggregate)

RECOMMENDED TEXTBOOKS

- Subramanian, N.S. 1995. Modern Plant taxonomy. Vikas Pub. House, New Delhi.
- Singh. V and D. K. Jain. 2012. Taxonomy of Angiosperms, Rastogi Publications, Meerut.

REFERENCE BOOKS

- Modern Practical Botany, vol- 2, 2012, B.P.Pandey, S.. Chand and Co., New Delhi.

JOURNALS

1. Plant Anatomy
2. International Journal of Microbiology

E-LEARNING RESOURCES

1. <http://www.biologydiscussion.com/essay/angiosperms-essay/taxonomy-of-angiosperms-aims-and-principles-essay-botany/76587>
2. https://www.researchgate.net/publication/326016880_taxonomy_of_angiosperms
3. <http://www.uou.ac.in/sites/default/files/slm/BSCBO-201.pdf>
4. <https://www.easybiologyclass.com/angiosperm-systematics-and-taxonomy-free-online-study-materials-and-lecture-notes/>
5. https://www.brainkart.com/article/TAXONOMY-OF-ANGIOSPERMS---Types-of-classification_996/

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Distinguish plant characters and identify the plant species
CO2	Explain the reasons for grouping the plants in a plant family
CO3	Find out the different developmental stages of embryo
CO4	Discuss the method of gram staining
CO5	Apply the pollen acetolysis method and describe the structure of pollen

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2015-2016

SEMESTER 2
SEMESTER 2 – Paper 10
MAJOR ELECTIVE – 3

PHYTOCHEMISTRY

Lecture Hrs:4 Hrs

Credit :3

THEORY

COURSE OBJECTIVES:

- To obtain the importance of phytochemistry and its scope
- To acquire knowledge on various types of drug preparation
- To understand the various phytochemical involved in therapeutics
- To gain knowledge of traditional and allopathy medicines
- To study certain important plant involved in home remedies

COURSE OUTLINE

- UNIT 1** Scope of Phytochemistry-, its importance in Pharmaceuticals industry. Types of Phytochemicals- Preliminary screening of Phytochemicals.
- UNIT 2** Glycosides (*Digitalis & Aloe*) - Definition, Natural sources, extraction methods and therapeutic values; Anthraquinone- separation, Characterization and Pharmacological effects. Flavonoids (Green tea) and Anthocyanins (Red Cabbage)- definition, natural sources, extraction methods, therapeutic values.
- UNIT 3** Coumarins (Definition, Natural sources- pharmacological properties and phytotoxicity). Terpenes- monoterpenes- Natural sources, medicinal and non-medicinal uses; Sesquiterpenes, diterpenes, triterpenes- Natural sources- pharmacological and toxicological effects; Tetraterpenes- Carotenoids-saponins (Natural sources and Therapeutic values); Volatile oils (Clove and Mentha) and Alkaloids (Papaver & Cinchona) – extraction methods- pharmacological effects.
- UNIT 4** Plant Tissue culture for enhancing secondary metabolite production (*Withania somnifera*, *Rauwolfia serpentine*, *Catharanthus roseus*, *Andrographis paniculata*, *Dioscorea sp.*)

UNIT 5 Application of phytochemicals in industry and healthcare; Biocides, Biofungicides, Biopesticides.

Study of plant examples used in traditional medicine as resource (active principles, structure, usage and pharmacological action) of modern medicine:

Withania somnifera, *Rauwolfia serpentina*, *Phyllanthus amarus*,

Gloriosa superba, *Bacopa monnieri*

RECOMMENDED TEXTBOOKS

- Thirugnanam, Akbarsha and Krishnamurthy. 2010. Indian Medicinal plants and Home Remedies. Selvi Pathippaham, Trichy.
- S. Singh and Subalakshmi 2013. Medicinal plants. Kalpaz Publications.
- C.K. Kokate, A.P. Purohit and S.B. Gokhale 2010. Pharmacognosy. Nirali Prakasan (Pub.) Repro India Ltd. Mumbai.

REFERENCE BOOK

- Park. 1990. A textbook of Community medicine.
- Zafar. R. 1994. Medicinal Plants of India. Satish Kumar Jain, for CBS Publishers, Delhi.
- Thirugnanam, Akbarsha and Krishnamurthy. 2010. Indian Medicinal plants and Home Remedies. Selvi Pathippaham, Trichy.
- S. Singh and Subalakshmi 2013. Medicinal plants. Kalpaz Publications.
- C.K. Kokate, A.P. Purohit and S.B. Gokhale 2010. Pharmacognosy. Nirali Prakasan (Pub.) Repro India Ltd. Mumbai.
- Panda. N. 2005. Handbook of Medicine, A. I. T. B. S. Publishers, Delhi.
- Muralia. S and A. Kumar Pathak. 2007. Medicinal and Aromatic Plants, Aavishkar Publishers, Jaipur.
- Romesh kumar Sud and Sudhir Kumar. 2004. Herbs: Culinary, Medicinal, Aromatic. Scientific Publishers, Jodhpur.
- John Jothi Prakash. E. 2003. Medicinal and Aromatic Plants. J. P. R. Publications, Tirunelveli.
- John Jothi Prakash. E. 2004. Medicinal Botany and Pharmacognosy. J. P. R. Publications, Tirunelveli.
- Manisha Tiwari and Vibha Tandom 2004. Medicinal Plants. ISHA Books, New Delhi.

Journals

1. Phytochemistry
2. Journal of Pharmacognosy and Phytochemistry

E-LEARNING RESOURCES

1. <https://onlinelibrary.wiley.com/doi/pdf/10.1002/jsfa.2740091104>

2. https://shodhganga.inflibnet.ac.in/bitstream/10603/17430/10/11_appendices.pdf
3. <https://www.sciencedirect.com/science/article/pii/S187439001400113X>
4. <https://explorepharma.wordpress.com/2010/09/07/pharmaceutical-uses-of-terpenoids/>
5. http://agritech.tnau.ac.in/horticulture/extraction_techniques%20_medicinal_plants.pdf

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Appreciate the importance of Ayurveda, siddha , unani and allopathic medicine
CO2	Discuss the types of phytochemicals and extraction methods
CO3	Find the importance of Turmeric, clove, Tulsi usage in day to day life
CO4	Explain the characters and pharmacological usage of certain medicinal plants
CO5	Describe the role of medicinal plant principles in modern medicine

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	2	3	3	2	3
CO4	3	3	3	3	3
CO5	3	2	3	3	3
AVERAGE	2.8	2.8	2.8	2.8	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER 2
PAPER 11
EXTRA DISCIPLINARY ELECTIVE 1
FOOD SCIENCE AND NUTRITION

Lecture Hrs:4 Hrs

Credit :3

THEORY

COURSE OBJECTIVES

- To know the different food crops and processing of food products
- To understand the importance of nutrients in our daily diet
- To learn the natural food toxicants

- To know about biochemical aspects of food
- To identify the symptoms of malnutrition and combating strategies

COURSE OUTLINE

UNIT 1 Different food groups and planning diets to meet the requirements of different social economic levels. Recommended allowances for Indians – basis for requirement, computation of the allowances, comparison of Indian recommended allowances with that of FAD/WHO standards.

UNIT 2 Pulses, grams, dhal and nuts, processing, composition, methods of cooking. Effect of processing such as soaking, roasting, germination and fermentation.

UNIT 3 Role of dietary fiber – digestion and utilization, protein, energy malnutrition, iron malnutrition. Strategies for combating malnutrition (role of novel protein and vegetable protein mixtures).

UNIT 4 Proteins and lipids, amino acid requirements, and amino acid pattern, essential amino acids and fatty acids. Indices of protein quality evaluation, role of essential fatty acids in the body effects of deficiency and excess of fat, role of fats in the etiology of atherosclerosis.

UNIT 5 Naturally occurring food toxicants, protease inhibitors, haemoagglutinins, cyanogens, saponins, allergens and toxic amino acids and naturally occurring carcinogen – their physiological role and prevention of toxicity.

RECOMMENDED TEXTBOOKS

- Mahtab.S Bamji, Kamala Krishnaswamy, G.N.V. Brahman.2016. A Textbook of Human Nutrition, CBS Publications.
- Mohini Sethi & Sethi Rao. 2013. Food Science: Experiments and Applications, CBS Publications.

REFERENCE BOOKS

- Sharma.2017. Food Science and Technology, CBS Publications.
- Potter Hotchkiss.2007. Food Science, CBS Publications.
- Gajalakshmi,2014. Nutrition Science, CBS Publications.
- Leung H.K. and Saulinkhe D.K. 1985. Advances in food sciences. Academic Press, New York.
- Plant Protein. Norton G.Ed. 1978. Butterworths, London.
- MO.Laren, 1979. Nutrition in the community.
- Dietrich Knorr, 1987. Food biotechnology. Macrel Dekker Inc. New York.
- Devadas R.P. 1972. Nutrition in Tamil nadu, Sangam Publishers.

- Jalliffe D.B. 1966. Assessment of the nutritional status of the community,WHO, Deneva.

JOURNALS

1. International Journal of Food Science and Nutrition
2. Journal of Nutrition and Health

E-LEARNING RESOURCES

1. http://agritech.tnau.ac.in/nutrition/nutri_food_diet_icmr
2. <https://www.eufic.org/en/food-production/article>
3. <https://ensure.com/health-articles-tips/nutrition/power-protein>
4. <https://www.healthknowledge.org.uk/public-health-textbook>
5. <https://ilsina.org/wp-content/uploads>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Plan the diet requirements of people and explain the Indian recommended allowances
CO2	Explain the method of cooking different food groups
CO3	Discuss the strategies involved in combating malnutrition
CO4	Identify the amino acid and protein requirements
CO5	List the food toxicants and its impact on health

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	2	3
CO2	2	3	2	2	3
CO3	3	3	2	2	3
CO4	3	3	2	2	3
CO5	3	3	2	2	3
AVERAGE	2.6	2.8	2	2	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2017-2018

SEMESTER 3

PAPER 12

PLANT PHYSIOLOGY AND BIOCHEMISTRY

Lecture Hrs:5 Hrs

Credit : 4

THEORY

COURSE OBJECTIVES

- To know about absorption, translocation and utilization of water and other minerals
- To understand changes during growth process (germination to senescence)
- To understand various photosynthetic and respiratory cycles
- To gain knowledge on biomolecules
- To study the behavior of plants under various environmental conditions

COURSE OUTLINE

- UNIT 1 :** Water and plant relations – water potential – Mechanism of water uptake and transport of water and ions – theories; Transpiration – movement and loss of water in plants – evapotranspiration – mechanism of stomatal movement; Mechanism of organic solute translocation: Münch pressure flow, phloem mechanism, loading and phloem unloading.
- UNIT 2:** Bio molecules: Carbohydrates - structure and classification ; Amino acids classification and properties of amino acids; Proteins - peptide bond, primary, secondary, tertiary and quaternary protein structure - super secondary structure – Ramachandran plot – denaturation of proteins.
- UNIT 3:** Enzymes : Nomenclature, classification and properties. Factors affecting enzyme activity. Enzyme kinetics-Michaelis - Menton constant – Mechanism of enzyme action - Enzyme inhibitors, enzyme regulation, Enzyme immobilization. Growth hormones – Mode of action and applications of auxins, gibberellins, cytokinins, ethylene, abscisic acid; Phytochromes – Photoperiodism, Vernalization, Abscission and Senescence.
- UNIT 4:** Photosynthesis: Ultra structure of chloroplast. Red Drop phenomenon - Emerson enhancement effect, Light harvesting systems. Electron transport system- cyclic and non-cyclic phosphorylation, photosynthetic carbon reduction (PGR) pathway in C3, C4 and CAM plants. RUBISCO.
- Respiration: Glycolysis - Krebs's cycle - Oxidative pentose phosphate pathway - oxidative phosphorylation - electron transport system - RQ - cyanide resistant respiration.
- UNIT 5:** Nitrogen metabolism - Range of nitrogen fixing organisms. Legume-Rhizobium symbiosis, biochemistry and physiology, Nitrogenase, Leghaemoglobin,

Nitrate reduction -Biochemistry. Assimilation of ammonia – Deamination - Transamination. Stress physiology - Drought and Salinity.

Practicals

- Colorimeter and spectrophotometer - principle and applications.
- To find complementary colour for different coloured solutions by using colorimeter.
- To verify Beer - Lambert Law using colorimeter.
- Estimation of carbohydrates by Anthrone reagent (colorimeter/ Spectrophotometer)
- Estimation of amino acids (colorimeter / Spectrophotometer)
- Estimation of proteins (Lowry et al., / Bradford method)
- Estimation of chlorophyll a, chlorophyll b and total chlorophyll by Arnon's method.
- Extraction and separation of leaf pigments by Paper chromatography.
- Determination of water potential by plasmolytic / Weighing method
- Determination of effect of chemicals and temperature on membrane permeability (colorimeter)
- Determination of rate of respiration of different respiratory substrates by titration methods.
- Determination of neutralization point of strong acid Vs strong base by titration method (using pH meter)
- Enzyme assay techniques – Catalase, Peroxidase, Amylase.

Demonstration:

- Dialysis
- Warburg Manometer.
- Preparation of buffers.
- Poly acrylamide Gel Electrophoresis (PAGE)
- Estimation of total nitrogen by Kjeldhal method.
- Thin layer and Column chromatography.

RECOMMENDED TEXTBOOKS

- S. S. Purohit, 2005. Plant Physiology, Student Edition Jodhpur.
- V. Verma, 2011. Plant Physiology, Ane Books Pvt. Ltd.

REFERENCE BOOKS

- Conn, E.E. and P.K. Stumph. 1976 Outlines of Bio-chemistry wiley eastern.
- Dr.S.K.Verma and Mohit Verma 2014. A textbook of Plant Physiology, Biochemistry and Biotechnology.Chand and Co publications
- Salisbury, F.B and Cleon Ross, 2007. Plant physiology, Wadsworth publishing company, Belmont.
- Pandey, S.N and Sinha, B .K 2001. Plant Physiology. Third revised edition,Vikas Publishing House Pvt. Ltd, New Delhi.
- Jain,V.K, 2007.Fundamentals of plant physiology , S. Chand & Compamy ltd, New delhi.
- Verma, V. 2008.Text book of plant Physiology, Ane's student edition, Newdelhi.

- Rastogi, S.C 2003. Outlines of Biochemistry , CBS Publishers & Distributors , New Delhi
- Conn E.E, Stumpf, Bruening G, Doi RH. 2005. Outlines of Biochemistry 5/Ed, Wiley & Sons Pvt .Ltd
- Satyanaryana U, Chakrapani U, 2006. Biochemistry, Books and Allied (P) Ltd.
- Gupta, S. N. 2014. A text Book of Bio chemistry, Rastogi Publications, Meerut,
- Srivastava, H.S. 2013. Elements of Biochemistry - Rastogi Publications, Meerut,
- Rajeshwari, M.R. 2012. Biophysics - Rastogi Publications, Meerut, New Delhi.

JOURNALS

1. The Journal of Physiology
2. The International Journal of Biochemistry & Cell Biology

E-LEARNING RESOURCES

1. <https://biology.homeomagnet.com/>
2. <http://www.els.net/WileyCDA/ElsArticle/refId-a0001288.html>
3. <https://www.toppr.com/guides/chemistry/biomolecule/>
4. <https://www.britannica.com/science/enzyme>
5. https://plantcellbiology.masters.grkraj.org/html/Plant_Cell_Biochemistry_And_Metabolism4-Nitrogen_Metabolism.htm
6. <https://photosynthesiseducation.com/photosynthesis-and-cellular-respiration/>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Discuss the mechanism of water uptake and loss of water by evapotranspiration
CO2	Elaborate the structure and classification of biomolecules
CO3	Explain the different types of enzymes and its properties
CO4	Describe ultrastructure of chloroplast and mechanism involved in it
CO5	Analyse the response of plants under extreme environmental conditions

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	3
CO2	2	3	2	3	3
CO3	2	3	3	3	3
CO4	2	3	3	3	3
CO5	2	3	3	2	3
AVERAGE	2	3	2.6	2.6	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY
CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER 3
PAPER 13
CELL BIOLOGY, GENETICS AND BIOSTATISTICS

Lecture Hrs:5 Hrs

Credit :4

THEORY

COURSE OBJECTIVES

- To understand the structure and function of cell, cell membrane and cell organelles
- To study the mitotic and meiotic divisions
- To study the inheritance and interactions of genes
- To find the importance of biochemical and population genetics
- To learn the basic concepts of statistics applied in the field of plant sciences

COURSE OUTLINE

- UNIT 1:** Occurrence, molecular / ultrastructure, chemical nature / composition and function of Plasma membrane, Endoplasmic reticulum, dictyosome, ribosome, lysosome, peroxisome, mitochondria, plastids and Nucleus
- UNIT 2:** Chromosome – structure and its types, nucleolar organiser – nucleosome-euchromatin and heterochromatin. Chromosome banding – C banding, G banding, R banding and Q banding. Cell division –cell cycle. Mitosis, Meiosis and significance.
- UNIT3:** Mendelian inheritance – Gene interaction - Multiple alleles, pseudo alleles, quantitative inheritance - polygenes; chiasma frequency - tetrad analysis -

chromosome mapping,. Extra nuclear inheritance - plastid - mitochondrial - Male sterility in corn; Sex determination in plants.

UNIT 4: Biochemical genetics - *Neurospora*, Beadle and Tatum

experiment - Chromosomal aberrations- Mechanism in mutation and its types Population genetics – gene frequency – Hardy – Weinberg law – Genetic drift.

UNIT 5: Biostatistics: Measures of central Tendency – Mean, Median, Mode –

Merits and demerits ; Measures of Dispersion - standard deviation

and standard error – merits and demerits; Probability - addition

and multiplication rule; Chi- square test - Null hypothesis -

Student's t- distribution- test for single mean; ANOVA – One way method

– Correlation - Regression

Practicals :-

Cell biology:

- Squash and Smear techniques.
- Study of induced aberrations in onion root tips employing chemicals and plant extracts. Calculation of aberration percentage of chemical treated onion root tip cells.
- Study of cellular organelles from electron micrograph, nuclear stains and pre-fixatives.

Genetics:

- Genetics problem based on the theory.
- Chromosome mapping

Biostatistics

- Quantitative analysis - Calculation of variation pattern in fruits / leaves / seeds standard deviation -standard error — based on the data given.
- Chi square test – problem

RECOMMENDED TEXTBOOKS

- P.S. Verma & V. K. Agarwal, 2009. Genetics. S. Chand & Comp. Ltd. New Delhi.
- S. P. Mishra, 2011. Evolution, Ecology, Cell Biology & Genetics. Silver line Publication, New Delhi.

REFERENCE BOOKS

- Lewis, J. Klerismilk and Valerie M. Kish 1995. Principles of Cell and Molecular Biology, harper Collins College Publisher.
- James D. Watson, Nunay H. Hopkins, Jeffrey W.D. Roberts J. A. Steitz and A.M. Weiner 1988. Molecular Biology of the Gene. Benjamin Lewin Cummins Publishing Company Inc. California.
- Cherayil, J.D. 1974, Gene and the Genetic Code. Tata McGraw Hill, New Delhi.
- Freifelder, D. 1992. Microbial Genetics, Narora Delhi.
- Gardner, E.J. and D.P. Snustad 1984. Principles of Genetics Wiley, New York.

- Kumar, H.D. 1993, Molecular Biology and Biotechnology, Vikas, Publication, Delhi.
- Lewing, R.A. 1976. The Genetics of Algae, Balckwell, Oxford.
- Reigner, R.A. A. Michalis and M.M. Green. 1976. Glossary of Genetics and Cytogenetics. Springer.
- Risley, 1991. Chromosome Structure and Function, Narosa.
- Sharma, A. 1990. The Chromosomes, Oxford and IBH, Delhi
- Sharma, A.K. and A. Sharma, 1980. Chromosome Technique - Theory and Practice, Butterworths, London.
- Sinha, U. and U. Sinha 1976, Cytogenetics, Plant Breeding and Evolution, Vikas, New Delhi.
- Watson J.D. N.H. Hopkins, H.J.W. Roberts, J.K. Steitz and A.M. Werner, 1987. Molecular Biology of the Gene.
- G. S. Miglani, 2007. Advanced Genetics. Narosa Publishing House, New Delhi.
- P.S. Verma & V. K. Agarwal, 2009. Genetics. S. Chand & Comp. Ltd. New Delhi.
- S. P. Mishra, 2011. Evolution, Ecology, Cell Biology & Genetics. Silver line Publication, New Delhi.

JOURNALS

1. Molecular and Cellular Biology
2. The Journal of Genetics and Genomics
3. Statistical Methods in Medical Research

E-LEARNING RESOURCES

1. <https://www.toppr.com/guides/biology/the-fundamental-unit-of-life/cell-organelle/>
2. https://en.wikibooks.org/wiki/Principles_of_Biochemistry/Chromosome_and_its_structure
3. <https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/mendelian-inheritance>
4. <http://www.nature.com/scitable/definition/hardy-weinberg-equilibrium-122>
5. <https://www.mun.ca/biology/scarr/Gr09-01.html>
6. http://sphweb.bumc.bu.edu/otlt/MPH-Modules/BS/BS704_BiostatisticsBasics/BS704_BiostatisticsBasics_print.html
7. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3469943/>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Describe the cell wall and plasma membrane
CO2	Discuss the cell organelles like Golgi complex, lysosomes, peroxisomes etc
CO3	Explain the different banding techniques of chromosomes
CO4	Bring out the mechanism of mutation in chromosomal aberrations

CO5	Evaluate the biostatic formulas in research data

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	3	3
CO2	2	3	2	3	3
CO3	2	3	3	3	3
CO4	2	3	3	3	3
CO5	2	2	3	3	3
AVERAGE	2	2.8	2.6	3	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2017-2018

SEMESTER 3

PAPER - 14

PLANT PATHOLOGY

Lecture Hrs:5 Hrs

Credit :4

THEORY

COURSE OBJECTIVES

- To study about the plant diseases caused by different types of pathogens
- To understand the disease symptoms, casual organisms- etiology of the diseases and control measures of certain diseases
- To study the morphological, anatomical and biochemical defence mechanisms
- To study the environmental impact in disease development
- To find the molecular method in pathogen identification

COURSE OUTLINE

UNIT 1: Plant diseases - Classification – based on occurrence - endemic, epidemic and sporadic – causal agents – Non parasitic, parasitic and viral. Koch's Postulates – Basic concept of infection- Molecular basis of infection – Methods of infection.

UNIT 2: A study of causal organism, symptoms, disease cycle and control measures of the following diseases:

1. Blast of rice; 2. Bacterial blight of rice; 3. Rust of wheat; 4. Smut of sugarcane
5. Wilt of cotton; 6. Early blight of potato; 7. Little leaf of brinjal; 8. Red rot of sugarcane; 9. Downy mildew of bajra and 10. Powdery mildew of cucurbits.

UNIT 3: Defence mechanisms – Innate: surface structures – structure of natural openings – inhibitors – suberized, lignified tissues – gum depositions –phenols – phenolic glycosides.

Induced: hypersensitivity – biological – cork – abscission.

Biochemical: Phenols and phytoalexins.

Control measures – Chemical and Biological

UNIT 4: Environmental impacts on disease development and epidemics, epidemiology and disease forecast – Light, temperature, humidity and soil. Host - Parasite interaction: Genetics of host parasite interaction - gene for gene hypothesis - vertical and horizontal resistance, molecular basis of disease resistance.

UNIT 5: Molecular plant pathology - Molecular diagnostics of pathogen in host tissue:ELISA- Identification of pathogen (fungal, bacterial, viral) resistance genes for transgenic plants.

Practicals:

- Study of diseases of local plants with special reference to those given in theory.
- Recording of symptoms
- Study of morpho - anatomical deformities induced due to a particular disease.
- Growth and reproduction of the pathogen
- Pathogenicity tests and establishment of Koch's postulates

- Laboratory testing of the efficacy of common fungicides.
- A study tour of 3-5 days duration to Agricultural research stations and related research centers. Collection of not less than 10 pathological specimen for submission.
- Preparation and submission of herbarium of pathological specimens – 10 sheets.

RECOMMENDED TEXTBOOKS

1. Rangaswami, G and A. Mahadevan, 1999. Diseases of Crop Plants in India. IV ed Prentice Hall.
2. Mehotra, R.S. 1980. Plant Pathology, Tat - Mc Graw Hill Publishing Co. Ltd.,

REFERENCE BOOKS

1. Dasgupta, M.K.1988. Principles of plant pathology, Allied Publ. Pvt. Ltd.,
2. Singh, R.S. 1983. Plant diseases, Oxford & IBH Publishing Co.
3. Singh, R.S. 1982. Plant pathogens. The fungi, Oxfords IBM Publi. Co.
4. Bilgrami, K.S. and Dube, H.S 1976. A textbook of Modern Plant pathology, Vikas Publishing house Pvt. Ltd.
5. Hussain etal Eds 1983. Recent advances in plant pathology Print House (India).
6. Baker, H.F and Cook, R.J. 1974. Biological control of plant pathogens, S. Chand&Co. Ltd.,
7. Day, P.K. 1974. Genetics of host - parasite interaction S. Chand & Co. Ltd.,
8. Vander Plank J.E. 1975. Principles of plant infection. Academic Press.
9. Chatterjee, P.B. 1997. Plant protection techniques Bharat Bharan.
10. Marsh, R.W. 1977. Systemic fungicides Longman.
11. Stroble G.A & Mathre, D.E. 1970. Outlines, of plant pathology, Van Nostrand Reinhold Co.
12. Agrios, G.N. 1998. Plant pathology 4th edition Academic Press.
13. Pandey, B. P. 2010. Plant Pathology, S. Chand& Co, New Delhi.
14. Sharma. P. D.2004. Plant Pathology, Rastogi Publications, Meerut.
15. Sharma. P. D.2006. Plant Pathology, Narosa Publishing house, Chennai.
16. Ravichandra N.G. 2013. Fundamentals of Plant Pathology. PHI Learning Private Ltd. New Delhi.

JOURNALS

1. The Journal of Plant Pathology (JPP)
2. Physiological and Molecular Plant Pathology

E-LEARNING RESOURCES

1. <http://ecoursesonline.iasri.res.in/course/view.php?id=143>
2. <http://www.britannica.com/science/plant-disease>

3. <https://www.apsnet.org/edcenter/disimpactmngmnt/topc/Pages/OverviewOfPlantDiseases.aspx>
4. <https://www.ncbi.nlm.nih.gov/pubmed/10906960>
5. <https://www.ncbi.nlm.nih.gov/pubmed/11701835>
6. https://link.springer.com/chapter/10.1007/978-3-642-66279-9_29
7. <http://agritech.tnau.ac.in/pdf/8.pdf>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Find the disease based on symptoms in the infected plants
CO2	Explain the plant pathogen interaction and forecast the plant disease based on environmental factors
CO3	Tell the use of ELISA in pathogen identification
CO4	Appreciate the importance of GM crops in disease resistance
CO5	Study and collect the specimens of plant pathology

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	2	3
CO2	2	2	2	2	3
CO3	3	2	3	3	3
CO4	3	2	3	3	3
CO5	3	2	2	3	3
AVERAGE	2.6	2	2.4	2.6	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2017-2018

SEMESTER 3

PAPER 15 – PRACTICAL – III

**PLANT PHYSIOLOGY AND BIOCHEMISTRY, PLANT PATHOLOGY,
CELL BIOLOGY, GENETICS AND BIOSTATISTICS**

Practical Hrs:8 Hrs

Credit :4

**Time: 4 hours
: 75**

Max Marks

Record :

10

Pathology herbarium : 05

- 1 Perform the experiments **A** and **B** assigned to you. Document your observations, data and results. Analyze and Interpret. (2x 7=14marks)
2. Solve the problem **C1** and **C2** (2x2= 4marks)
3. Cut sections of **D** and **E**. Mount in glycerin. Identify giving reasons. Submit the slide for valuation.
(2x5=10 marks)
5. Prepare an Acetocarmine squash / smear of **F**. Display any one stage of cell division. Submit slide for valuation
(1x4=4 marks)
6. From the given material **G**. find the mean and calculate the standard deviation with reference to its length. Present your data in the form of a graph.
(1x5= 5 marks)

7. Solve the problem **H**. (1x3= 3marks)
8. Identify and comment on **I, J, K, L** and **M**. (5x3=15 marks)

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2015-2016
SEMESTER 3
PAPER 15 – PRACTICAL - III

**PLANT PHYSIOLOGY AND BIOCHEMISTRY, PLANT PATHOLOGY, CELL
BIOLOGY, GENETICS AND BIOSTATISTICS**

PRACTICALS

COURSE OBJECTIVES

- To perform experiment for finding the biomolecules
- To do physiological experiments for understanding plant functions
- To learn the mitotic and meiotic division by squash and smear methods
- To gain knowledge on cell organelles and gene interactions
- To apply the statistics in plant sciences

Keys

A Biochemistry Individual Experiment

B Physiology Individual Experiment

- Colorimeter and spectrophotometer - principle and applications.
- To find complementary colour for different coloured solutions by using colorimeter.
- To verify Beer - Lambert Law using colorimeter.
- Estimation of carbohydrates by Anthrone reagent (colorimeter/ Spectrophotometer)
- Estimation of amino acids (colorimeter / Spectrophotometer)
- Estimation of proteins (Lowry et al., / Bradford method)
- Estimation of chlorophyll a, chlorophyll b and total chlorophyll by Arnon's method.
- Extraction and separation of leaf pigments by Paper chromatography.
- Determination of water potential by plasmolytic / Weighing method
- Determination of effect of chemicals and temperature on membrane permeability (colorimeter)
- Determination of rate of respiration of different respiratory substrates by titration methods.
- Determination of neutralization point of strong acid Vs strong base by titration method (using pH meter)
- Enzyme assay techniques – Catalase, Peroxidase, Amylase.

C1 & C2 Biochemistry Problems

D Fungi

E Fungi

F Cell Biology

G Biostatistics

H Chromosome Mapping

I Genetics spotter

J Cell Biology- Cell organelles

K Physiology set up

- Dialysis
- Warburg Manometer.
- Preparation of buffers.
- Poly acrylamide Gel Electrophoresis (PAGE)
- Estimation of total nitrogen by Kjeldhal method.
- Thin layer and Column chromatography.

L Plant Pathology spotter

M Plant Pathology spotter

RECOMMENDED TEXTBOOKS

1. Verma, V. 2008. Text book of plant Physiology, Ane's student edition, Newdelhi.
2. Mehotra, R.S. 1980. Plant Pathology, Tat - Mc Graw Hill Publishing Co. Ltd.,

REFERENCE BOOKS

- B.P.Pandey, 2010, Modern Practical Botany, Vol-3, S.Chand & Co

JOURNALS

1. Plant Physiology and Biochemistry
2. The Journal of Plant Pathology (JPP)

E-LEARNING RESOURCES

1. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/plant-physiology>
2. <https://www.britannica.com/science/plant-disease>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2985836/>
4. <http://www-naweb.iaea.org/nafa/pbg/public/manuals-pbg.html>
5. <http://gtu.ge/Agro-Lib/Principles%20of%20Plant%20Genetics%20and%20Breeding.pdf>

COURSE OUTCOMES

CO NO	CO STATEMENT

CO 1	Highlight the structure and function of cell organelles by observing micro photographs
CO2	Estimate quantitatively the amount of protein, sugar and amino acid present in plant tissue
CO3	Explain the physiological mechanism in various plants by performing experiments
CO4	Demonstrate the cell division experiments and explain the chromosomal aberrations
CO5	Identify the plant disease and explain the pathogen, symptoms and control measures of the plant disease

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER 3- Paper 16
MAJOR ELECTIVE - 4

APPLIED PLANT CELL AND TISSUE CULTURE

Lecture Hrs:4 Hrs

Credit : 3

THEORY

COURSE OBJECTIVES

- To have a clear knowledge of plant tissue culture techniques
- To study haploid production
- To have a basic understanding of the plant genetic transformation
- To gain knowledge on Cryopreservation
- To know the application of plant tissue culture

COURSE OUTLINE

- UNIT 1** Laboratory Organisation – Design of different laboratories and management. Methodologies – Aseptic techniques – Composition of Culture Media – MS Medium – B5 Medium– methods of sterilization – basic procedure for Aseptic transfer – Incubation of culture.
- UNIT 2** General Techniques of – Micropropagation, Initiation of Culture, Multiplication, Rooting – Hardening. Callus Culture – establishment – Organisation – Embryogenesis. Somaclonal & Gametoclonal variation, - Uses in crop improvement. Synthetic Seeds – Practical applications.
- UNIT 3** Shoot Tip / Meristem Culture for Virus free plants. – Chemotherapy – Thermotherapy – Virus indexing – Initiation – multiplication – Rooting – Hardening – Anther culture – Production of Haploids – Utilization of Haploids in Agriculture. Protoplast Culture – Protoplast isolation, purification, viability test – culture – regeneration. Somatic Hybridization – Protoplast fusion techniques – Chemical fusion – Electrofusion selection of fusion products.
- UNIT 4** Approaches and factors affecting the production of secondary metabolites, production of pharmaceutically important drugs – alkaloids – food additives and insecticides in invitro system.
- UNIT 5** Cryopreservation & Germplasm storage, Bioreactor – Types of bioreactors – Stirred tank, air lift – its uses in various fields – Application of Tissue Culture – Techniques in Agriculture, Horticulture & Forestry.

RECOMMENDED TEXTBOOKS

- M.K.Razdan. Plant Tissue Culture, Oxford & IBH Publications.
- N. Arumugam, L.M.Narayanan, A.Manni, A.M.Selvaraj, Padmalatha singh. Genetic Engineering, Saras Publications.

REFERENCE BOOKS

- H.S. Chawla. Introduction to Plant Biotechnology, Oxford & IBH Publications.
- R.Keshavachandran & K.V.Peter. Plant Biotechnology: Methods in Tissue Culture and Gene Transfer, Universities Press.

JOURNALS

1. Plant Cell, Tissue and Organ Culture (PCTOC: Journal of Plant Biotechnology)
2. Journal of Tissue Culture and Bioengineering

E-LEARNING RESOURCES

1. https://www.researchgate.net/publication/291056431_General_Techniques_of_Plant_Tissue_Culture
2. <https://biot202.files.wordpress.com/2015/09/plant-tissue-culture-third-edition-techniques-and-experiments-by-roberta-h-smith.pdf>
3. <https://pdfs.semanticscholar.org/a659/28fb510868651c5ac25ac4d04a98e79b3919.pdf>
4. <http://www.biologydiscussion.com/biotechnology/germplasm-conservation/germplasm-conservation-and-cryopreservation-with-diagram/10757>
5. <https://www.biotecharticles.com/Applications-Article/Plant-Tissue-Culture-Techniques-Applications-Advantages-and-Disadvantages-3805.html>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Explain the tissue culture media and composition
CO2	Discuss the various tissue culture techniques
CO3	Understand the culture of protoplast and fusion techniques
CO4	Appreciate the importance of tissue culture in secondary metabolite production
CO5	Discuss the various plant tissue culture plants raised in India

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	3
CO2	2	3	3	3	3
CO3	2	3	3	2	3
CO4	2	3	3	2	3
CO5	2	3	2	2	3
AVERAGE	2	2.8	2.8	2.4	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018

SEMESTER 3- Paper 17
EXTRA DISCIPLINARY ELECTIVE - 2

PRINCIPLES OF HORTICULTURE

Lecture Hrs:4 Hrs

Credit : 3

THEORY

COURSE OBJECTIVES

- To gain knowledge about ornamental and vegetable crops
- To acquaint the students about the basics of plant propagation
- To know about garden types, garden tools, manures and organic farming
- To understand the commercial importance of flowers and various fresh and dry floral arrangements
- To introduce about bonsai and its techniques

COURSE OUTLINE

- UNIT 1** Horticulture: Introduction – Ornamental and vegetable crops – Bonsai, Landscaping (principle and styles) – Lawns - Lawn making -types and maintenance. Topiary
- UNIT 2** Vegetative propagation of plants: stem cuttings, layering, budding, grafting, soil-less plants and hydroponics.
- UNIT 3** Garden – types, Layout, planning and design of kitchen garden, Cultivation of vegetables – ladies finger, tomato; flower garden, water garden. Garden tools and equipments
- UNIT 4** Floriculture: Introduction, potential and trade in India, Cultivation of commercially important plants like rose, jasmine, chrysanthemum, orchids and Anthurium. Flower arrangement – Fresh and dry.
- UNIT 5** Manure: Organic manure, Vermicompost, Biofertilizer. Pest control, plant growth regulators in horticulture.

RECOMMENDED TEXTBOOKS

- Jules Janick, 1982, Horticultural science, Surjeet Publication, New Delhi
- Jindal, S. L. 1982, Lawns and gardens, L.L. Auditorium, Govt. of India Press Nasik.
- J. B. Edmon et al., 1990, Fundamentals of Horticulture. Tata McGraw Hill Publishing Co. Ltd.. New Delhi.

REFERENCE BOOKS

- Manibhushan Rao, K, 1991, Text Book of Horticulture, MacMillan India pvt. Ltd. Delhi.
- Mathew, I.P. and S. K. Karikari, 1994, Horticulture; Principles and practice: MacMillan Press Ltd. Publ.
- Hudson. T . Hartmann et al., 1997, Plant Propagation: Principle and practice: prentice Hall of India Pvt. Ltd. New Delhi
- Marshall Woodrow, G. 1999, Gardening in India, Biotech Books, Delhi.
- Prasad S and U. Kumar, 1999, Principles of Horticulture, Agro Botanica, Bikaner, India.
- V.L.Sheela 2011. Horticulture, MJP Publishers.
- V.Kumaresan 2010. Horticulture, Saras Publications.
- N.Kumar, 2010. Introduction to Horticulture, OPx ford& IBH Publishing Co.Pvt. Ltd, New Delhi.
- Arora J.S. 1990. Introductory Ornamental horticulture. Kalyani publications
- Kumar, N. 1989. Introduction to Horticulture , Rajalakshmi Publications.

JOURNALS

1. Plant Cell, Tissue and Organ Culture (PCTOC: Journal of Plant Biotechnology)
2. Journal of Tissue Culture and Bioengineering

E-LEARNING RESOURCES

1. <https://www.britannica.com/science/horticulture>
2. <https://www.encyclopedia.com/plants-and-animals/agriculture-and-horticulture/horticulture/horticulture>
3. <https://www.thoughtco.com/vegetative-propagation-4138604>
4. http://agritech.tnau.ac.in/horticulture/horti_Vegetables.html
5. https://study.com/directory/category/Agriculture/Horticulture/Floriculture_Management.html
6. http://agritech.tnau.ac.in/org_farm/orgfarm_manure.html

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Explain various propagation methods based on the type of plants
CO2	Establish kitchen gardens scientifically

CO3	Find the market value of commercially important flowers and make floral arrangement independently
CO4	Discuss the application of growth hormone at different phases of plant growth.
CO5	Elaborate the types of manures and importance in horticulture

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	2	3
CO2	2	2	2	2	3
CO3	2	2	3	2	3
CO4	2	2	3	2	3
CO5	2	2	2	2	3
AVERAGE	2	2	2.4	2	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2017-2018

SEMESTER 4

PAPER 18

MOLECULAR BIOLOGY, BIOTECHNOLOGY AND BIOINFORMATICS

Lecture Hrs:6 Hrs

Credit : 4

THEORY

COURSE OBJECTIVES

- To understand the fundamental aspects of molecular biology , biotechnology and bioinformatics
- To know about DNA technology
- To learn the various gene regulation mechanism
- To obtain knowledge on sequencing methods
- To know the importance of biotechnology in agriculture and forestry

COURSE OUTLINE

UNIT 1: Nucleic acids - Base pairing and variations in base composition. Forms of DNA - Chargaff's rule - DNA size - fragility - melting curves -hydrophobic interactions — denaturation - renaturation - circular and superhelical DNA - topoisomerase - Transposons - repeated sequence.

DNA replication in Prokaryotes – Enzymes - DNA repair - replication in eukaryotes

UNIT 2:Transcription Concept of transcriptional unit- RNA polymerase - Classes of RNA molecules and their structures - transcription in pro and eukaryotes - splicing mechanisms, capping and polytailing - Reverse transcription. Preparation of DNA complementary to RNA.

Translation -Universal Genetic code, Transfer RNA and aminoacyl synthetase, Codon and anticodon interaction; Process of protein synthesis -Initiation, chain elongation and termination. Overlapping genes.

UNIT 3 : Gene concept – fine structure – split exons and introns. Gene functions – protein synthesis – genetic code. Regulation of gene expression. Positive and negative control – operon concept. Control systems in *lac* . Lac repressor – C-Amp. and *trp* operons – gene expression in eukaryotes.

UNIT4: DNA technology - isolation of nucleic acid, endonucleases. Recombinant DNA and genetic engineering - vector – plasmid, cosmid. - Genomic library –Sequencing of DNA, PCR - applications Transgenics - methodology to develop transgenics – insect resistance, weedidical resistance and salt resistance, Pros and Cons of transgenics.

UNIT 5: Biotechnology for agriculture and forestry - specific recent technology relevant to forestry - micro propagation - Synthetic seeds. Molecular tools for direct DNA transfer technology - microinjection - RFLP - RAPD. Sequencing – methods – Local – Global- Pairwise – multiple – BLAST – FASTA - Biological database, methods of protein structure prediction, Gene finding tools, Molecular phylogeny, pharmacogenomics.

RECOMMENDED TEXTBOOKS

- Lewis J. Kleirismith and Valerie M. Kish 1995. Principles of cell and Molecular Biology Harper Collins college publishers.
- James D. Watson. Nancy H. Hopkins, Jeffery W.P. Roberts, J.A Steitz and A.M. Weiner 1988. Molecular Biology of the Gene. The Benjamin Cummins Publishing Company, Inc. California.
- S.S.Purohit 2003. Biotechnolgy - Fundamentals and Applications. Student Ed. Jodpur
- Ramawat K,G 2012 Molecular Biology and Biotechnology. S.Chand & Co. Ltd.
- Dubey, R.C. 2014 Advanced Biotechnology. S.Chand & Co

REFERENCE BOOKS

- Williams H. Elliott Daphne D. Ellioff 1997. Biochemistry and Molecular Biology. Oxford Univ. Press Oxford.
- Kumar, H.D. 1993. Molecular Biology and Biotechnology, Vikas, Delhi.
- Asokan . P. 2007. Molecular Biology. Chinna Publications. Vellore, TN.
- Devid freifelder. 2008. Molecular Biology. Narosa Publishing House, New Delhi.
- Attwood T. K and Parry- Smith. D.J. 2001. Introduction to Bioinformatics. Pearson education Pvt. Ltd, Delhi.
- Arthur M. Lesk. 2003. Introduction to Bio – Informatics, Oxford University Press, New Delhi.

- Robert F. Weaver.2005. Molecular Biology, Mc Graw – Hill International Edition, Singapore.
- Chawla. H.S. 2007. Introduction to Plant Biotechnology, Oxford & IBH Publishing Pvt. Ltd. New Delhi.
- Ramawat K. G and S. Goyal, 2011. Comprehensive Biotechnology, S. Chand &Company Ltd. New Delhi.
- Sundara Rajan. S and Balaji. R, 2003. Introduction to Bioinformatics, Himalaya Publishing house, Delhi.
- Dubey, R.C. 2012 A text book of Book of Biotechnology. S.Chand & Co. Ltd.
- Treven M.D.S. Buffery, R.G. Goulding and F.Standary. 1987 Biotechnology. The Biological Principles. Tata Mc.Graw Hill.
- Ignacimuthu S. 1996. Basic Biotechnology, Tata Mc Graw hill.
- Kumar H.O. 1993. A text book of Biotechnology, East West Affiliated Press

JOURNALS

1. Journal of Molecular Biology
2. The Journal of Biotechnology
3. Journal of Bioinformatics and Computational Biology

E-LEARNING RESOURCES

1. [https://chem.libretexts.org/Bookshelves/Introductory_Chemistry/Book%3A_The_Basics_of_GOB_Chemistry_\(Ball_et_al.\)/19%3A_Nucleic_Acids/19.2%3A_Nucleic_Acid_Structure](https://chem.libretexts.org/Bookshelves/Introductory_Chemistry/Book%3A_The_Basics_of_GOB_Chemistry_(Ball_et_al.)/19%3A_Nucleic_Acids/19.2%3A_Nucleic_Acid_Structure)
2. <https://www.ncbi.nlm.nih.gov/books/NBK21514/>
3. <http://www.nature.com/scitable/definition/transcription-dna-transcription-87>
4. <https://www.ncbi.nlm.nih.gov/pubmed/7688132>
5. <https://biologydictionary.net/translation/>
6. <https://www.toppr.com/guides/biology/biotechnology-principles-and-process/processes-of-recombinant-dna-technology/>
7. <https://link.springer.com/content/pdf/bfm%3A978-3-662-10617-4%2F1.pdf>
8. <https://www.khanacademy.org/science/high-school-biology/hs-molecular-genetics/hs-biotechnology/a/dna-sequencing>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Study the structure of gene, and explain the prokaryotic and eukaryotic method of replication
CO2	Describe the process of transcription and protein synthesis in prokaryotes and eukaryotes

CO3	explain the Gene concept and lac operon and trp operon regulation mechanism
CO4	Discuss the various tools in DNA transfer technology
CO5	Analyse the gene sequence the using Bioinformatics

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	2	3
CO2	2	3	3	3	3
CO3	2	3	3	3	3
CO4	2	3	3	3	3
CO5	2	2	3	3	3
AVERAGE	2	2.8	2.8	2.8	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2017-2018

SEMESTER - 4

PAPER- 19

ENVIRONMENTAL BOTANY, PHYTOGEOGRAPHY AND REMOTE SENSING

Lecture Hrs:6 Hrs
: 4

Credit

THEORY

COURSE OBJECTIVES

- To give an insight into environmental biology ,pollution and microbial process in the environment
- To introduce the essential basics of phytogeographical regions , conservation strategies and remote sensing
- To understand the renewable and non renewable energy resources
- To study about environment and development
- To have in-depth knowledge plant conservation methods

COURSE OUTLINE

UNIT 1: Community Ecology –Morphological and Anatomical adaptations Methods of studying Community – Plant Sucession - Climax community. Ecosystem

ecology – Major Ecosystems – Lake, Desert, Forest. Ecosystem Modelling. Ecological Niche, Ecad, Ecotypes, Ecospecies; Raunkiaers life forms.

UNIT 2: Resources and Energy: Introduction – Renewable and Non-Renewable energy resources - Solar Energy – Geothermal, Wind, Wave, Biogas, Petrocrops, Alcohol from Biomass.

UNIT 3: Environmental Pollution : Air, Water and Soil. Noise pollution - effects and control measures. Climate change and Global warming. Introduction to Bioremediation. *Ex-situ* and *In situ* bioremediations.

UNIT 4: Environment and Development – International Biological Programme (IBP), Man and Biosphere (MAB), National Conservation Strategy (NCS), IUCN, National Parks, Biosphere Reserves, Green belt. Biodiversity – introduction, distribution, loss. Endangered species. Endemism – Red data book.

Conservation methods - *In situ* conservation and *ex situ* conservation. Gene Bank: Theory of gene banking, preservation, Institution of a gene bank. Gene banks at global level. Chipko movement.

UNIT 5: Study of geographical patterns - world flora: types, patterns and distribution. Age and area hypothesis. Continental drift and plant distribution, Human influence on post-glacial change. Remote sensing - GPS - GIS.

Practicals : Water analysis – p^H , conductivity, salinity, total hardness, turbidity.

Vegetation analysis – Quadrat method.

Spotting of phytogeographical regions in India in India map

(soil, vegetation, botanical gardens, national parks and sanctuary)

RECOMMENDED TEXTBOOKS

- Agarwal, V.P. 1978 Forests of India, Oxford & IBH.
- Benton, A.M. & Wernsen, Jr. W.F. 1976 Field biology and ecology. (III Edn) Tata Mc Graw – Hill.
- Odum, E. 1984, Basic Ecology, Saunders. International Publishers.
- R.S Shukla and P.S Chandal 2014 Ecology and Utility of Plants . S. Chand & Co Pvt Ltd.
- P.C.Das 2007 .Plant Ecology. AITBS Publishers India

REFERENCE BOOKS

- Collinson, A.S. 1988 Introduction to world vegetation. Unwin Hyman.
- Crawley, M.J. 1986 Ecology, Blackwell.
- Desh Bandhu & Veenu Bharadwaj 1972, Ecology and Development, Indian

Environmental Society, New Delhi.

- Ethjrington, J.R. 1975. Environmental Plant ecology, Wiley.
- Evic - R - Pianka 1978, Evolutionary Ecology, Harper & Row.
- Good Ronald 1974. The Geography of the flowering plants, Longman, London.
- Irshed Khan 1987. Wastelands afforestation. Oxford and IBH Publishing.
- Kormondy, E.J. 1984, Concept of Ecology. Prentice Hall, New Delhi.
- Kumar, H.D. 1977, Modern concept of ecology, Vikas.
- Lockwood, J.G. 1979. World Climatology, ELBS Pub. Oxford,
- Longman, K.A. and Janik, J. 1987. Tropical forest and its environment. Longman, London.
- Muller, D.D & Elleburg, 1974, Aims and methods of vegetation Ecology. Wiley.
- Myers, A.A. and Giller, P.S. 1988. Analytical Biogeography. Chapman and Hall, London.
- Pears, N. 1977. basic Biogeography. Longman, London.
- Puri, G.S Gupta, R.K. Meher - Homji and Puri, S. 1989. Forest Ecology (Vol I & II), Oxford & IBH Publ.
- Rao, D.N. Ahmed, K.J. and Yunus Singh, S.N. Perspectives in Environmental Botany. Print House, Lucknow.
- Sharma P.D. 1993. Environmental Biology and Toxicology. Rastogi & Co. Meerut.
- Silvertown, J.W 1982, Introduction to plant Ecology.
- Singh, K.P and Singh, J.S 1992 Tropical Ecosystem Ecology and management.
- Vander maarel, E. and Weqner, M.J.K. 1978. Plant species and plant communities. The Hague.
- Walter, H. 1973. Vegetation of the Earth and ecological systems of the Geo – Bio sphere.

JOURNALS

1. The Journal of Phytogeography and Taxonomy
2. Journal Environmental and Experimental Botany
3. International Journal of Remote Sensing

E-LEARNING RESOURCES

1. <https://openoregon.pressbooks.pub/envirobiology/chapter/4-4-community-ecology/>
2. <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/environmental-pollution>
3. <http://www.environmentalpollution.in/essay/biodiversity-types-importance-and-conservation-methods-with-diagram/311>
4. <https://www.e-education.psu.edu/geog432/node/114>

5. <https://www.polytechpanthers.com/ourpages/auto/2013/1/18/42050140/Geographic%20patterns.doc>
6. <http://mpcb.gov.in/envtdata/LSD-NEERI-%20Water%20Quality%20Analysis.pdf>
7. http://www.smtasmc.org/images/phytogeographical_regions_of_India.pptx

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Appreciate the various ecosystems with its flora and fauna
CO2	Describe the level of pollution and impacts on global warming
CO3	Explain the <i>invivo</i> and <i>invitro</i> conservation methods
CO4	Discuss the renewable and non renewable energy resources usage in India and at Global level.
CO5	Map the vegetation of particular area with the knowledge of remote sensing

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3
CO2	3	3	2	2	3
CO3	2	2	2	2	3
CO4	3	2	2	2	3
CO5	2	2	2	2	3
AVERAGE	2.6	2.4	2	2	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2015-2016

SEMESTER 4

PAPER - 20 PRACTICAL - IV

MOLECULAR BIOLOGY AND BIOTECHNOLOGY, ENVIRONMENTAL BOTANY, PHYTOGEOGRAPHY AND REMOTE-SENSING

Practical Hrs:6 Hrs
Credit :4

Time: 4 hours
:75

Max Marks

Subject code

Record

:10

1. Estimate the given physic chemical parameter in the given water/soil sample-A using an appropriate method(volumetric method) (1x10= 10marks)
2. Write the procedure of the preparation of **B** – synthetic seeds and submit the preparation for valuation. (1x10=10 marks)
3. 3. Outline the procedure of the experiment **C** assigned to you (1x7=7 marks)
4. 4. Perform a quadrat study of an area **D** (1x10=10 marks)
5. 4 Solve the problem **E1** and **E2** (2x4 = 8 marks)
6. 5. Comment on **F** (1x5 = 5 marks)
7. 6. Identify with reasons **G, H, I, J** and **K** (3x5=15 marks)

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2015-2016

SEMESTER 4

PAPER - 20

**MOLECULAR BIOLOGY AND BIOTECHNOLOGY, ENVIRONMENTAL BOTANY,
PHYTOGEOGRAPHY AND REMOTE-SENSING**

COURSE OBJECTIVES

- To know the molecular biology techniques involved in DNA, RNA and Protein
- To learn the experiments involved in environmental botany
- To understand the phytogeographic regions
- To study the details of remote sensing

KEY

1. A- Molecular Biology: Perform the estimation by volumetric method, write the procedure and observation.

2. B. Biotechnology: Prepare **synthetic seeds** and submit for valuation. Detailed procedure to be written

3 C. Protocols for molecular biology (Written only)

- Isolation of plasmid DNA
- Isolation of bacterial genomic DNA.
- Isolation of plant genomic DNA
- Isolation of RNA
- Separation of DNA by agarose gel electrophoresis
- DNA hybridisation by Southern Blotting
- RNA hybridisation by Northern Blotting

- Protein detection by Western Blotting
- Molecular cloning and screening for Recombinants
- RFLP technique
- DNA amplification by PCR

4 D. Ecology: Determination of floral community by **Quadrat Method** - To study frequency, density and abundance of different floral species (by graphical and tabular methods) present in the community.

5E1 & E2 - Two **Molecular Biology problems** to be chosen from the record note.

6. F. a) Estimate the amount of **DNA** in the given sample spectrophotometrically by Diphenylamine method .

OR

b) Estimate the amount of **RNA** in the given sample spectrophotometrically by Orcinol method.

7.Spotters

G- Ecology

- pH Meter (Digital as well as Pen type)
- Secchi Disc
- Pollutants - Mercury (heavy metal pollutant), Lead, Aluminium, CFC's
- Satellite generated photographs (applications of remote sensing)

H. Biotechnology spotter

- pUC Vector
- pBR Plasmid Vector
- X-ray Crystallography of protein
- Ethidium Bromide

I.Molecular biology spotter

- i) DNA - Cot Curve
- ii) DNA Melting Curve
- iii) L - Model of t RNA
- iv) Lac Operon

J. Toxicants

- i) DDT
- ii) Carbon Monoxide
- iii) Ethyl Methane Sulfonate

K. Maps

- i) National Parks in India
- ii) Wild Life Sanctuaries in India
- iii) Biosphere Reserves in India
- iv) Tropical Wet Evergreen forests in India
- v) Tidal Forests in India
- vi) Tropical Moist Evergreen Forest in India
- vii). Floristic Botanical Regions of India
- viii) Floristic Regions of the World

RECOMMENDED TEXTBOOKS

- Asokan . P. 2007. Molecular Biology. Chinna Publications. Vellore, TN.
- Ramawat K. G and S. Goyal, 2011. Comprehensive Biotechnology, S. Chand & Company Ltd. New Delhi.
- Sundara Rajan. S and Balaji. R, 2003. Introduction to Bioinformatics, Himalaya Publishing house, Delhi.

REFERENCE BOOKS

- Dubey, R.C. 2014 Advanced Biotechnology. S.Chand & Co.
- B.P.Pandey, 2010. Modern Practical Botany, S.Chand & Co.

JOURNALS

1. Molecular and Cellular Biology
2. Journal Environmental and Experimental Botany

E-LEARNING RESOURCES

1. https://www.researchgate.net/publication/320508474_Molecular_Biology_Laboratory_manual
2. <http://www.ug.edu.gh/mls/courses/mlab-213-introduction-molecular-biology-practical>
3. https://www.researchgate.net/publication/324586214_Environmental_science_-_A_practical_manual
4. https://vibhorjain.weebly.com/uploads/6/6/5/8/6658578/environmental_science_lab_manual2.pdf
5. <https://www.uib.no/en/course/MOL300>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Perform the experiments to analyse the physicochemical parameter of soil and water
CO2	Prepare the seed artificially and explain with its importance and handle the molecular biology experiments
CO3	Understand the species diversity in a particular area
CO4	explain the phytogeographical regions in Tamil Nadu and
CO5	Describe the pollutants and its impact in the environment

M.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

SYLLABUS Effective from 2015-2016

SEMESTER 4 – Paper 21

MAJOR ELECTIVE 3

BIO-INSTRUMENTATION AND BIO-TECHNIQUES AND COMPUTER APPLICATIONS

Lecture Hrs:4 Hrs

Credit : 3

THEORY

COURSE OBJECTIVES:

- To make students learn about modern instruments for various analytical works
- To acquaint the students with various techniques used in biological sciences
- To provide students with basic understanding and applications of separation techniques
- To acquire knowledge on radioactive elements and its applications
-

UNIT 1 : Microscopy - principles and working mechanism of

- a. Light microscope, b. Phase contrast microscope
- c. Dark field microscope d. Transmission electron microscope
- e. Scanning electron microscope

Photography – Digital Microphotography, camera lucida

UNIT 2 : Separation techniques - Chromatography – Principles - Paper Chromatography - TLC - Column Chromatography - HPLC - GC Electrophoresis - Gel - PAGE, AGE

Principle Microtomes -techniques – fixation - sectioning and staining;Centrifuge-
- differential and ultra-centrifuge

UNIT 3: Radioactive elements, nature of α , β and γ rays. Principle and working mechanism of Geiger- Muller and Scintillator Counter - Auto radiography - its applications.

UNIT 4: Growth - Definition, concept, measurement of growth,

Fungi- Dry weight, Fresh weight. Bacteria - colony count, haemocytometer.

Phases of growth, Growth curve Optical Density, Colorimetry-Photo colorimeter, Estimation of Phosphorus and Vitamins

Spectrophotometry - UV - visible spectroscopy, Bioreactors

UNIT 5: Components of a Digital Computer: Block diagram of digital computer- detail of input units, output units, central processing unit pointing devices, fast input devices. Exotic input/output devices. Secondary storage devices. Types of digital computer, structured computer. Organization: Various levels of digital computer, operating systems as resource manager Windows- basic concepts and commands, word processing, spreadsheets, computer graphics

RECOMMENDED TEXTBOOKS

- P. Palanisamy 2001. Research methodology. J.J. Publication, Madurai.
- Rev. Fr. Dr. S. Ignacimuthu 1990. Basic Biotechnology Tata Mc Graw hill.

REFERENCE BOOKS

- Kumar,H.D.1998..A textbook of Biotechnology-affiliated–East–West press Pvt. New Delhi
- J.N. Treivedi & R.B. Singh 2005. Essentials of Plant Techniques. Rastogi Publications, Meerut, New Delhi.
- S. Sundara Rajan 2005. Tools and techniques of Microbiology MJP Publishers..
- P.K. Gupta 2005Elements of Biotechnology.Rastogi Pub., Meerut, New Delhi.
- Gurumani. N. 2006 Research methodology for Biological Sciences, MJP Publishers.
- Ridgman, W.J. 1975. Experimentation in Biology. Blackie, London.
- Sabari Ghosal and A.K.Srivastava.2009. Fundamentals of Bioanalytical Techniques and Insrtrumentation.PHI Learning Pvt. Ltd. New Delhi

JOURNALS

1. International Journal of Biological Instrumentation
2. Journal of Bioprocessing & Biotechniques
3. International Journal of Computational Biology and Drug Design

E-LEARNING RESOURCES

1. https://www.wikilectures.eu/w/Microscopic_techniques
2. https://cw.fel.cvut.cz/wiki/_media/courses/a6m33zsl/microscopic_techniques.pdf
3. <https://www.kullabs.com/classes/subjects/units/lessons/notes/note-detail/289>
4. <https://amrita.olabs.edu.in/?brch=2&cnt=1&sim=96&sub=73>
5. <https://study.com/academy/lesson/what-are-radioactive-elements.html>
6. <https://www.britannica.com/science/bacteria/Growth-of-bacterial-populations>
7. [https://chem.libretexts.org/Bookshelves/Physical_and_Theoretical_Chemistry_Textbook_Maps/Supplemental_Modules_\(Physical_and_Theoretical_Chemistry\)/Kinetics/Reaction_Rates/Experimental_Determination_of_Kinetcs/Spectrophotometry](https://chem.libretexts.org/Bookshelves/Physical_and_Theoretical_Chemistry_Textbook_Maps/Supplemental_Modules_(Physical_and_Theoretical_Chemistry)/Kinetics/Reaction_Rates/Experimental_Determination_of_Kinetcs/Spectrophotometry)
8. <https://www.britannica.com/technology/computer>

COURSE OUTCOMES

CO NO	CO STATEMENT
CO 1	Apply the concepts of bioinstruments in scientific research
CO2	Explain how to Handle the bioanalytical techniques
CO3	Discuss the method of Operating and optimizing the experimental conditions of different analytical techniques
CO4	Draw the microscopic details of specimens using camera lucida
CO5	find the method of measuring growth in different phases

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	2	3
CO2	2	2	3	3	3
CO3	2	2	3	3	3
CO4	2	2	3	3	3
CO5	2	2	2	3	3
AVERAGE	2	2	2.8	2.8	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

M.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2015-2016
SEMESTER 4 – Paper 22
PROJECT

Lecture Hrs:5 Hrs
Credit : 4

To plan and design, retrieve relevant literature, organize and conduct, process the data, photograph relevant observations and evaluate by statistical programs. The work has to be conducted in the department under the guidance of the project Supervisor. Interdisciplinary collaborations from external departments or Institutions can be organized only for essential areas of the project.

PROJECT HEADINGS	MARKS

INTRODUCTION	05

REVIEW OF LITERATURE	05

METHODOLOGY	20

RESULTS AND DISCUSSION	35

SUMMARY	05

BIBLIOGRAPHY	05

TOTAL	75

PROJECT VIVA	25

TOTAL	100

QUAID-E-MILLATH GOVT. COLLEGE FOR

**QUAID-E-MILLATH GOVT. COLLEGE FOR WOMEN
(Autonomous)**

Anna salai, Chennai - 600 002.

**B.Sc PLANT BIOLOGY AND
PLANT BIOTECHNOLOGY**

SYLLABUS



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

OFFERED FROM THE ACADEMIC YEAR 2017-2018

WOMEN
(Autonomous)
Anna salai, Chennai - 600 002.

**B.Sc PLANT BIOLOGY AND
PLANT BIOTECHNOLOGY**

SYLLABUS



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

OFFERED FROM THE ACADEMIC YEAR 2017-2018

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QUAID – E- MILLETH GOVERNMENT COLLEGE FOR WOMEN,
(AUTONOMOUS)
CHENNAI – 600 002

Undergraduate Courses
Choice Based Credit System

Quaid – E- Millath Government College for Women (Autonomous) offers the semester System of Education with credits for UG courses. Credit simply means the weightage given to what is taught and what is learnt. It is normally related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design, Each course is designed variously under lectures/ tutorials/ laboratory work/ seminar/ Practical training etc to facilitate effective teaching and learning and the credits are assigned according, depending on the content and the specialization.

The minimum credit requirement for a three – year UG course shall be 140.

B.Sc. DEGREE COURSE

RULES AND REGULATIONS

1. Duration

- a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semesters, the second academic year, the third and fourth semesters and the third academic year, the fifth and sixth semesters.
- b. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year.

2. Course of study

Te course of study for Bachelor Degree courses shall comprise of the following

Part I & II – Foundation courses

- I. Part- I Tamil
- II. Part II English

Part III

- a. Core Subjects
- b. Allied Subjects

Part IV

- a. Softskill (4 Papers)
- b. Non- Major Elective (2 Papers)
- c. Environmental Studies
- d. Value Education

Compulsory Core Module course in Environmental studies consisting of 2 extra credits, Value education – 2 Credits, Soft skills – 8 Credits (2 credits each). Non-Major elective – 4 credits (2 credits each)

Part V

Compulsory Extension service

A candidate shall be awarded a maximum of one credit for compulsory Extension service. All students shall have to enroll for NSS/NCC/YRC/RRC/Sports and Games/Consumer club/Enviro club/Leo club or any other service organization in the college and shall have to put in compulsory attendance of 40 hours, which shall be duly certified. If a student lacks 40 hours attendance in the First year, she shall have to compensate the same during the subsequent years.

Students who complete the minimum attendance of 40 hours in One Year only will get credit and those who complete the attendance of 80 or more hours in Two years will get 1 credit.

PROGRAMME OUTCOMES

On completion of the Programme, the learner is able to:

1. Apply practical and mathematical skills in all aspects.
2. Identify quality knowledge of the subject.
3. Utilize the subject knowledge and communication skills to appear for competitive exams.
4. Acquire theoretical, practical and mathematical knowledge
5. Analyse the basic computational skills.

PROGRAMME SPECIFIC OUTCOMES

PSO1: Identify the diverse groups of plant and microbial groups along with the genetical correlation.

PSO2:. Learn in general about the basic structural aspects of specific plant groups studied in relation to their taxonomic hierarchy and evolution and economic importance

PSO3: Appreciate the relationship between structural and functional adaptations of plants of all era.

PSO4: Obtain in depth knowledge on specific plant genera, physiological aspects, biotechnology techniques and their numerically quantifiable applications, along with the microbial interrelationship.

PSO5: Learn the commercial applicative values of the diversely classified plant groups.

From 2017-2018
Credits & Marks Consolidation – B.Sc.

Subject Component	No. of Papers	Total Marks	Total Credits
Part I - Language	4	400	12
Part II – English	4	400	12
Total	8	800	24
Part III			
Core	15	1500	64
Elective	3	300	15
Allied	6	600	20
Total	23	2300	99
Part IV			
NME	2	200	4
Soft Skills	4	400	8
EVS	1	100	2
VE	1	100	2
Total	8	800	16
Part V			
Extension Activities			1
Grand Total	40	4000	140

B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
CHOICE BASED CREDIT SYSTEM - FRAMEWORK OF SYLLABUS 2017-2018 ONWARDS

SE M	SUBJECT	SUB CODE	TITLE OF PAPERS	LECT. HRS.	CA	SE	TOTAL MARKS	CREDITS
I	TAMIL		PAPER - I	4	25	75	100	3
	ENGLISH		PAPER - I	4	25	75	100	3
	CORE		PAPER – I PHYCOLOGY,MYCOLOGY & LICHENOLOGY	6	25	75	100	5
	CORE (P)		PAPER – II PRACTICAL – I (PHYCOLOGY, MYCOLOGY & LICHENOLOGY)	6	25	75	100	5
	ALLIED		CHEMISTRY - I	6	25	75	100	5
	NME – I		NON MAJOR ELECTIVE– ARTS	2	40	60	100	2
	SOFT SKILL - I		SOFT SKILLS – ENGLISH DEPT.	2	40	60	100	2
II	TAMIL		PAPER – II	4	25	75	100	3
	ENGLISH		PAPER – II	4	25	75	100	3
	CORE		PAPER – III BRYOPHYTES & PTERIDOPHYTES	6	25	75	100	4
	CORE (P)		PAPER – IV PRACTICAL – II (BRYOPHYTES & PTERIDOPHYTES)	6	25	75	100	4
	ALLIED		CHEMISTRY - II	4	25	75	100	3
	ALLIED		CHEMISTRY - PRACTICALS	2	25	75	100	2
	NME – II		NON MAJOR ELECTIVE – ARTS DEPT.	2	40	60	100	2
III	SOFT SKILL - II		SOFT SKILLS – ENGLISH DEPT.	2	40	60	100	2
	TAMIL		PAPER – III	4	25	75	100	3
	ENGLISH		PAPER - III	4	25	75	100	3
	CORE		PAPER – V GYMNOSPERMS, PALAEOBOTANY & EVOLUTION	4	25	75	100	4
	CORE (P)		PAPER – VI PRACTICAL III (GYMNOSPERMS, PALAEOBOTANY & EVOLUTION)	4	25	75	100	4
	ALLIED		ZOOLOGY – I	5	25	75	100	5
	SOFT SKILL – III		SOFT SKILLS - BOTANY DEPT.	2	40	60	100	2
IV	EVS	-	ENVIRONMENTAL STUDIES	2				-
	TAMIL		PAPER – IV	4	25	75	100	3
	ENGLISH		PAPER – IV	4	25	75	100	3
	CORE		PAPER – VII CELL BIOLOGY, ANATOMY & EMBRYOLOGY	6	25	75	100	4
	CORE (P)		PAPER – VIII PRACTICAL – IV (CELL BIOLOGY, ANATOMY & EMBRYOLOGY)	4	25	75	100	4
	ALLIED		ZOOLOGY – II	3	25	75	100	3
	ALLIED		ZOOLOGY – PRACTICALS	2	25	75	100	2
	SOFT SKILL – IV		SOFT SKILLS - BOTANY DEPT.	2	40	60	100	2
	EVS		ENVIRONMENTAL STUDIES	1	40	60	100	2
V	EXTENSION	-	EXTENSION ACTIVITIES					1
	CORE		PAPER – IX GENETICS, PLANT BREEDING & BIOSTATISTICS	5	25	75	100	4
	CORE		PAPER – X MORPHOLOGY, TAXONOMY & ECONOMIC BOTANY	5	25	75	100	4
	CORE		PAPER – XI PLANT ECOLOGY & PHYTOGEOGRAPHY	5	25	75	100	4
	CORE (P)		PAPER – XII PRACTICALS V (TAXONOMY, GENETICS)	3	25	75	100	4
	ELECTIVE		ELECTIVE –I PLANT PROTECTION	5	25	75	100	5

	VE		VALUE EDUCATION	1				-
VI	CORE		PAPER –XIII PLANT BIOCHEMISTRY & PLANT PHYSIOLOGY	6	25	75	100	5
	CORE		PAPER – XIV MOLECULAR BIOLOGY, PLANT BIOTECHNOLOGY & BIOINFORMATICS	6	25	75	100	4
	CORE (P)		PAPER –XV PRACTICAL VI (BIOCH, PHYSIO,ECOL, BIOTECH)	6	25	75	100	5
	ELECTIVE		ELECTIVE –II HORTICULTURE	5	25	75	100	5
	ELECTIVE		ELECTIVE –III MICROBIOLOGY	5	25	75	100	5
	VE		VALUE EDUCATION	1	40	60	100	2
TOTAL				180		4000		
140								

ALLIED BOTANY

SEM	SUBJECT	SUB CODE	TITLE OF PAPER	LECT. HRS.	CA	SE	TOTAL MARKS	CREDITS
III	ALLIED		PAPER -I ALLIED PLANT BIOLOGY AND PLANT BIOTECHNOLOGY	6	25	75	100	5
IV	ALLIED		PAPER -II ALLIED PLANT BIOLOGY AND PLANT BIOTECHNOLOGY	4	25	75	100	3
			ALLIED PRACTICAL	2	25	75	100	2

EVALUATION PATTERN FOR CA

Distribution of marks for Continuous Assessment:- Theory

Part I, Part II & Part III

Test		Total	Assignment/Seminar/ Creative Presentation/ Assignment on glossary			Model Exam	Attendance	Total	Reduced to
1	2	40	1	2	3	25	10	100	25
20	20		10	10	5				

Test (two) : 40 Marks

Assignment / Seminar/ Creative Presentation/
Assignment on glossary : 25 Marks

Model Examination : 25 Marks

Attendance ` : 10 Marks

Attendance percentage

90 & above : 10 Marks

80 & above : 9 Marks

75 & above : 8 Marks
 65 & above : 7 Marks
 55 & above : 6 Marks

End Semester Theory Examination: Question Paper Pattern:

Section A Short answers(answer ANY TEN questions) : 10 X 2 = 20 Marks
 Section B Paragraph answers : 5 X 5 = 30 Marks (5 out of 8)
 Section C Essay : 3 X 10 = 30 Marks (3 out of 5)
 Total : 75 Marks

Distribution of CIA marks – Practical

Submission of observation : 30 Marks
 Tests on Spotters : 20 Marks
 Practical Model Exams : 50 Marks
 Total : 100 Marks
 Reduced to : 25 Marks

End Semester Practical Examination: Question Paper Pattern:

Practical Maximum marks : 75
 (Given in the Syllabus)

Part IV

Semester End Examination : 60 Marks
 Continuous Internal Assessment : 40 Marks

Distribution of CIA Marks:

Seminar/Presentation	Assignment / Term Paper	Written/ Oral Test	Total
20	10	10	40

Semester End Exam: Theory Paper : 60 Marks - Duration : 2.30 hours

Question paper pattern: 10x6 Marks = 60 Marks (10 out of 15)

B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER – I
CORE PAPER – I
PHYCOLOGY, MYCOLOGY & LICHENOLOGY

Lecture Hrs : 6 Hrs

Credits:5

THEORY

COURSE OBJECTIVES

- To acquire knowledge about the diversity of lower forms of plant kingdom – algal, fungal and lichen groups.
- To transmit information about applied aspects of the organisms listed in the syllabus
- To study the specified forms in natural conditions (field trips) as well as in the laboratory\.

COURSE OUTLINE

UNIT I: Distribution, General characters, thallus structure, pigmentation, reserve food material, reproduction and life cycles of algae. Classification of Algae (Silva & Parker, 1982). Contributions to Phycology by F.E Fritsch and MOP Iyengar.

UNIT II: Detailed study of structure, reproduction and life cycles (excluding developmental studies) of :

- a) Cyanophyta - *Oscillatoria*
- b) Chlorophyta - *Chorella, Volvox*

- c) Phaeophyta - *Sargassum*
- d) Rhodophyta - *Gracilaria*
- e) Bacillariophyta - *Diatoms (Navicula)*

UNIT III: General characteristic features – Occurrence, mode of nutrition and reproduction of fungi. Classification of fungi (Alexopoulos CJ, Mims CW, Blackwell M, 1996). Contribution to Mycology (E J Butler and T S. Sadasivan). Structure and reproduction of Lichen – *Usnea*.

UNIT IV: Detailed study of structure, reproduction and life cycles

- a) Oomycetes - *Albugo*
- b) Ascomycetes - *Penicillium*
- c) Basidiomycetes - *Agaricus*,
- d) Deuteromycetes - *Cercospora*,

UNIT V: Economic importance of algae and fungi with reference to agar, alginate, Diatomaceous earth, mushroom, mycorrhizal applications (VAM) and SCP. Economic importance of lichens.

PRACTICALS:

1. A detailed study of structure of thallus and reproductive structures of types given in the syllabus and submission of record.
2. A field trip to be undertaken for collecting algal specimen and observation of mushroom rearing mentioned in the syllabus.

Recommended Text Books:

1. S.N. Pandey and P.S. Trivedi 2009. A Text book of botany Vol-I, Vikas Publishing House Pvt. Ltd.
2. Pandey B P 2012 Botany for degree students I year S. Chand & Co.
3. Singh, V., Pandey, P.C. and Jain, D.K., 1998. A Text Book of Botany for Undergraduate students, Rastogi Publications
4. Paasiyiyal (Tamil Book) by Chandrasekar
5. Naveena Poonjaiyiyal (Tamil Book) by Chandrasekar
6. Poonjaiyiyal S. Dhanyakumar, Tamilnadu paada nool niruvanam
7. Thallophyta V.K. Sundralingam, Tamilnadu paada nool niruvanam

Reference Books:

1. Peter R.Bell, Alan R. Chapman, V.J. & Chapman, D.J.1980, The Algae, Macmillan.
2. B.R.Vashista, A.K.Sinha, V.P.Singh 2012. Botany for Degree Students Algae, S.Chand& Company Ltd., New Delhi.
3. South, G.R. &Whitlick 1989. Introduction to Phycology Black Wall Scientific Publications
4. Alexopoulos, C.J. & Mims. C.V. 1988.Introductory Mycology, John Willey & Sons.
5. Gopinath A 1986 A Text book of Botany Vol I ,Tata Mcgraw Hill Publication
6. Sambamoorthy A V S 2005 A Text book of Algae I K International pvt ltd.

JOURNALS

1. Journal of Phycology
2. International Journal on algae
3. Algal Research – Biomass, Biofuel and Bioproducts– Elsevier

E – LEARNING RESOURCES

- 1.<https://biologyreader.com/mucor.html>
2. <https://www.schweizerbar.de>
3. <http://chapmanlab.lsu.edu/> -- algae gallery at chapman lab
4. <http://www.richard-seaman.com/Fungus/links.html>
5. <http://www.myfg.org.uk/links.htm>

COURSE OUTCOMES

CO NO.	CO STATEMENT
1	Obtain knowledge on Classification of Lower Plant Groups
2	Understand the general characters of algae, fungi and lichens through specific examples
3	Obtain a detailed account of Structural and Functional aspects of algal genera
4	Obtain a detailed account of Structural and Functional aspects of fungal genera
5	Appreciate the economic importance of algae, fungi and lichens

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3
CO2	3	3	2	2	3

CO3	2	3	3	2	3
CO4	3	3	3	2	3
CO5	2	2	2	2	3
AVERAGE	2.6	2.8	2.4	2	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SEMESTER – I
CORE PAPER II - PRACTICAL – I
PHYCOLOGY, MYCOLOGY & LICHENOLOGY**

Practical Hours: 6 hours

Credit:4

PRACTICALS

COURSE OBJECTIVES

- To identify algal specimens based on morphological criteria
- To study the internal structure of the algal specimen
- To identify the fungal genera based on internal structure of the affected plant part

KEY

1. A - Algal Mixture - *Oscillatoria-Chlorella*, *Oscillatoria-Volvox*,
Chlorella-Volvox
2. B- ALGAE - *SSargassum Axis T.S* ,*Gracilaria* Thallus T.S

C - FUNGI *Albugo* – infected leaf T.S, *Agaricus* basidiocarp V.S ,
Cercospora infected leaf T.S

3. SLIDES

- D- *Chlorella*, *Oscillatoria*, *Volvox* colony, *Navicula*, *Sargassum* male & female conceptacle, *Gracilaria* cystocarp VS.
E- *Penicillium* conidia, *Albugo* conidia
F- *Usnea* thallus TS

4. SPOTTERS

- G – *Sargassum* habit, *Gracilaria* habit
H- *Albugo* (infected leaf), *Cercospora* (infected leaf), *Agaricus* basidiocarp
I- Apothecium of *Usnea*

5. ECONOMIC IMPORTANCE

- J - Algae: SCP, Agar-Agar, Alginate, Diatomaceous earth
K- Fungi: Penicillin, Mycorrhiza (VAM), *Pleurotus* mushroom
L- Lichen: Usnic acid, Litmus

COURSE OUTCOMES

CO No.	CO STATEMENT
1	Able to identify and differentiate the algal groups and genera.
2	Recognise the algal genera based on anatomical differences.
3	Able to identify the specific algal, fungal and lichen based on morphological characters.
4	Identify the fungal genera based on reproductive structures.
5	Point out the economic importance of the studied plant groups

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER – I
CORE PAPER – II
PRACTICAL I**

Time:3 hours

MAXIMUM :75 MARKS

PRACTICAL :65 MARKS

RECORD :10 MARKS

1. Identify the 2 algae from the algal mixture A given to you by performing a wet mount of the same. Draw labeled diagrams.

A யில் கொடுக்கப்பட்டுள்ள 2 பாசி மாதிரிகளை அடையாளம் கண்டுகொண்டு படம் வரைக
(2x5=10 marks)

2. Cut transverse section of B & C. Stain and mount in glycerine. Draw labeled diagrams. Identify giving reasons. Leave the slide for valuation

B & C ஆகியவற்றின் குறுக்கு வெட்டு எடுத்து கண்ணாடித்துண்டத்தில் மதிப்பீட்டிற்கு வை.
காரணங்களை கூறு. படம் வரைந்து பாகங்கள் குறி.

(2x 8 =16 marks)

3. Draw diagram and write notes of interest on D, E & F

D, E மற்றும் F ஆகியவற்றிற்கான படம் வரைந்து குறிப்புகளை எழுதுக

Identification – 1 Classification-1, diagram -1, notes – 2) (3x5=15 marks)

4. Name the genus, group and morphology of the given part of G , H & I

G, H மற்றும் I - கொடுக்கப்பட்ட பகுதிகளின் புறத்தோற்றம், தொகுதி மற்றும்
பேரினம் எழுதவும்

(3x3=9 marks)

5. Identify and write the notes on the economic importance of J, K and L

J, K மற்றும் L வினை கண்டறிந்து பொருளாதார முக்கியத்துவத்தினை பற்றி குறிப்பு
எழுதவும்.

(3x5=15 marks)

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SEMSETER- I
CORE PAPER II– PRACTICAL - I**

MARKING SCHEME

1. A - 2 Algae (2x5=10 marks)
Identification -1, classification-1, diagram -3

2. B - Algae
C - Fungi

(Classification & identification- 2, Diagram – 1, Notes –3,slide – 3)
(2x8=16 marks)

3. D - Algae
E - Fungi
F - Lichen

(Classification-1, identification – 1, Diagram – 1 ,Notes –2) (3x5
=15marks)

4. G - Algae
H - Fungi
I - Lichen apothecium

(Genus – 1, Group – 1, Morphology – 1) (3x3= 9 marks)

5. J - Algae
K - Fungi
L - Lichen

(3x5 =15 marks)

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER – II
CORE PAPER - III
BRYOPHYTES AND PTERIDOPHYTES

Lecture Hours : 6 Hours

Credits:5

THEORY

COURSE OBJECTIVES

- To impart theoretical as well as practical knowledge on the higher plant forms of taxonomic hierarchy
- To study the economic importance of selected forms.
- To understand the variations in the forms under natural habitats by way of field trips

COURSE OUTLINE

- UNIT I:** Occurrence and distribution. General characteristics and Classification of Bryophytes (Watson 1955). Phylogeny and economic importance of Bryophytes.
- UNIT II:** Thallus structure, reproduction and life cycle of the following genera (excluding developmental studies) :
(1) *Marchantia* (2) *Anthoceros* (3) *Funaria*
- UNIT III:** Occurrence and distribution. General characteristics, Classification of Pteridophytes. (Reimer, 1954). Economic importance of Pteridophytes.
- UNIT IV:** Structure, reproduction and life cycle of the following genera (excluding developmental studies) :
(1) *Lycopodium* (2) *Equisetum* (3) *Adiantum*
- UNIT V:** Stellar evolution – Homospory, heterospory and seed habit, Apogamy and Apospory.

PRACTICALS:

A detailed study of structure and reproductive structures of types given in the syllabus and submission of record

A field trip to be undertaken to study the morphology of the plants its natural surroundings.

Recommended Text books

1. S.N.Pandey and P.S.Trivedi 2009. A Text book of botany Vol-I, Vikas Publishing House Pvt. Ltd.
2. S.N.Pandey Misra S P and P.S.Trivedi 2011. A Text book of botany Vol-II, Vikas Publishing House Pvt. Ltd.
5. Parihar, N.S. 1967. An introduction to Embryophyta Vol.I & II.

General Book Dept.

6. Bryophyta (Tamil Book) by Chandrasekar

7. Pteridophyta by Sivaramakrishnan, Tamilnadu paada nool niruvanam.

Reference Books

1. Watson EV. 1974. The structure and life of Bryophytes. B.I Publications, New Delhi
2. Bierhost, D.N. 1971. Morphology of vascular plant. MacMillan Pub., New York.
3. B.R.Vashista, A.K.Sinha and Adarsh Kumar 2012. Botany for Degree Students Bryophyta, S.Chand & Company Ltd., New Delhi
4. Vashista.P.C, A.K Sinha and Anil kumar 2012. Botany for Degree Students Pteridophytes, S.Chand and Co., New Delhi.
5. Sporne K.R 1976. Morphology of Pteridophytes 4th Ed. B.I Publications, New Delhi
6. Smith. G.M. 1955, Cryptogamic Botany. Voll III. McGraw Hill
7. Parihar N.S. 1967. An introduction to Embryophyta Vol II. Pteridophyta. Central Book Depot, Allahabad

JOURNALS

1. Journal of Plant Science
2. Journal of Bryology

E – LEARNING RESOURCES

1. <http://www.bryophytes.plant.siu.edu/>
2. <http://www.en.wikipedia.org/wiki/Bryophyte>
3. <http://www.mobot.org/MOBOT/tropicos/most/bryolist.shtml>
4. <http://www.accessexcellence.org/RC/botany.php>
5. <http://en.wikipedia.org/wiki/Pteridophyte>

COURSE OUTCOMES

CO NO.	CO STATEMENT
1	Acquire a comprehensive account of classes of Bryophytes and Pteridophytes their phylogenetic relationships
2	Recognise the specific genera based on differences in the internal and reproductive structures of Bryophytes
3	Study and correlate the evolving characters among the plant groups studied.
4	Understand the structural and reproductive aspects of Pteridophytic genera.
5	Study the economic importance of plant genera studied

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2
CO2	2	3	3	2	2
CO3	3	2	2	2	2

CO4	1	3	3	2	1
CO5	1	1	1	1	3
AVERAGE	2	2.4	2.2	2.2	2

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SEMESTER - II
CORE PAPER IV - PRACTICAL – II
BRYOPHYTES & PTERIDOPHYTES**

Practical Hours: 6 hours

Credit:4

PRACTICALS

COURSE OBJECTIVES

- To enable students to spot identify and classify the different forms of Bryophytes and Pteridophytes studied.
- To make sections and neatly display in microscopic slides showing minute details of their internal structure.
- To discuss economic the important forms in Bryophytes and Pteridophytes.

KEY

1. SECTIONING

A– BRYOPHYTES *Marchantia* Thallus T.S, *Funaria* Axis T.S

B– PTERIDOPHYTES *Lycopodium* stem T.S , *Equisetum* stem T.S ,
Adiantum rachis T.S

2. SLIDES

- C -** *Marchantiathallus* T.S, Antheridium & Archegonium V.S,
Sporophyte L.S *Anthocerothallus* T.S , Antheridium V.S ,
Archegonium V.S , Sporophyte L.S, *Funaria* axis T.S ,
sAntheridial head V.S ,Archegonial head V. S , Capsule L.S.
- D-** *Lycopodium* stem T.S , Strobilus L.S,
Equisetum stem T.S , Cone L.S
Adiantum rachis T.S, Sorus V.S

3. SPOTTERS

E & F -BRYOPHYTES *Marchantia* gametophyte, *Anthoceros* gametophyte , *Funaria* gametophyte with sporophyte

G & H-PTERIDOPHYTES *Lycopodium* Sporophyte (*L. cernum*, *L. clavatum*, *L. phlegmaria*), *Equisetum* sporophyte , *Adiantum* sporophyte

4. Pictures of protostele/ siphonostele, heterospory, Apogamy, Apospory

5.

6. **ECONOMIC IMPORTANCE**

J – Bryophytes- Peat, Medicinal use (three genera), Pollution indicators (three genera)

K– Pteridophytes- *Azolla*, Medicinal use (three genera), Food (three genera)

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
1	Identify by sectioning the plant materials
2	Study the internal structure of the Bryophytes and Pteridophytes
3	Identify and spot the specified plants based on morphological characterization
4	To know about stelar variations
5	Understand the economic importance of the selected plants.

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER – II
CORE PAPER – IV
PRACTICAL II**

Time:3 hours

MAXIMUM :75 MARKS
PRACTICAL :65 MARKS
RECORD :10 MARKS

1. Cut transverse section of A&B. Stain and mount in glycerine. Draw labeled diagrams. Identify giving reasons. Leave the slide for valuation.

A மற்றும் B யின் குறுக்கு வெட்டு எடுத்து கண்ணாடித்துண்டத்தில் மதிப்பீட்டிற்கு வை.
காரணங்களை கூறு. படம் வரைந்து பாகங்கள் குறி

(2x10=20
marks)

2. Draw diagram and write notes of interest on C and D. (2x8=16 marks)
C, மற்றும் D யில் உள்ளவைகளை பற்றி படத்துடன் குறிப்பு எழுது

3. Name the genus, group and morphology of the given part of E, F, G & H
கொடுக்கப்பட்ட E, F, G, H பகுதிகளின் புறத்தோற்றம், தொகுதி மற்றும் பேரினம் எழுதவும்.
(4x4=16 marks)
4. Comment on the spotter I
I யில் உள்ளவற்றை பற்றி குறிப்பு எழுது. (1x7=7marks)
5. Identify and write the notes on the economic importance of J&K
J, K யை கண்டறிந்து பொருளாதார முக்கியத்துவத்தினை பற்றி குறிப்பு எழுதவும்.
(2x 3 =6 marks)

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SEMSETER- II
CORE PAPER IV – PRACTICAL - II
MARKING SCHEME**

1. SECTIONING (2x10=20 marks)

- A - Bryophytes
B - Pteridophytes
(Systematic position& Identification- 2, Diagram – 2, Notes – 3; Slide -3)

2. SLIDES (2x8 =16 marks)

- C - Bryophytes
D - Pteridophytes

(Systematic position & Identification – 2, Diagram – 2, Notes –4)

3. SPOTTERS (4x4=16 marks)

- E - Bryophyte
- F - Bryophyte
- G - Pteridophyte
- H - Pteridophyte

(Genus – 1, Group – 1, Morphology – 2)

4. I - Pictures of protostele/ siphonostele, heterospory, Apogamy, Apospory
(1x7=7marks)

5. ECONOMIC IMPORTANCE (2x4 =8 marks)

- J - Bryophyte
- K- Pteridophyte

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER – III
CORE PAPER - V
GYMNOSPERMS, PALEOBOTANY & EVOLUTION**

Lecture Hrs : 6 Hrs

Credits:5

THEORY:

COURSE OBJECTIVES

- To provide a detailed account on higher plant forms as well as fossilized forms\

- To ascertain the importance of fossilization in order to relate life forms of earlier era
- To understand the fundamentals of evolution with the help of fossilized evidences

COURSE OUTLINE

- UNIT I** : Classification of Gymnosperms (K.R. Sporne 1962) - distribution of Gymnosperms – general characteristics & economic importance.
- UNIT II** : Comparative morphology, structure and reproduction of *Cycas*, *Pinus* and *Gnetum* (excluding developmental stages)
- UNIT III** : Geological time scale- era, period and epoch, types of fossils, Fossilization (impressions, compressions, casts, molds and petrification) radio carbon dating.
- UNIT IV** : Brief study of the following fossils 1. *Lepidodendron* 2. *Sphenophyllum* 3. *Lyginopteris* 4. *Williamsonia*
Contributions of Birbal Sahni in Palaeobotany
- UNIT V** : Evolution – origin of life, theories of evolution –Lamarck, DeVries and Darwin. Modern synthetic theory. Variation – adaptation and selection.

PRACTICALS:

1. A detailed study of vegetative and reproductive structure of types given in the syllabus, contributions of Birbal Sahni, Lamark, Darwin, Hugo Devries (photographs) and submission of record.
2. A visit to a palaeobotanical site to see the various fossils.

Textbooks:

1. S.N.Pandey, S.P.Misra and P.S.Trivedi 2011. A Text book of botany Vol- II, Vikas Publishing House Pvt. Ltd.
2. A.V.S.S.Sambamurthy 1998. A Text book of Botany Vol-II, Konark Publishers Pvt. Ltd
3. Vashista.P.C, A.K Sinha and Anil kumar 2013. Botany for Degree Students Gymnosperms, S.Chand and Co., New Delhi
4. Shukla A and Mishra S.P. 1982, Essentials ofPaleobotany, Vikas Publishing, House Pvt. Ltd.
- 5.S.R. Misra. 2010. Text Book on Palaeobotany, Discovery publishing Pvt. Ltd
6. Vidai mooda thavarangal (Tamil Book) by Chandrasekar

Reference Books:

1. Sporne K.R 1965. Morphology of Gymnosperms, B.I. Publications
2. Arnold C.A. 1947. Introduction to Paleobotany, McGraw Hill
3. Esau.K 1965. Vascular Differentiation in Plants.Holt, Rinehart and Winston, N.Y.
4. K.A.Siddiqui 2003. Elements of Paleobotany, KitabMahal, Allahabad
5. Peter George, 2008. Introduction to Paleobotany, Rajat Publications.

Journals:

1. Journal of Plant Research
2. International Journal of Current Research and Academic Review

Weblinks:

1. <http://en.wikipedia.org/wiki/Gymnosperm>
2. <http://www.gymnosperms.org/>
3. <http://www.hcs.osu.edu/hcs300/gymno.htm>
4. <http://www.geocities.com/heartland/plains/6761/ecycads>
5. <http://www.life.umd.edu/classroom/BSCI124/lec19>
6. <http://www.npwrc.usgs.gov/index.htm>
- en.wikipedia.org/wiki/Paleobotany
7. www.mineralogie.uni-wuerzburg.de/palbot1.html
8. www.colby.edu/~ragastal/Paleobot.htm---- (introduction to paleobotany)
9. www.ucmp.berkeley.edu/IB181/VPL/Dir.html -- (virtual paleobotany lab)

COURSE OUTCOME:

CO NUMBER	CO STATEMENT
1	Learn the outline classification of Gymnosperms
2	Compare the specific genera of Gymnosperms based on structural characters
3	Understand the importance of Palaeobotany and Fossilization
4	Get a detailed account on the evolution of life and their theories
5	Learn the commercial value of Gymnosperms

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	2
CO2	2	3	3	2	2
CO3	1	2	2	2	1
CO4	1	3	2	1	1
CO5	1	3	1	1	3
AVERAGE	1.6	2.8	1.8	1.4	1.8

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER – III**

CORE PAPER – VI PRACTICAL III

Practical Hours : 6 Hours

Credits:4

PRACTICALS

COURSE OBJECTIVES

- To provide a detailed account on higher plant forms as well as fossilized forms\
- To ascertain the importance of fossilization in order to relate life forms of earlier era
- To understand the fundamentals of evolution with the help of fossilized evidences

KEYS

1. SECTIONING MATERIAL (A,B,C)

- Cycas** – i) T S of Leaflet
 ii) T S of Corolloid Root
 iii) T S of Microsporophyll

2. SLIDES (D,E, F)

Cycas –

- i) Stem TS
 ii) Normal root TS
 iii) T S of Rachis

Pinus

- i) Stem TS
 ii) Root TS

3. SPOTTERS (ENTIRE- G, H, I)

Cycas

- i) Corolloid root
 ii) Male cone
 (iii) Female cone

Pinus

- i) Needle
 ii) Male cone
 iii) Female cone

Gnetum

- i) Male cone
 ii) Female cone

4. PALAEOBOTANY SLIDE

- i) *Sphenophyllum* .
 ii) *Lepidocarpon* .
 iii) *Williamsonia*

5. ECONOMIC IMPORTANCE- ANY TWO

- i) *Cycas* - Sago, Ornamental,
 Ovule (Edible)
 ii) *Pinus* – Turpentine, Cone
 (Ornamental), Timber

- Pinus** i) T S of Needle
Gnetum – i) T S of Leaf

- iv) T S of Leaflet
 v) Corolloid Root

Gnetum

- i) Stem TS
 ii) Root TS

- iv) Microsporophyll
 v) Megasporephyll with ovule

iii) *Gnetum* – Medicine (Rheumatism), Fiber/Paper, Rope/Fishing net, Edible seeds

6. **M** -Birbal Sahni, Lamark, Darwin,Hugo Devries (photographs)

COURSE OUTCOMES

CO No.	CO STATEMENT
1	Identify and place the specific plants to their respective taxonomic groups
2	Study the internal structure of the Bryophytes and Pteridophytes
3	Identify and spot the specified plants based on morphological characterization
4	Identify and spot the specified plants based on anatomical characterization
5	Understand the specific importance of the selected plants.

SYLLABUS Effective from 2017-2018
SEMESTER – III
CORE PAPER – VI
PRACTICAL III

Time:3 hours

MAXIMUM : 75 MARKS
PRACTICAL : 65 MARKS
RECORD :10 MARKS

1. Cut transverse section of A ,B& C. Stain and mount in glycerin. Draw labeled diagrams. Identify giving reasons. Leave the slide for valuation

A, B மற்றும் Cயின் குறுக்கு வெட்டு எடுத்து கண்ணாடித்துண்டத்தில்
மதிப்பீட்டிற்கு வை. காரணங்களை கூறு. படம் வரைந்து பாகங்கள் குறி

(3x 8= 16 marks)

2. Draw diagram and write notes of interest on D, E, F

D, E மற்றும் Fயில் உள்ளவைகளை பற்றி படத்துடன் குறிப்பு எழுது

(3x5=15 marks)

3. Name the genus, group and morphology of the given part of G , H, I

கொடுக்கப்பட்ட G, H, I பகுதிகளின் புறத்தோற்றம், தொகுதி மற்றும் பேரினம் எழுதவும்.

(3x3=9 marks)

4. Comment on the spotter J and refer to their geological era

J யில் உள்ளவற்றின் புவியியல் காலம் மற்றும் குறிப்புகளை எழுதுக.

(1x6 = 6 marks)

5. Identify and write the notes on the economic importance of K & L

K & L யை கண்டறிந்து பொருளாதார முக்கியத்துவத்தினை பற்றி குறிப்பு எழுதவும்

(2x3 = 6marks)

6. Identify the photograph M. and write his contributions. (1x3 =3 marks)

M யை கண்டறிந்து குறிப்புகளை எழுதுக.

MARKING PATTERN

1. SECTIONING (3x 8= 24 marks)

- A - CYCAS
- B - PINUS
- C - GNETUM

(Slide – 2, Identification – 1, Diagram – 2, Reason – 3)

2. SLIDES (3x 5= 15marks)

- D - CYCAS
- E - PINUS
- F - GNETUM

(Identification – 1, Classification – 1, Diagram – 1, Reason – 2)

3. SPOTTER (ENTIRE) (3x 3= 9marks)

- G - CYCAS
- H - PINUS
- I - GNETUM

(Genus – 1, Group - 1, Morphology - 1)

4. PALAEOBOTANY SLIDE (1X5=5 marks)

- J - FOSSIL SLIDE

(Identification -1, Geological era – 1, Diagram – 1, Notes-2)

5. ECONOMIC IMPORTANCE (2X3=6 marks)

- K - CYCAS
- L - PINUS, GNETUM

(Identification – 1, Notes – 1)

6. M - Birbal Sahni, Lamark, Darwin, Hugo Devries (photographs)

(Identification – 1, Notes – 1)

(1x3 =3 marks)

ALLIED PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

Lecture Hrs : 6 Hours

Credits: 5

THEORY:

COURSE OBJECTIVES

- To introduce the various topics related to Botanical Studies to the students of Zoology and Chemistry.
- To enable detailed studies of specific algal and fungal genera
- To enable detailed studies of specific Bryophyte, Pteridophyte and Gymnosperm genera

COURSE OUTLINE

- UNIT I** : Cell Biology : Prokaryotic and Eukaryotic cell (Plant cell) cell.
- UNIT II** : Organelles – structure and function of chloroplast, mitochondria and nucleus.
- UNIT III** : Anatomy : Tissues – Simple and permanent tissues. Primary structure of dicot stem and dicot root. Primary structure of monocot root and stem- dicot leaf.
- UNIT IV** : Structure and Life History of (excluding developmental studies)
a. *Nostoc*,
b. *Albugo*.
- UNIT V** : Structure and life History of (excluding developmental studies)
a. *Riccia*, b. *Lycopodium* c. *Cycas*.

PRACTICALS:

1. To make suitable slide -preparations, describe and identify materials of Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms given in the syllabus and submission of record.
2. Study of internal structure of young and old stem of dicotyledons, young dicot root and monocot root.
3. Study of internal structure of dicot leaf.

Recommended Text Books

1. Ganguly A.K. and Kumar N.C. Emkay. General Botany – Vol I & II.
2. S.N.Pandy and P.S.Trivedi 2009. A Text book of botany Vol-I, Vikas Publishing House Pvt. Ltd.
3. Botany Allied Text Book by Shaik Khaja Rasool
4. Thaavaraviyal thunai paatam by P.Rajaram, kalloori nool velieettu eyakkunarakam

Reference Books:

1. Verma P.S and Agarwal V.K 1980, Cytology, S.Chand& Co Limited.
2. B.R.Vashista, A.K.Sinha, V.P.Singh 2012. Botany for Degree Students Algae, S.Chand& Company Ltd., New Delhi.

3. Pandey B.P 2010. Plant Anatomy, S.Chand& Co.
4. .B.R.Vashista, A.K.SinhaandAdarsh Kumar 2012. Botany for Degree Students Bryophyta, S.Chand& Company Ltd., New Delhi
5. .Vashista.P.C, A.K Sinha and Anil kumar 2012. Botany for Degree Students Pteridophytes, S.Chand and Co., New Delhi.
6. Vashista.P.C, A.K Sinha and Anil kumar 2013. Botany for Degree Students Gymnosperms, S.Chand and Co., New Delhi.
7. GeetaSumbali 2012 The Fungi. Satya book house.

JOURNALS

1. Journal of Algae
2. International Journal of Cell biology

E – LEARNING RESOURCES

- 1.www.science direct
- 2.www.biologydiscussion.com
- 3.www.saraspublication.com
- 4.<https://www.genetics.org>
- 5.www.quora.com

COURSE OUTCOME

CO NUMBER	CO STATEMENT
1	Get a thorough knowledge on Cell organisation
2	Understand about structure and functions of cell organelles
3	Acquire knowledge on the internal structures of various groups of plants
4	Obtain a preliminary knowledge about algae and fungi
5	Type Study of bryophytes, pteridophytes and gymnosperms

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO4	PSO5
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
AVERAGE	3	3	3	3	3	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**B.Sc DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS EFFECTIVE FROM 2017-2018
SEMESTER – III and IV
ENVIRONMENTAL STUDIES**

SUBJECT CODE - 174001

CREDITS: 2

COURSE OBJECTIVES

- To teach the students the importance of renewable and non renewable resources
- To enable the students to understand about biodiversity conservation and social issues
- To impart knowledge about the various ecosystems in the biome, population and environment

COURSE OUTLINE

UNIT - 1 : The multi disciplinary nature of environmental studies :

Definition , scope and importance . Need for awareness .

UNIT - 2 : Natural resources : Renewable and non renewable resources :

Natural resources and associate problems :

a . Forest resources : use and over exploitation , deforestation , case studies. Timber extraction mining , dams and there effects on forest and tribal people .

b . Water resources : use and over utilization of surface and ground water , flood, drought, conflicts over water , dams – benefits and problems .

c. Mineral resources : use and exploitation , environmental effects of extraction and using mineral resources, , case studies .

d. Food Resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer – pesticide problems, water logging , salinity , case studies .

e. Energy resources : Growing energy needs , renewable and non renewable energy sources, use of alternate energy sources, case studies .

f. Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification .

Role of an individual in conservation of natural resources.
equitable use of resources for sustainable lifestyles.

UNIT -3 : Ecosystem : Concept of an ecosystem – structure and function of an ecosystem – procedures , consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains , food webs and ecological pyramids – introduction, types, characteristics features, structure and function of the following ecosystem :

a. Forest ecosystem

b. Grassland ecosystem

c. Desert ecosystem

d. Aquatic ecosystem (ponds , streams , lakes, rivers , oceans, estuaries).

UNIT – 4 : Biodiversity and its conservation

a. Introduction – definition : genetic, species and ecosystem diversity

b. Biological classification of India.

c. Value of biodiversity : consumptive use. productive use , social, ethical, aesthetic and option values.

d. Biodiversity a global , National and local level.

e. India as a mega – diversity nation .

f. Hot – spots of biodiversity.

g. threats to biodiversity : habit loss, poaching of wildlife, man wildlife conflicts.

h. Endangered and endemic species of India .

i. conservation of biodiversity : in-situ and EX-situ conservation of biodiversity.

UNIT -5 : Environmental pollution : Definition

1. causes, effects and control measures of

a. Air pollution

b. Water pollution

c. Soil pollution

d. Marine pollution

e. Noise pollution

- f. thermal pollution
- g. Nuclear pollution
- 2. Solid waste management : Causes, effects and control measures of urban and industrial water.
- 3. Role of an individual in prevention of pollution.
- 4. Pollution case studies
- 5. Disaster management : floods , earthquake , cyclone and landslides.

UNIT – 6 : Social issues and the environment

- 1. From unsustainable to sustainable development
- 2. Urban problems related to energy
- 3. Water conservation , rain water harvesting , watershed management
- 4. Resettlement and rehabilitation of people ; its problems and concerns. case studies
- 5. Environmental ethics : issues and possible solutions
- 6. climatic change , global warming , acid rain, ozone layer depletion , nuclear accidents, and holocaust. case studies .
- 7. Waste land reclamation
- 8. Consumption and waste products
- 9 . Air (prevention and control of pollution) act
- 10. Water (prevention and control of pollution) act
- 11. Wildlife protection act
- 12. Forest conservation Act
- 13. Issues involved in enforcement of environmental legislation
- 14. Public awareness

UNIT – 7 : Human population and the environment

- 1. Population growth , variation among nations
- 2. Population explosion – family welfare programs
- 3. Environment human health
- 4. Human rights
- 5. Value education
- 6. HIV / AIDS
- 7. Women and child welfare
- 8. Role of information technology in environment and human health
- 9. Case studies

UNIT -8 : Field work:

- 1. Visit to a local area to document environmental assets- river/ forest/ grassland/hill/mountain
 - 2. visit to a local polluted site – urban/ rural/ industrial/ agricultural
 - 3. study of common plants , insects, birds
- study of simple ecosystem – pond , river, hill slopes , etc
(field work equal to 5 lecture hours)

Text Books:

- 1. A Textbook in Environmental Science by V. Subramanian:
Narosa Publications
- 2. Sutrusoozhal ariviyal (Tamil book) by Chandrasekaran

Reference Books:

- 1.. Sharma P.D. 1993. Environmental Biology and Toxicology Rastogi& Co., Meerut
- 2. Global Environmental Change by Jonathan Graves, Longmann\
- 3. Fundamental Concepts in Environmental studies by D. D. Mishra, Chand Publications
- 4. Fundamentals of Environmental studies by Sarita Kumar, Sultan Chand Publications
- 5 Environmental Resources by A. S Mather , Longman.

Journals

- 1.Environmental Biology

2. Indian Hydrobiology

3.Science

E – LEARNING RESOURCES

1. www.evs.anl.gov.
2. <https://www.kilian.com>
3. <https://www.nationalgeographic.org>
4. <https://www.livescience.com>
5. <https://www.ncbi.nlm.nih.gov>

COURSE OUTCOME

CO NUMBER	CO STATEMENT
1	Get a thorough knowledge on different natural resources
2	Understand the various ecosystems with examples
3	Acquire knowledge on Biodiversity and its conservation
4	Obtain a detailed account on environment and health
5	Get a hands on experience on maintaining a garden ecosystem

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO4	PSO5
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
AVERAGE	3	3	3	3	3	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER – IV
CORE PAPER – VII
CELL BIOLOGY, ANATOMY & EMBRYOLOGY

Lecture Hrs : 6 Hrs

Credits:5

THEORY:

COURSE OBJECTIVES

- To enhance the fundamental knowledge about living cells and their systematic up-gradation in to the tissue level.
- To study the differentiation features of internal structure of the plant body.
- To obtain a thorough knowledge about the cell cycle in higher plants

COURSE OUTLINE

UNIT I : Prokaryotic (bacterial cell) and eukaryotic cell (plant cell), cell wall –composition, structure, chemistry and function. . Plasma membrane- structure and model (Fluid Mosaic) cytoplasm – living and non- living inclusions.

- UNIT II** : Occurrence, structure and functions of endoplasmic reticulum. Golgi bodies, lysosomes, ribosomes, mitochondria, chloroplast and nucleus. Chromosomes – structure, euchromatin, heterochromatin, stages in cell cycle and cell division- Mitosis and Meiosis.
- UNIT III** : Tissues –definition, types- simple- parenchyma, collenchyma and sclerenchyma (fibers and sclereids). Complex tissue – xylem and phloem. Meristems - classification. Theories of shoot and root apex (apical cell, histogen, tunica corpus)
- UNIT IV** : Tissue systems – Dermal tissue system- fundamental or ground tissue system. Vascular tissue system and types of vascular bundles – vascular cambium. Primary structure of stem, root and leaf in dicotyledons and monocotyledons, secondary structure of stem and root in dicot plants
- UNIT V** : Structure of anther and male gametophyte. Structure and types of ovule. Structure of female gametophyte. Types of Embryo sac-(Monosporic, bisporic and tetrasporic). Fertilization – double fertilization syngamy, triple fusion. Endosperm – types (nuclear, cellular, helobial) ruminant endosperm – function of endosperm, structure and development of mature dicot embryo (Capsella). Apomixis and Polyembryony

PRACTICALS:

1. Study of structure of plant cell organelles from electron micrographs
2. Study of internal structure of young and old stem and root of Dicotyledons
3. Study of internal structure of normal stem and root of monocotyledons.
4. Study of internal structure of Dicot and Monocot leaves.
5. Dicot embryo study using Tridax embryo
6. Study of mitosis by squash technique
7. A visit to a lab for visualizing ultra-microtome sectioning of plant materials.

Recommended Text Books

1. N.Arumugam 2014. Cell Biology, Saras Publication.
2. Verma P.S and Agarwal V.K 1980, Cytology, S.Chand & Co Limited
3. Annie.Ragland 2010. Plant Anatomy and Microtechniques, Saras Publications
4. Pandey B.P 2010. Plant Anatomy, S.Chand & Co
5. Taavara Ullamaipyal (Tamil Book) by Chandrasekar

Reference Books

1. Cohn N.S 1979, Elements of Cytology, Freeman Book Co.
2. Hell J.I, Flowers T.J and Roberts R.M 1978, Plant cell structure and metabolism. Longman
3. Eames A.J and Mac Daniels L.H 1972, Introduction to Plant Anatomy, Tata McGraw Hill
4. Maheswari. P, 1971. An Introduction to the embryology of Angiosperms. Tata McGraw Hill
5. Tayal M.S 1979, Plant Anatomy, Rastogi Publications

Journals:

1. Frontiers in Plant Science
2. Journal of Morphology and Anatomy

Web Links:

1. <http://www.en.wikipedia.org/wiki/Cellbiology>
2. http://www.biology.arizona.edu/CELL_BIO/cell_bio
3. <http://www.cellbio.com/>
4. <http://www.stumbleupon.com/tag/plant-anatomy>.
5. <http://www.mnstate.edu/weibust/internetresbiostu>.

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
1	Understand the Classification of cell and tissue types
2	Get a thorough knowledge on Ultra-structure of a living cell and its organelles
3	Acquire knowledge on the tissue levels of organisation in plants
4	Learn the structural and functional aspects of reproduction in plants
5	Differentiate the various plant embryo types studied.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	3
CO2	2	3	2	3	2
CO3	2	3	3	3	2
CO4	2	3	3	3	2
CO5	3	2	3	2	1
AVERAGE	2.4	2.8	2.6	2.4	2

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER – IV
CORE PAPER –VIII, PRACTICAL IV
CELL BIOLOGY, ANATOMY & EMBRYOLOGY**

Practical Hours : 6 Hours

Credits:4

PRACTICALS

COURSE OBJECTIVES

- To identify and differentiate the plant forms by anatomical studies
- To know the stages of cell division and embryo
- To find out the cell organelles, tissue types, ovule types and embryo stages

KEYS

SECTIONING – A& B

- i) T.S – Dicot Stem (*Tridax*, *Fernonia*)
- ii) T.S – Monocot Stem (*Setaria*, *Cyanodon*)
- iii) T.S – Dicot Root (Sprouts of green gram / *Cicer* (young root))
- iv) T.S-Monocot Root (*Canna*)

- v) T.S – Dicot Leaf (*Mangifera*, *Tridax*)
vi) T.S – Monocot Leaf (*Setaria*)

C- ONION ROOT TIP

D- TRIDAX INFLORESCENCE

E, F, – MICROPHOTOGRAPHS (CELL BIOLOGY)

i) Plant Cell	iv) Golgi Apparatus
ii) Mitochondria	v) Endoplasmic Reticulum
iii) Chloroplast	vi) Nucleus

G – ANY ONE PROPHASE-I SUB STAGES (zygotene, pachytene, diakinesis)

H & I- ANATOMY SLIDES

i) Collenchyma	iii) Different stele types
ii) Sclerenchyma (sclereids)	iv) Sec. structure of dicot stem & root

J & K- EMBRYOLOGY SLIDES

T S of Mature Anther

Orthotropous Ovule

Anatropous Ovule

Campylotropous Ovule,

Embryo Two Celled Stage,

Embryo Four Celled Stage,

Embryo Eight Celled Stage,

Dicot embryo (Capsella)

Endosperm-Cellular, Nuclear, Helobial

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
1	Understand the types of cell and tissue types
2	Get a thorough knowledge on cell and organelles
3	Understand the the stages of cell division and embryo
4	Learn the structural variations of ovule and embryo in plants
5	Differentiate the various plant tissue types studied.

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER – IV
CORE PAPER – VIII, PRACTICAL IV (CORE VII)
(CELL BIOLOGY, ANATOMY & EMBRYOLOGY)**

Time:3 hours

MAXIMUM : 75 MARKS
PRACTICAL : 65 MARKS
RECORD :10 MARKS

1.Cut transverse section of A,B. Stain and mount in glycerine. Draw labeled diagrams. Identify giving reasons, leave the slide for valuation.

A,B, யின் குறுக்கு வெட்டு எடுத்து கண்ணாடித்துண்டத்தில்

மதிப்பீட்டிற்கு வை. காரணங்களை கூறு. படம் வரைந்து பாகங்கள் குறி.

(2x10=20 marks)

2. Make acetocarmine preparation of C. Show any one dividing stage and draw labeled sketch. Leave the slide for valuation. Write notes.

C யினை அசிடோகார்ம்மைன் கொண்டு தயார் செய். செல் பிரிதல் நிலையை மதிப்பீட்டிற்கு வை. படத்துடன் குறிப்புகள் எழுதுக. (1x 8= 8 marks)

3. Disect the given material D and Mount any one stage of developing embryo. Draw labeled sketch. Leave the preparation for valuation.

D ன் கரு வளர்நிலையினை தயார் செய்து மதிப்பீட்டிற்கு வை. படம் வரைந்து பாகங்கள் குறி.

(1x6=6 marks)

4. Identify and comment on E, F

E, F யினை அடையாளம் காண். குறிப்புகள் எழுதுக. படங்கள் வரைந்து பாகங்கள் குறி. (2x5=10 marks)

5. Identify and comment on G

G யில் உள்ளதை கண்டறிந்து குறிப்பு எழுது.

(1X5=5 marks)

6. Identify and write notes on H, I, J, K

H, I, J, மற்றும் K இல் கொடுக்கப்பட்டுள்ள மாதிரிகளை அடையாளம் கண்டு, குறிப்பு எழுதுக. (4x4=16 marks)

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018**

**SEMESTER – IV
CORE PAPER – VIII , PRACTICAL IV (CORE VII)
CELL BIOLOGY, ANATOMY & EMBRYOLOGY**

MARKING SCHEME

1. A, B – ANATOMY

(2x10=20 marks)

(Identification – 1, slide- 3, diagram – 2, notes- 4)

2. C – CELL BIOLOGY (ROOT TIP-SQUASH)

(1x 8= 8 marks)

(Identification of one stage-1, slide showing two stages – 3, diagram – 2, notes-2)

3. D – EMBRYO (TRIDAX)

(1x6=6 marks)

(Identification – 1, Slide -3, diagram & notes-2)

4. E, F, - MICROPHOTOGRAPHS (CELL BIOLOGY) (2x5=10 marks)

(Identification 1, diagram -2, notes -2)

5. G – MEIOSIS-I (PROPHASE - I SUB STAGES) (1X5=5 marks)

(Identification – 1, diagram -2, notes – 3)

6. H, I, J & K ANATOMY & EMBRYOLOGY SLIDE MOUNT (4x4=16 marks)

(Identification -1, diagram – 1, notes-2)

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER –IV
ALLIED PAPER – II**

ALLIED PLANT BIOLOGY AND PLANT BIOTECHNOLOGY

Lecture Hrs :6Hrs

Credits: 5

THEORY:

COURSE OBJECTIVES:

- To introduce the various topics related to Botanical Studies to the students of Zoology and Chemistry.
- To enable detailed studies on specific angiospermic plants
- To enable study of basic facts on embryology, physiology and genetics

COURSE OUTLINE

UNIT I : Taxonomy& taxonomic hierarchy. Binomial nomenclature, ICBN. General outline of Bentham and Hooker's system of Classification.

UNIT II :

Study of the range of characters and plants of economic importance in the following families. Anonaceae, Fabaceae (Papillonoideae), Rubiaceae, Euphorbiaceae and Liliaceae.

- UNIT III** : Embryology : Structure of mature anther. Structure of mature ovule its types – Fertilization.
- UNIT IV** : Plant Physiology : Absorption of water, Photosynthesis – Light reaction – Calvin cycle, Respiration – Aerobic & Anaerobic- Glycolysis, Kreb's Cycle.
- UNIT V** : Genetics :Mendelism, Mendel's laws, monohybrid and dihybrid crosses. Test cross and Back cross.

PRACTICALS:

1. To describe the technical terms, plants belonging to any of the families prescribed and to identify the family.
2. To dissect a flower, construct floral diagram and write floral formula.
3. To describe simple experimental set up in plant physiology section of the syllabus.
4. Observation of permanent slides of embryology with relevant to the syllabus.

RECOMMENDED TEXT BOOKS:

1. Ganguly A.K. and Kumar N.C. Emkay. General Botany – Vol I & II,.
2. Pandey, H.P. 2011 Plant Taxonomy, Silverline Publications, New Delhi.
3. Taavaraviyal thunaippaadam (Tamil Book) by Shaik Khaja Rasool

REFERENCE BOOKS:

1. Ashok Bendre and Pande. Introductory Botany, P.C. Rastogi Publications, Meerut.
2. Dr.S.K.Verma and MohitVerma 2014. A textbook of Plant Physiology, Biochemistry and Biotechnology. S.Chand and Co publications
3. S.P.Misra2011 . Evolution, Ecology, Cell Biology & Genetics. Silver line Publisher
- 4.Arumugam 2010. A Text book of Embryology, Saras Publication.
- 5.Miglani G. S. 2000. Basic Genetics,Narosa Publishing House, New Delhi.

Journals

1. Journal of Plant Sciences
2. Indian Journal of Current Sciences

Weblinks

1. <http://www.botany.com>
2. <http://glossary.gardenweb.com/glossary>
3. <http://dallas.tamu.edu/weeds/anat.html>
4. <http://atlasveg.ib.usp.br/English/focara.html>
5. <http://www.rrz.uni-hamburg.de/biologie/b-online/e04/04.htm>
6. <http://home.teleport.com/~amobb/biology/botany.html>

COURSE OUTCOME

CO NUMBER	CO STATEMENT
1	Get a thorough knowledge on different plant tissues
2	Understand the taxonomic characters of mentioned families and their economic importance
3	Acquire knowledge on anther and ovules
4	Obtain a detailed account on photosynthesis and respiration
5	A study on mendelian genetics

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	2
CO2	3	3	2	3	3
CO3	3	2	3	2	1
CO4	3	2	3	3	1
CO5	1	1	1	3	1
AVERAGE	2.6	2.2	2.4	2.6	1.6

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
ALLIED PRACTICALS**

Practical Hours : 6 Hours

Credits:4

PRACTICALS**COURSE OBJECTIVES**

- To enable students to have hands on experience on study on entire specimen and their internal structure by way of sectioning.
- To enable students to classify the higher plants based on their taxonomical characters

KEY**A - FAMILY**

Annonaceae – *Polyalthia*

Euphorbiaceae – *Riccinus*

Fabaceae – *Pongamia, Clitoria*

Liliaceae – *Allium*

B – FAMILY

Annonaceae – *Annona*

Euphorbiaceae – *Euphorbia*

Liliaceae – *Asparagus*

Rubiaceae – *Ixora*

Fabaceae – *Crotalaria*

C – ANATOMY

Dicot Root

Dicot Stem

Dicot Leaf

Monocot Stem

Monocot Root

D – CRYPTOGRAMS

Fungi

- *Albugo* infected Leaf

Bryophyta

- *Riccia* Thallus

Pteridophyta

- *Lycopodium* Stem

Gymnosperms

- *Cycas*-Rachis, Leaflet, Coralloid Root

E, F, G –CRYPTOGAMS

E -CRYPTOGAMS

Nostoc –slide

Lycopodium Stem T.S, Strobilus

Albugo conidia stage - slide

Cycas – Microsporophyll and Megasporophyll

Riccia– Thallus T.S. slide

– Entire

H –EMBRYOLOGY

Anatropous Ovule – V.S

Orthotropous Ovule – V.S

Anther T.S

I –CYTOLOGY – Photomicrographs

Chloroplast

Plant Cell

Mitochondria

Bacterial Cell

Nucleus

J –PHYSIOLOGY SET UP

Test tube Funnel experiment

Thistle funnel experiment

Ganong's Light Screen Experiment

Respiroscope

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
1	Understand the plant family characters
2	Get a thorough knowledge on anatomy
3	Understand the the stages of cell division and embryo
4	Learn the structural variations of cell organelles and ovules in plants
5	To test the plant functions.

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017 - 2018**

ALLIED PLANT BIOLOGY AND PLANT BIOTECHNOLOGY PRACTICALS**Time: Three hours****Maximum : 75 marks****Practicals : 65marks**

Record : 10 marks.

1. Refer A to its respective family giving reasons
(diagrams not necessary)

A தாவரம்எந்தகுடும்பத்தைச்சார்ந்ததுஎன்பதைத்தக்ககாரணங்களுடன்எழுதுக.
(படங்கள்தேவையில்லை)(1x6=6Marks)

2. Describe B in technical terms. Draw diagrams of the L.S. of flower and the T.S. of ovary

B ஐ கலைச்சொற்களால்விவரி,
மலரின்நீள்வெட்டுத்தோற்றம்மற்றும்சூற்பையின்குறுக்குவெட்டுத்தோற்றம்ஆகியவற்றை
மட்டும்வரைக.
(1x7=7Marks)

3. Cut transverse section of C. Stain and mount in glycerine. Identify giving reasons. Draw diagrams and submit the slide for valuation.

C யின்குறுக்குவெட்டைஎடுத்து, வண்ணமிட்டு,
கிளிசரினில்வைத்துஸ்ஸைடில்ஏற்றவும்.தக்ககாரணங்களுடன்அதுஎன்னவென்றுகண்டு
பிடிக்கவும். படம்வரைக, ஸ்ஸைடைமதிப்பீட்டிற்குத்தருக. (1x8=8Marks)

4. Make micropreparation of D. Stain and mount in glycerine. Identify giving reasons. Draw diagrams. Submit the slide for valuation.

D யின்தக்கநுண்தயாரிப்பைதயாரிக்கவும்.அதைவண்ணமிட்டு,
கிளிசரினில்வைத்துஸ்ஸைடில்ஏற்றவும்.
தக்ககாரணங்களுடன்அதுஎன்னவென்றுகண்டுபிடிக்கவும். படம்வரைக.
ஸ்ஸைடைமதிப்பீட்டிற்குத்தருக.
(1x8= 8Marks)

5. Write critical notes on E, F, G, H & I. Draw diagrams

E, F, G, H, மற்றும் I ஆகியவற்றைப்பற்றிஎழுதுக. படங்கள் வரைக
(5x6=30Marks)

6. Comment on the set up J

J யின்அமைப்பைப்பற்றிஎழுதுக.(1x6=6Marks)

B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
ALLIED PRACTICALS
(For the use of the examiners)

1. A- Family identification with reasons
(Identification -2, Reasons -4) (1x6=6Marks)
2. B – Technical description of the plant
(Description -5, L.S. of flower -1 and T.S. of ovary-1) (1x7=7Marks)
3. C- Anatomy

- (Identificaion -1, Notes -2, Diagram -2, Slide -3) (1x 8= 8Marks)
4. D –Cryptogams
(Identification -1, Notes- 2,Diagram-2, Slide-3) (1x 8= 8Marks)
5. E, F, G, H & I
Cryptogams (3), Embryology (1), Cytology (1)
(Identification -1, Notes-3, Diagram -2) (5x6=30Marks)
6. J –Physiology set up
(Comment – 4, Diagram -2) (1x6=6Marks)

II B.Sc. SEMESTER – III

Title : **SOFT SKILLS PAPER – III**
Personality Enrichment
 Subject Code : Credits:2
 : 2Hours

Unit I: Determinants of Personality and Personality Traits

- Definition of ‘Personality’
- Determinants of Personality
- Personality Traits
- Big Five Personality Traits
- Related Activities

Unit II: Understanding Self: The Johari - Window

- Introduction

- Johari-Window
- Changing the Quadrants
- Related Activities

Unit III: Coping with Self Liabilities

- Common liabilities and coping with these liabilities
 - Anger
 - Shyness
 - Conflicts
- Related Activities

Unit IV: Self-Discipline

- Introduction
- Key ingredients of Self-discipline
- Conclusion
- Related Activities

Unit V: Personality Manifestation

- Non-verbal communication: a powerful tool
- Types of non-verbal communication and body language
- Psychologically proven examples of body language
- Using body language and non-verbal communication successfully.
- Do's and Don'ts of body language
- Related Activities

Books for Reference:

1. Aurther John, *Personality Development*, Lotus Press, New Delhi, 2006.
2. Karstein, H. *Positive Thinking for Positive Living*, Focus Books, Popular Prakashan, Mumbai, 1986.
3. Khera Shiv. *You Can Win. A Step by Step Tool for Top Achievers*, Macmillan, Chennai, 1998.
4. Newstrom John W. and Edward E. Scannell, *Games Trainers Play, Experiential Learning Exercises*, Tata McGraw-Hill, New Delhi, 1980.
5. Newstrom John W. and Edward E. Scannell, *More Games Trainers Play*, Tata McGraw-Hill, New Delhi, 1980.
6. http://en.wikipedia.org/wiki/body_language.
7. <http://www.deltabravo.net/custody/body.php>.

II B.Sc. SEMESTER - IV

Title : **SOFT SKILLS PAPER – IV**
Basic Computer Skills & Applications

Subject code : 129004

Credits : 2

Unit I: Computer Fundamentals

- Computer Basics: Computer Hardware, Computer Software, System Software, Application Software, Utility Software, single User OS, Multi User OS

Unit II: Computer Environment

- Computer Peripherals: Input Devices, Output Devices, Secondary Storage, Windows
- Operating System: Introduction, Features, Desktop, Windows Explorer, Organizing Files and Folders – Build-in- Applications.

Unit III: MS-Word

- Creating a document, Entering text, Opening, Saving and Closing Documents, Inserting, Moving, Copying text, Search and Replacing Text, Paragraph Format, Spell Check, Page Views, Page Formats, Special Formats and Page layouts, Working with tables, Printing documents.

Unit IV: MS-Excel

- Introduction: worksheet, Cell, Range, Data Entry, Formulae Creation, Fill Command, Insertion, Deletion, Cell Row, Column, Inserting Pictures, Special Characters Objects, Charting and Mapping, Printing worksheets.

Unit V: MS-Powerpoint

- Overview: Slides, Speaker Notes, Charts, Graphs, Clipart, Editing Text, Animation, Art and Sound, Slide Show, Slide Sorter.

Text Book

1. Computer Application in Business and Management – AnanthiSheshasaayee and Sheshasaayee, Margham Publications.
2. Mastering Microsoft Office Professional for Windows Lonnie. Moseley, David M Boodey – BPB Publications.
 1. MS – Dos and Windows User Guide (Chapter 3).
 2. MS – Office Professional instant reference – Dienes.
 3. The Compact Guide to MS-Office-Mansfield.

B.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY SYLLABUS Effective from 2017-2018

SEMESTER– V

CORE PAPER - IX

GENETICS, PLANT BREEDING AND BIOSTATISTICS

Lecture Hrs : 6 Hrs

Credits:5

THEORY:

COURSE OBJECTIVES

- To impart theoretical knowledge on the fundamentals of genetics (Mendelian and Non-Mendelian) as well as Molecular genetics
- To teach the various traditional and modern aspects of plant breeding techniques in practice.
- To master the quantitative assessment methodologies adopted in Biological

COURSE OUTLINE

UNIT I

Mendelian Genetics: Mendel's Laws - monohybrid and Di-hybrid cross– Back cross- test cross. Interaction of genes - Incomplete dominance complementary genes, supplementary genes, epistasis, duplicate genes.

- UNIT II** : Chromosome theory of Linkage and crossing over. Chromosome mapping, Sex determination in plants, Sex linked inheritance – Haemophilia and colour blindness. Extra nuclear inheritance in plants – chloroplast – mitochondria.
- UNIT III** : Principles involved in plant breeding and its importance in green revolution with reference to wheat and rice. Methods of crop improvement: selection (pure line, mass and clonal), hybridization, introduction and acclimatization.
- UNIT IV** : Polyploidy and its application in plant breeding. Breeding for disease resistance – Mutation breeding. Transgenic crops in crop improvement. Heterosis-causes and effects.
- UNIT V** : Biostatistics- importance. Data and its types – measures of central tendency. Representation of data (histogram, Line graph, Bar graph, Pie chart. Mean, Median Mode, Standard Deviation. Standard error. Tests of significance – ‘t’ test.

PRACTICALS:

1. Simple problems on monohybrid, Dihybrid ratio, interaction of factors and Biostatistics
2. Demonstration of Hybridization techniques using potted plants.

TEXT BOOKS:

1. Verma, P.S. and V.K. Agarwal 2009, Genetics, S. Chand & Co.
2. Dryansakar 1992. Cytology & genetics. V.R. Tata MC Graw-Hill Publishing company Ltd
3. R.S. Shukla & P.S. Chandel. 2007 Cytogenetics, Evolution, Biostatistics and Plant Breeding. S. Chand & Co Ltd
4. P.S. Verma, V.K. Agarwal. 2014. Cytology. S. Chand & Co Ltd.
5. Verma, P.S. and V.K. Agarwal, 1998, Concepts of evolution
6. Marabiyal (Tamil Book) by Palaniappan

REFERENCE BOOKS:

1. Allard R.W. 1960, Principles of Plant breeding, John Wiley & Sons, New York.
2. Levin, R.P. 1962 Genetics, Reinhart & Winston
3. S.P. Misra 2011. Evolution, Ecology, Cell Biology & Genetics. Silver line Publisher
4. Prakash. S.. Lohar. 2009. Cell and Molecular Biology MJP Publisher.
5. Robert. F. Weaver-2005. Molecular Biology. MC Grow Hill international edition.

Journals

1. Indian Journal of Genetics and Plant Breeding
2. The International Journal of Biostatistics

Weblinks:

1. <https://en.m.wikipedia/.ore>wiks>
2. <https://www.nature.com>
3. <https://www.britannica.com>
4. <https://www.edx.org>biostatistics>
5. <https://bioinformatics.weizmann.ac.il/cards/>

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
1	Acquire knowledge on basic aspects of Mendelian and Non-Mendelian genetics
2	Understand the principles of inheritance factors in plants
3	Analyse the basic facts involved in plant breeding and crop improvement
4	Compare the conventional and modern methods of breeding crop plants.
5	Assess the quantification of data using statistical analysis using commercially available tools

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	1
CO2	2	2	2	2	1
CO3	2	1	2	2	1
CO4	1	1	2	3	2
CO5	1	1	1	3	3
AVERAGE	1.8	1.6	1.8	2.6	1.6

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER –V
CORE PAPER – X
MORPHOLOGY, TAXONOMY OF ANGIOSPERMS AND
ECONOMIC BOTANY**

Lecture Hrs : 6 Hrs

Credits:5

THEORY :**COURSE OBJECTIVES**

- To provide a detailed account of morphology of plant body
- To introduce various classification (Classical and Modern) methodologies in vogue for Angiosperms
- To impart knowledge about the economic importance of higher plants under the taxonomic hierarchy.

- To create an exposure on preservation techniques of plants leading to their collection during field trips.

COURSE OUTLINE

- UNIT I** : A brief account of morphology of root, stem and leaf with modifications (storage, pneumatophores, cladode, phyllode, pitcher). Types of inflorescence, flower and types of fruits.
- UNIT II** : Herbarium technique. Binomial nomenclature ICBN, author citation. Botanical survey of India. Systems of classification – outline classification of Natural (Bentham & Hooker) and Modern (Cronquist) – Merits and Demerits.
- UNIT III** : Key- types and their importance in Taxonomy. Basics of key preparations to aid classification of angiosperms, applied taxonomy – Numerical taxonomy, Chemotaxonomy and molecular techniques (ELISA, RAPD).
- UNIT IV** : Detailed study of the range of characters and plants of economic importance in the following families. Dicotyledonae: Polypetalae: Annonaceae, Fabaceae (Caesalpinoideae), Capparidaceae, Rutaceae, Cucurbitaceae, ,
- UNIT V** : Gamopetalae: Rubiaceae, Sapotaceae, Apocynaceae, Monoclamydeae: -Nyctaginaceae, Euphorbiaceae, Monocotyledonae: Commelinaceae and Poaceae.

PRACTICALS:

1. Description of a plant in technical terms
2. A detailed study of the range of vegetative and floral characters of plants belonging to the families mentioned in the theory.
3. Submission of 15 herbarium sheets with proper field notebook for Practical examination
4. Field trip to any place within or outside the state for 5 days for plant collection.
5. Submission of record.

RECOMMENDED TEXT BOOKS:

1. Gupta R.K. 1972 Text book of systematic botany, Atma Rama & Sons
2. Vashista, P.C. 1974. Taxonomy of Angiosperms S. Chand & Co
3. Rao K.N.R. Krishnamurthi, K.V. 1980 Angiosperms, S.Viswanathan Pvt. Ltd.
4. Pandey, H.P. 2011 Plant Taxonomy, Silverline Publications, New Delhi
5. B.P. Pandey 2012. Taxonomy of Angiosperm. S. Chand Company Ltd.
6. Angiospermgalin vagaippaadu by S. Palaniappan
7. Angiospermgalin karuviyal by K. Periasamy

REFERENCE BOOKS:

1. Lawrence, G.H.M. 1967, Taxonomy of Vascular Plants, Oxford 7 IBH Publishers
2. .Sambamoorthy. 1972. Economic Botany. MC Graw Hill
3. V.V.Sivaranjan,1991 Plant Taxonomy. Oxford and IBM Publishing pvt Ltd.
4. O.P.Sharma,2008 Plant Taxonomy.Tata MC Grow-Hill Publishing Company Ltd.
5. . Plant Systematics- Gurcharan singh-2012 Oxford&BH Publishing co Pvt Ltd Delhi

Journals:

1. Plant Systematics and Evolution
2. Indian Journal of Plant Sciences

Weblinks:

1. <http://www.iaat.org.in>
2. <http://www.bsi.gov.in/links/>
3. <http://www.ipni.org>
4. <http://www.theplantlist.org>
5. <http://www.botany.si.edu/ing>

COURSE OUTCOMES

CO NO.	CO STATEMENT
1	Outline the classification of higher plants
2	Apply the preservation techniques on maintaining herbarium of selected plants and apply the naming of plants
3	Acquire knowledge on morphology of plant parts and their adaptations
4	Compare the range of characters of specific families leading to their identification
5	Acquire information about the economic importance of various angiospermic plants.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	2
CO2	1	2	2	2	1
CO3	3	3	3	2	2
CO4	3	3	3	3	2
CO5	2	2	2	3	3
AVERAGE	2.4	2.6	2.2	2.2	2

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

B.Sc. DEGREE COURSE

PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER –V
CORE PAPER – XI

ECOLOGY AND PHYTOGEOGRAPHY

Lecture Hrs : 6 Hrs

Credits:5

THEORY

Objectives:

- 1 .To provide a detailed account on the ecological niches occupied by various live communities.
- To relate the morphological, anatomical adaptations to the ecological niches occupied by the plants/
- To give a clear picture about the geographical distribution of plants in India.

Unit I Ecology & its importance– biotic and abiotic factors and their influence on vegetation-a brief account of microbes, plants, soil, wind, light, temperature, rainfall and fire. Adaptation in Xerophytes, Hydrophytes, Epiphytes and Halophytes.

Unit II Ecosystem concepts– Structure and function, energy flow, food chain, food web.Major ecosystems – Grassland, Pond, Forest.

UnitIII Population Ecology – Definition, characteristics- Natality and mortality, Dynamics, Survivership curve, r and k selections, Gause exclusion principle.

UnitIV Community Ecology – Succession, causes - general processes of succession, climax concept in succession.Xerosere&Hydrosere.

UnitV Biogeographical regions of India – Forest classification of India - Distribution types – continuous and discontinuous (wide, endemics) Vegetation of Tamilnadu.Endangered species – IUCN threat catagories – Red Data Book.

PRACTICALS:

1. Study of the morphological features of xerophytes, halophytes and epiphytes.
2. Map of Phyto-geographical regions of India.
3. To carry out a short field trip in order to study about plants under various ecosystems.

TEXT BOOKS:

1. Sharma P.D. 1993. Environmental Biology and Toxicology Rastogi & Co., Meerut
2. Kumar H.D. 1990. Modern concepts of Ecology. Vikas publishing
3. Shukla R. and Chandel P 1990. Plant Ecology. S. Chand & Co. Pvt. Ltd
4. S.Ambasht 1988. Plant Ecology, Student's Friends & Co.
5. P.C.Das 2007. Plant Ecology AITBS Publishers India
6. Sutrusoozhaliyal (Tamil Book) by Chandrasekaran

REFERENCE BOOKS

1. Daubenmire R.F. 1973. Plant Environment, John Wiley.
2. Odum. E.P. 1983. Basic Ecology Holt Saunders International editions.
3. Paul Colinvaux 1986. Ecology, John Wiley
4. Edward J. Kokmandy 1994 Concepts of Ecology Prentice Hall of India Pvt Ltd.
5. R.S. Shukla and P.S. Chandal 2014 Ecology and Utility of Plants. S. Chand & Co Pvt Ltd.

Journals:

1. Indian Journal of Ecology
2. Journal of Functional and Environmental Botany

Weblinks:

1. <http://www.sustainability.asu.edu>
2. <http://www.ecology.com>
3. <http://en.wikipedia.org/wiki/Ecology>
4. <http://www.exploratorium.edu/Is/infosources/ecologyinfo.html>
5. <http://www.en.m.wikibooks.org>

COURSE OUTCOME:

CO NUMBER	CO STATEMENT
1	Classify the various ecosystems
2	Acquire information about structural and functional aspects of ecosystems.
3	Understand the importance of ecological adaptations of plants
4	Analyse the quantification of population ecology
5	Compile the various phytogeographical regions of India and Tamil Nadu.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	2	2	3	3	3
CO3	2	2	3	2	3
CO4	1	2	2	2	3

CO5	1	1	1	1	1
AVERAGE	1.8	2	1.8	2.2	2.6

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
Effective from 2017 – 2018
SEMESTER –V CORE PAPER XII
PRACTICAL V (CORE IX, X, XI)

Practical Hours : 6 Hours

Credits:4

PRACTICALS

COURSE OBJECTIVES

- To enable students to have hands on experience to identify and classify plants
- Acquire knowledge on genetics problems on construction of chromosomal maps. plant breeding and biostatistics
- To enable students to find out the economic importance of plants

KEY

A&B- Taxonomy

Identification of the families- Annonaceae, Fabaceae (Caesalpinoideae), Capparidaceae, Rutaceae, Cucurbitaceae, Rubiaceae, Sapotaceae, Apocyanaceae, Nyctaginaceae, Euphorbiaceae, Commelinaceae, Poaceae.

C – Taxonomy

Technical description of any available plant of any family.

D- Genetics

Chromosome mapping (external examiner shall select a problem on the spt by referring the record of the student submitted for valuation).

E- Genetics

Genetics problem (Any problem – monohybrid, dihybrid and interaction of factors).

F-Biostatistics (One problem to be chosen from the record)

G&-H Economic botany

Seeds- Rice, Wheat, Barley, Maize, Corn, Ragi, Cocoa, Coffee, Castor

Roots- Manihot., Stem – Sugarcane, Latex –Rubber, Leaves- Curry leaves.

Fruits- Orange, Lemon, Sweet lime, Amla, Sapota, Custard apple, Snake Gourd,

Ridge Gourd. Chow- chow, Bitter Gourd, Melon, Cucumber, Musk melon, Pumpkin.

I- Genetics

Ratio of monohybrid cross , Di-hybrid cross, Test Cross, Back Cross, Incomplete dominance, Complimentary, Supplementary, Epitasis, Duplicate,

J -Plant breeding

Bagging ,Emasculation.

K- Phytogeography map/Ecology

Botanical provinces of India

Deciduous, Thorn & Mangrove forest of India

Tropical Evergreen forest of India.

Hydrophyte, Xerophyte, Epiphyte (Ecology)

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
1	Classify the various families of plants
2	Acquire information about genetics problems
3	Understand the importance of biostatistics in biological experiments
4	Analyse the plant breeding methods
5	Compile the various phytogeographical regions of India and Tamil Nadu.

B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
Effective from 2017-2018
SEMESTER-V
CORE PAPER XII – PRACTICAL – V (CORE IX, X, XI)

TIME:3hrs

MAXIMUM : 75 MARKS

PRACTICAL : 60 MARKS

RECORD : 10 MARKS

HERBARIUM: 5 MARKS

1.Refer A&B to their respective families. Find out the characters on which identification is based at each level (Diagram not necessary)

A மற்றும் B யின்தாவரக் குடும்பத்தினை கண்டுபிடி. தக்க காரணங்களை எழுதுக.

(2X4=8 marks)

2.Describe C in technical terms. Draw diagrams of the floral parts and construct the floral diagram and write the floral formula.

C யினை கலை சொற்களால் விவரி. மலரின் பாகங்கள், பூச்சித்திரம் வரைந்து பூச்சுத்திரம் எழுதுக

(1X10=10 marks)

3.Construct the chromosome map D. Find the relative distance and the linear order of genes.

D யின்குரோமோசோம் வரைபடம் வரைக. அவற்றின் ஜீன்களின் வரிசை, தர இடைவெளி ஆகியவற்றை கண்டுபிடி.

(1X10=10 marks)

4.Solve the genetic problem E

E யில் உள்ள மரபியல் புதிர் இனை கணக்கிடுக.

(1X5=5 marks)

5. Solve the biostatistical problem F given to you

F இல்கொடுக்கப்பட்டுள்ளபுள்ளியில்கணக்கிற்குவிடையளி. (1x7=7marks)

5.Mention the name of the genus, species, family and morphology of the useful part of G & H.

G மற்றும் H இன்சிறிற்றினபெயர், பேரினப்பெயர், குடும்பம்மற்றும்பயன்படும்தாவரபாகத்தைஎழுதுக. (2X4=8 marks)

6. Comment on I , J and K

I, J மற்றும் K யில்உள்ளவற்றைபற்றிகுறிப்புகள்தருக. (3X4=12 marks)

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
Effective from 2017-2018
SEMESTER - V
CORE PAPER - XII
PRACTICAL – V (CORE IX, X, XI)**

Maximum marks: 75

Practicals: 60 marks

Record : 10 MARKS

Herbarium: 5 MARKS

KEY

1. A	- Taxonomy	(2x4 = 8 marks)
B	- Taxonomy	
2. C	- Taxonomy- technical description	(1x 10 =10 marks)
3. D	- Chromosome map	(1x 10 = 10 marks)
4. E	-Genetic problem	(1 x 5 = 5 marks)
5. F	- Biostatistical problem	(1x7= 7 marks)
5. G	-Economic Importance	(2 x 4 = 8 marks)

H -Economic Importance

6. I -Genetics (3 x 4 = 12 marks)

J -Plant Breeding

K - Phytogeography map /Ecology adaptations

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER –V
ELECTIVE (MAJOR) -I**

PLANT PROTECTION

Lecture Hrs : 5 Hrs

Credits:4

THEORY :

COURSE OBJECTIVES

- To impart knowledge on the plant diseases and their physiology
- To enable the students to identify the symptoms of common plant diseases and the importance of disease control in plants
- To stress the need for biological control processes and appliances

COURSE OUTLINE

- UNIT I** A general account of types of plant diseases and causal agents – symptoms caused by bacteria, fungi, viruses, mycoplasma. Host pathogen interaction – defence mechanism- structural and biochemical
- UNIT II** Study of symptoms, etiology and control measures of the under mentioned diseases:-
1. Red rot of sugarcane, 2. Black rust of wheat, 3. Smut of maize, 4. Blast of paddy, 5.Citrus Canker, 6. Papaya leaf curl and 7. Little leaf of Brinjal.
- UNIT III** Principles of plant protection
1. Exclusion and eradication (quarantine) 2. Cultural practices, 3. Chemical – protectant fungicides and systemic fungicides. Definition and mode of action of sulphur fungicides, copper fungicides (Bordeaux), Organic fungicides (Thiocarbamates, Captan) Systemic fungicide (Benzimidazole).

UNIT IV Biological control - Types of Pesticides - Biopesticides - Virus (Baculo virus), Bacteria (*Bacillus thuringiensis*) and Fungi (*Trichoderma*) – Integrated pest management (IPM)

UNIT V Plant protection appliances – sprayers – dusters – soil injectors – seed dressing drum.

RECOMMENDED TEXT BOOKS:

1. Rangasami, G. 1994. Disease of Crop Plants. Printice Hall of India Ltd.
2. Mukundan, T.K. Plant Protection, Principle and Practice, Asia Publishing House.
3. Thaavara noiyial (Tamil Book) by S. Palaniappan

REFERENCE BOOKS:

1. Bap Reddy – 1968. Plant Protection in India. Allied Publishers.
2. Chattopadhyay, S.B. Principles and Procedures of Plant Protection.
3. Chaudhury & Majid, S. 1954. Hand Book of Plant Protection, Department of Assam.
- 4 Walker, J.C. 1969. Plant Pathology. Tata MC Graw – Hill Publishing Co. Ltd.
- 5 N.G. Ravichandra 2013. Fundamentals of Plant Pathology. PHI Learning Private

Journals

1. Journal of Plant protection Research
2. Journal of Plant Diseases and Protection

Weblinks:

1. <http://www.cabi.org>
2. <http://www.icar.org.in>
3. <http://www.cropscience.bayer.in>
4. <http://www.iari.res.in>
5. <http://www.ctcri.org>

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
1	Study the classification of plant diseases and pathogens
2	Understand the symptomatology of selected plant diseases
3	Study the inter relation between pathogen and host
4	Acquire knowledge about the importance of biological control of plant diseases
5	Imbibe information about the plant protection appliances used.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2

CO2	3	3	2	3	2
CO3	2	3	3	3	2
CO4	1	2	2	2	3
CO5	1	1	1	1	3
AVERAGE	2	1.8	2.2	2.4	2.4

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER –VI
CORE PAPER –XIII
MOLECULAR BIOLOGY, PLANT BIOTECHNOLOGY AND
BIOINFORMATICS

Lecture Hrs : 6 Hrs

Credits:5

THEORY :

COURSE OBJECTIVES

- To facilitate the student to master the fundamentals of molecular biology
- To impart knowledge about application of molecular tools in creating intergeneric and inter specific plants
- To expose the practical nuances of biotechnology ,computing sciences and information tools by way of lab visits.

COURSE OUTLINE

- UNIT I** DNA – structure, types, function and replication ; RNA – structure, types and function. Genetic code. Transcription and Translation in prokaryotes. Gene regulation in prokaryotes – lac Operon and trp Operon. Autoregulation and feedback inhibition
- UNIT II** Biotechnology – definition –Scope & Applications. Genetic engineering – aims of genetic engineering, techniques of gene manipulation. Recombinant – technology, outline of cloning – Vectors: Plasmid (pBR322) Cosmid pJB8 – Selection of recombinants (Replica plating).
- UNIT III** Plant cell and tissue culture – totipotency, nutrient medium – MS & B5 media. Sterilization, inoculation and maintenance of culture. Micropropagation – root and shoot culture and its uses. – Anther culture and Haploid production. Somaclonal embryos. Synthetic seeds.
- UNIT IV** Protoplast culture, isolation, purification and regeneration - Protoplast fusion- hybrid and cybrid. Application of PTC (Plant Tissue Culture) in agriculture, horticulture and forestry.

UNIT V Internet basics – data bases – raw data bases and processed database – Biological database. Protein and gene database – Data base management – Searching the data base – protein structure prediction – gene finding – Molecular visualization of proteins and phylogenetic analysis – application – Drug targeting.

RECOMMENDED TEXT BOOKS

1. Dubey, R.C. 2012 A text book of Book of Biotechnology. S.Chand& Co. Ltd.
2. Ignacimuthu S. 1996. Basic Biotechnology, Tata McGraw hill
3. Uyirthozhilnutpaviyal (Tamil Books) by S. Palaniappan

REFERENCE BOOKS:

1. Treven M.D.S. Buffery, R.G. Goulding and F.Standary. 1987 Biotechnology: The Biological Principles.TataMc.Graw Hill.
2. S.S.Purohit 2003. Bioechnolgy - Fundamentals and Applications. Student Edition Jodpur
3. Attwood, T.K. and Parry Smith, D.J. (1999). Introduction to bio informatics. Pearson Education Asia.
4. Ramawat K,G 2012 Molecular Biology and Biotechnology. S.Chand& Co. Ltd.
5. Kumar H.O. 1993. A text book of Biotechnology, East West Affiliate Press

Journals:

1. Indian Journal of biotechnology
2. Journal of Applied Biology and Biotechnology

Weblinks:1. <http://www.dpmb.ac.in>

2. <http://www.nature.com/genomics>

3. <http://www.bio.org>

4. <http://www.efbweb.org>

5. <http://www.isb.vt.edu>

CO NUMBER	CO STATEMENT
1	Understand the basic nature of hereditary biomolecules and their classification
2	Acquire basic knowledge on the biotechnology techniques and applications
3	Study the detailed account of plant tissue culture and its applications
4	Understand the basics of internet and bioinformatics
5	Learn the various tools of applied aspects of bioinformatics.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2
CO2	3	3	3	3	3
CO3	2	3	3	3	3
CO4	2	1	1	3	3
CO5	1	3	3	3	3
AVERAGE	2.2	2.6	2.6	3	2.8

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER –VI
CORE PAPER – XIV
PLANT PHYSIOLOGY AND BIOCHEMISTRY

Lecture Hrs : 6 Hrs

Credits:5

THEORY :

COURSE OBJECTIVES

- To disseminate facts on the fundamental aspects of biochemical interactions specific to plants
- To provide in depth understanding on the various laws governing the physiology of plants.
- To enhance the knowledge on physiology and biochemical aspects through series of experiments

COURSE OUTLINE

- UNIT I** Structure and classification of carbohydrates, lipids, proteins and nucleic acids – Enzymes – Properties, nomenclature and classification as per IUBC (enzyme commission of the International Union of Biochemistry) cofactors, coenzymes and mode of action. Factors affecting enzyme action.
- UNIT II** Water relations – imbibition, diffusion, permeability, osmosis, plasmolysis, osmotic pressure-DPD. Absorption of water – Apoplast and symplast. Mechanism – passive and active. Translocation of water – Ascent of sap – Transpiration – types and significance, factors. Stomatal mechanisms.
- UNIT III** Photosynthesis – radiant energy, red drop and Emerson's enhancement effect, pigment systems, cyclic and non-cyclic electron transport – C₃ and C₄ pathways – factors affecting photosynthesis – Photorespiration. Respiration – Aerobic – anaerobic – glycolysis – Krebs's cycle – electron transport system – oxidative phosphorylation – factors affecting respiration.

UNIT IV Nitrogen assimilation – importance of nitrogen in plant life – nitrogen fixing organisms, biological nitrogen fixation – legume – *Rhizobium* symbiosis.

UNIT V Growth – Plant growth regulators Physiological role of auxins, gibberellins, cytokinins, ethylene and abscissic acid. Photomorphogenesis – Photoperiodism, Phytochromes. Dormancy (Seed and bud), Seed viability and germination.

PRACTICALS

Experiments to be performed and recorded by students individually.

1. Determination of solute potential by plasmolytic method.
2. Effect of temperature and chemicals on membrane permeability.
3. Study of relative rates of transpiration in different plants.
4. Determination of percentage of viability of seeds with Tetrazolium chloride.
5. Separation of plant pigments by paper chromatography.
6. Study of rate of photosynthesis under different light intensities.
7. Comparison of rate of respiration on different respiratory substrates.
8. Determination of pH of soil and plant sap using pH meter.

DEMONSTRATION EXPERIMENTS:

1. Test for starch and proteins.
2. Hydrolysis of starch by amylase.
3. Induction of roots in leaves by auxins.
4. Effect of pH on catalase.

RECOMMENDED TEXT BOOKS:

1. Rama Rao A.V.S.S 1988, Text Book of Biochemistry, L.K & S Publishers
2. Rao K.N Sudakar Rao G and Bharathan S 1987, The Functioning of Plant. S.Viswanathan Pvt Ltd.
3. Dr.S.K.Verma and Mohit Verma 2014. A textbook of Plant Physiology
4. Seyalial (Tamil Book) by Chandrasekar

REFERENCE BOOKS:

1. Salisbury F.B and Ross C.W 1991, Plant Physiology, Wassworth Publishing Co, Belmont.
2. Bidwell R.G.S 1974, Plant Physiology. Macmillan Publication Co, New York.
3. Ting I.P 1982, Plant Physiology, Addison Wesley Publication Co. Philippines.
4. Michealis I and Torrey J.C 1956, Plant in Action, W.H. Freeman.
5. Withem, F.H Blaydes D.F and Devlin R.N 1972, Experiments in Plant Physiology, Van Nostrand Reinhold Co.

Journals:

1. Journal of Biomolecules and Biochemistry
2. Journal of Experimental Biology

Weblinks:

1. <http://www.mdpi.com>
2. <http://www.researchgate.net>
3. <http://www.livescience.com>
4. <https://academic.oup.com>
5. <http://www.teachline.ls.huji.ac.il>

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
1	Obtain a detailed account on the classes of biomolecules and their functions
2	Acquire knowledge on the physiological processes of plants
3	Establish the inter relationship between biochemical processes.
4	Study the importance of nitrogen as an element in relation to plant physiology
5	Acquire an in depth understanding on the growth and development processes in plants.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	2	3	3	3	3
CO3	3	3	3	3	3
CO4	2	3	2	3	3
CO5	2	3	3	3	3
AVERAGE	2.4	3	2.8	3	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY**

Effective from 2014-2015

SEMESTER - VI

CORE PAPER – XV PRACTICAL –VI (CORE XIII, XIV)

Practical Hours : 6 Hours

Credits:4

PRACTICALS

COURSE OBJECTIVES

- To conduct experiments to prove scientific concepts pertaining to plant physiology and biochemistry
- To make notes on the basics of biotechnology and microbiology
- To identify the physiology setups, molecular biology, bioinformatics work sheets

KEY

1. A - Physiology – Individual Experiment - (1 x 15 = 15 marks)
Aim & Requirements-2, Procedure-3,
Observation & Tabulation – 3,
Diagram/ calculation-3, Result -2.
Set up - 2
2. B - Physiology – Common Experiment - (1 x 10 = 10 marks)
Requirements - 1, Procedure – 2, diagram - 1,
Observation & tabulation -2, result- 2.
Set up -2
3. C - Physiology – Common Set up - (1 x 10 = 10 marks)
Demonstration Experiments
Procedure -5 marks,
Diagram-1, Observation/Reasons –4 marks
4. D - Biotechnology – Protocol - (1 x 10 = 10 marks)
(MS/ B5 culture medium)
Protocol-5, tabulation of ingredients-5
5. E - Instruments/Apparatus - (4 x 5 = 20 marks)
Name – 1, diagram –1, notes – 3
- F - Growth hormone (auxin, gibberellin, cytokinin)
Name – 1, notes- 4
- G - Biotechnology
Callus/ Explant culture/
Synthetic seeds production /
Agar agar
(Name- 1, protocol / notes – 4)
- H - Molecular Biology/Bioinformatics
Diagrammatic representations of vectors (pBR322, pJB 8)
Protein structure prediction .

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
1	To validate the proof on concepts of Plant physiology and biochemistry.
2	Acquire knowledge on the physiological processes of plants
3	To get a comprehensive account on the biotechnological and microbiological techniques and instruments used.
4	Media preparation for tissue culture
5	Acquire an in depth understanding of molecular biology and bioinformatics

B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
Effective from 2017-2018
SEMESTER- VI
CORE PAPER - XV
PRACTICAL –VI (CORE XIII & XIV)

Time:3 Hours

MAXIMUM :75 Marks

PRACTICAL : 65 MARKS

RECORD :10 MARKS

1.Outline the procedure apparatus and materials required for investigating the physiological problem assigned to you. Set up the experiment. Tabulate the data,observe and record the results. Leave the set up for valuation.

கொடுக்கப்பட்டசெயலில்சோதனைAன் தேவையானசெயற்முறைஉபகரணங்களைஎழுதுக.
சோதனையைநிறுவி, அதன்முடிவுகளைஅட்டவணைப்படுத்துக.
செயலின்அமைப்பைமதிப்பீட்டிற்குவைக்கவும்.

(1x15= 15 marks)

2.Write the procedure, Conduct the experiment, and tabulate your result for B.

B ல்உள்ளசெயலியல்அமைப்பின்செய்முறையைஎழுதுக.

சோதனையின்முடிவுகளைஅட்டவணைப்படுத்திமுடிவினைதருக. (1x10=10 marks)

3.comment on the Set up C.

C யில்கொடுக்கப்பட்டசோதனைஅமைப்பைவிளக்குக.(1x10=10 marks)

4.Write the protocol of the given culture medium D.

D யில்கொடுக்கப்பட்டஊடகத்தின்தயாரிப்புமுறையைஎழுதவும்.(1x10=10 marks)

5.Write critical notes on E,F&G.

E, F ,மற்றும்Gபற்றிதகுந்தகுறிப்புஎழுதுக.

(4x5=20 marks)

Effective from 2017-2018
SEMESTER - VI
CORE PAPER – XV PRACTICAL –VI (CORE XIII, XIV)
KEY

PRACTICAL : 65 MARKS
RECORD : 10 Marks

1. A	-	Physiology – Individual Experiment	-	(1 x 15 = 15 marks)
2. B	-	Physiology – Common Experiment	-	(1 x 10 = 10 marks)
3. C	-	Physiology – common Set up	-	(1 x 10 = 10 marks)
4. D	-	Biotechnology – Protocol	-	(1 x 10 = 10 marks)
5. E	-	Instruments/Apparatus	-	(4 x 5 = 20 marks)
F	-	Growth hormone / Diagrams / Graph		
G	-	Biotechnology		
H	-	Molecular biology/bioinformatics		

B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018

SEMESTER –VI

ELECTIVE (MAJOR) – II

MICROBIOLOGY

Lecture Hrs:5Hrs
:4

Credit

THEORY :

COURSE OBJECTIVES

- To provide an insight on the microbial world and their importance.
- To highlight the importance of studying microbiology
- To highlight the useful and harmful effect of microbes

COURSE OUTLINE

- UNIT I** : Scope, Microscopy- Light microscopy- Principle-construction and application (Bright Field, Dark field and Phase contrast). Measurement and Micrometry. .
- UNITII** : General Characters of bacteria, structure – Reproduction, Nutrition – Photosynthetic, Chemosynthetic, Mycoplasma, PPLO Methods of Sterilization, culture media, isolation and culture of microorganism, Microbial growth, staining of bacteria – Gram’s stain.
- UNIT III** : General Characteristic features of virus, Classification, structure multiplication&transmission – TMV, Phages: Bacteriophages, Cyanophages, Mycophages – Viroids& Prions.
- UNIT IV** : Microbiology of food – food spoilage, types of microbes associated with food spoilage. Food poisoning- Botulism and food preservation.
- UNIT V** : Pharmaceutical & Industrial importance of microbes (antibiotic production –Penicillin. Industrial – Citric acid) Vaccines- types and production of Poliovaccine, probiotics and its significance).

RECOMMENDED TEXT BOOKS:

1. Pelczar Jr. M.J., E.C.S. Chan and N.R. Krieg. 1986. Microbiology 5th edition. Mc.Graw Hill Book Company, New York.
2. Dr.R.C.Dubey and Dr.D.K. Maheswari 2014. A text book of Microbiology,

- S.Chand and Co.
3. Nunnuyiriyal (Tamil Book) by S. Palaniyappan

REFERENCE BOOKS:

- 1.Power&Daginawala, General microbiology Vol. I & II Himalaya Publishing House.
- 2.Atlas R.M. Microbiology – Fundamentals and applicants. Mc. Millan Publishing Company, New York.
- 3 .L.E. Casida JR. 2009.Industrial Microbiology New Image International (p) Ltd.
4. Dr.P.K.Sivakumar, Dr.M.M.Joe and Dr.K.Sukesh .2010. An Introduction to Industrial Microbiology Chand and Co
5. Kalaichelvan, P.T 2004 Microbiology and Biotechnology. MJP Publishers

Journals

1. International Journal of Microbiology
2. Journal of Applied Microbiology and Biotechnology

Weblinks:

1. <https://www.doccity.com/en/economic>
2. <https://www.nature.com>subjects>
3. <https://www.nebi.nim.nih.gov>books>
4. <https://www.hindawi.com>bmri>cfp>
5. <https://courses.lumenlearning.com>

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
1	Classify the basic instrumentation used for observing microbes
2	Acquire in depth knowledge on structural and reproductive aspects of microorganisms
3	Learn the outline of food microbiology in relation to spoilage and preservation
4	Acquire information about the applications of microbiology
5	Learn the processes of microbial growth

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2
CO2	3	3	3	3	2

CO3	1	2	3	3	3
CO4	2	2	3	3	3
CO5	2	3	3	3	3
AVERAGE	2.2	2.6	3	3	2.6

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY
CORRELATED-1 NO CORRELATION-0

**B.Sc. DEGREE COURSE
PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SYLLABUS Effective from 2017-2018
SEMESTER = VI
ELECTIVE (MAJOR) - III**

HORTICULTURE

Lecture Hrs :5Hrs

Credits: 4

THEORY

COURSE OBJECTIVES

- To provide an insight on the various technical aspects of practicing horticulture.
- Acquire knowledge on manuring, weeding, irrigation of horticultural crops
- To give an account of floriculture and landscaping.

COURSE OUTLINE

UNIT I: Horticulture- Definition-importance of horticulture.Types of Garden- Formal, Informal, Kitchen& Terrace. Garden components- Lawn, trees, shrubs, climbers and creepers, flower beds and borders, paths, rockery, green house, bonsai.

UNIT II: Plant propagation methods: cutting, layering, budding and graftingStock- scion relationship in important horticultural crops. Types of pots and containers- pot mixtures and potting media for different ornamentals. Landscaping.

UNIT III: Manures- role , advantages and disadvantages of important types of fertilizers. Time and application of manures and fertilizers. Foliar applicants and nutrients.

UNIT IV: After care of plants: weeding, top dressing methods of pruning and topiary. Lawn making: type of lawn grasses and maintenance. Plants suitable for hedges.

UNIT V: Floriculture – definition –importance . Commercial floriculture - Cut flowers- Roses, Chrysanthemum, orchids, gladiolus, carnation, Iris. Commercial flowers - Jasmine, Rose. Flower arrangements- fresh and dry. Bonsai – Ikebana.

RECOMMENDED TEXT BOOKS

1. Arora J.S. 1990. Introductory Ornamental horticulture. Kalyani publications
2. Kumar, N. 1989. Introduction to Horticulture ,Rajalakshmi Publications.
3. Thottakkalaiyiyal matrum payir perukkaviyal (Tamil Book) by Chandrasekaran

REFERENCE BOOKS:

1. J. B. Edmon et al., 1990, Fundamentals of Horticulture. Tata McGraw Hill Publishing Co. Ltd.. New Delhi.
2. Manibhushan Rao, K, 1991, Text Book of Horticulture, MacMillan India pvt. Ltd. Delhi.
4. Mathew, I.P. and S. K. Karikari, 1994, Horticulture; Principles and practice: MacMillan Press Ltd. Publ.
5. Marshall Woodrow, G. 1999, Gardening in India, Biotech Books, Delhi.
6. Prasad S and U. Kumar, 1999, Principles of Horticulture, Agro Botanica, Bikaner, India.

Journal:

1. Indian Journal of Horticulture
2. International Journal of Horticulture and Crop Production

Weblink:

1. <http://www.iihr.res.in>
2. <http://www.nhb.gov.in>
3. <http://www.midh.gov.in>
4. <http://www.uhsbagalkot.edu.in>
5. <http://www.en.m.wikipedia.org>

COURSE OUTCOMES

CO NUMBER	CO STATEMENT
1	Learn the basic components of horticulture
2	Acquire knowledge on various tools of plant propagation
3	Study the desirable adaptations for improvement of horticultural crops
4	Learn the importance of sustenance of care for horticultural plants.
5	Imbibe an account of floriculture and flower arrangements.

MAPPING – COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2
CO2	3	3	3	3	3
CO3	2	3	3	3	3
CO4	3	3	3	3	3
CO5	1	3	2	3	3
AVERAGE	2.4	3	2.8	3	2.8

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1 NO CORRELATION-0

Value Education
Compulsory Course – V Semester
Syllabus

Credits : 2

Objectives:

1. To impart the human values to the students.

1. 'Building self- confidence' By Norman Vincent Peale
2. 'Living Excellence' By Anthony Robbins
3. 'Kind of Values' by S.Ignacimuthu S.J.
4. 'What is Ethic?' by Swami Vivekananda
5. 'Essential Characteristics of Human Rights by H. Victor Conde

Course Outcome:

CO1: The students will have knowledge about human ethics

Content and Treatment as in:

1. Touchstone : Synergy of values.

QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS)

Anna Salai, Chennai – 600 002.

DEPARTMENT OF ZOOLOGY

M.Phil., ZOOLOGY

SYLLABUS



From the Academic year 2017 – 2018

CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION

CONTENTS

Rules and regulations for the Programme

Programme Outcomes

Programme Specific Outcomes

Programme Profile

Evaluation pattern for CA

Rubrics for CA Evaluation

Evaluation Pattern for End Semester

Course Profile

**QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMENS
(AUTONOMOUS)**

ANNASALAI, CHENNAI 600 002.

1. ELIGIBILITY

A Candidate who has qualified for the Master's Degree in Computer Science/Computer Applications/Information Technology of University of Madras or any other University recognized by the University of Madras as equivalent there to (including old Regulations of any University) subject to such conditions as may be prescribed

therefore shall be eligible to register for the Degree of Master of Philosophy (M. Phil) and undergo the prescribed course of study in a Department concerned.

A candidate who has qualified in Master degree with not less than 55% of marks in the concerned subject shall be eligible to register for M. Phil course. SC/ST candidates are exempted by 5% from the prescribed minimum marks.

2. DURATION

The duration of the M. Phil course shall be one year consisting of two semester for the full-time programme.

3. COURSE OF STUDY

The course of study shall consist of

Part-I : 3 written papers, and

Part-II : Dissertation.

The three papers under Part-I shall be:

Paper- I : Research Methodology

Paper –II : Performance Evaluation of Systems

Paper I & II in Part-I shall be common to all candidates in a course. Paper I,II& III shall consist of 5 units covering the subject requirements of the course offered. The Syllabi for Paper I,II&III has been approved by the board of studies. The subject specialization for paper III in Part-I shall be prescribed by each research Guide/Supervisor advisor which also approved by the board of studies. The number of specialized papers by the research advisor can be more than one. Paper- I & II shall be set externally and valued by two examiners, one internal and one external. The concerned HOD will be the Chairman of the Board of Examiners to pass the results. Paper III shall be conducted by the Controller of Examination.

4. SCHEME OF EXAMINATION

4.1 Part-I

Paper –I : Research Methodology

Paper-II : Recent Trends in Zoology

Paper-III : Field of Specialization

4.2 Written Examination

The examinations for papers-I,II and III shall be taken at the end of March of every year. Each paper shall have 100 marks for the examination (written). The duration for each examination shall be 3 hours. A candidate shall be declared to have passed Part-I examination if he secures not less than 50% of marks.

4.3 Part-I Credits

Paper	Name of the Paper	Contact Hours	Library Hours	Total Hours	Credits

I	Research Methodology	6	4	10	6
II	Recent Trends in Zoology	6	4	10	6
III	Field of Specialization	6	4	10	6
Total				30	18

4.4 Part-II

4.4.1 Dissertation

For carrying out the dissertation the mandatory requirements is a pass in paper III. Every student is expected to give two seminars one concerning Review of Literature just within three weeks from the beginning of the second semester and other on data analysis just before the submission of the final draft of the dissertation. Candidates shall submit the Dissertations to the Controller of Examination at the end of 5th Month after the theory examination. The above said time limit shall start from 1st of the month which follows after the month in which Part-I examinations are conducted. If a candidate is not able to submit his Dissertation within the period stated above, he shall be given an extension of one month time with penalty. One external examiner and the Research Guide/Supervisor shall value the Dissertation. The external examiner should be University within Tamilnadu.

4.4.2 Part-II Credits

Paper	Evaluation	Marks	Credits
IV	Dissertation Evaluation	100	18

5. QUESTION PAPER PATTERN

The pattern of Question Paper will be easy type. The students should answer 5 out of 10 questions and each question will carry 20 marks.

6. CLASSIFICATION OF SUCCESSFUL CANDIDATES

The candidates who passed the Part-I and Part-II examinations in their first attempt shall be classified as follows.

1. 50% to 74%
2. 75% and above Highly commended

7. QUALIFICATIONS OF GUIDES FOR THE M.Phil COURSE

A Person eligible to be a Guide shall be required to possess a Ph.D. Degree or two years of Post-Graduate teaching experience after qualifying for M.Phil degree. He/ She

should have obtained recognition from the University. Change of guide may be permitted as per University norms.

8. ATTENDANCE

Daily attendance for 90 working days should be enforced for the students. Periodical report of to a student to the guide concerned should be recorded in the register kept by the guide. The broad area for the dissertation may be finalized at the beginning of the M.Phil Programme, so that the collection of relevant literature and research design could be completed in the First semester leaving the entire for the research work.

9. COURSE STRUCTURE

Paper Code	Title of the Paper	Contact Hours	Marks	Credits
PART-I				
Paper-I	Research Methodology	10	100	6
Paper-II	Recent Trends in Zoology	10	100	6
Paper-III	Field of Specialization	10	100	6
PART-II				
Paper-IV	Dissertation	-	100	18
TOTAL			400	36

M.Phil., ZOOLOGY - FRAMEWORK									
SEM	MAJOR / ELECTIVE	CODE	TITLE OF THE PAPER	CREDITS	HOURS /WK	TOTAL HOURS	CA	SE	TOTAL
I	Major I		RESEARCH METHODOLOGY	6	10	90		100	100
	Major II		RECENT TRENDS IN ZOOLOGY	6	10	90		100	100
			GUIDE PAPER FROM LIST OF ELECTIVES		10	90		100	100
	ELECTIVE			6					
TOTAL CREDITS FOR SEMESTER I									
					18				
II	MAJOR III		DISSERTATION & THESIS	6					100
TOTAL CREDITS FOR SEMESTER II									
					6				
COURSE CREDITS GRAND TOTAL				24					

PROGRAMME OUTCOMES (POs)

On completion of the Programme, the learner will be able to:

- PO 1** Apply professional knowledge
- PO 2** Identify abilities to motivate the students
- PO 3** Design skills to guide and mentor the future generation
- PO 4** Acquire immense knowledge of the subject
- PO 5** Demonstrate high quality skills

PROGRAMME SPECIFIC OUTCOME (PSOs)

On completion of M.Phil Zoology the student will be able to:

PSO 1	Categorize, investigate and synthesize scholarly literature and relating to the field of Zoology
PSO 2	Provide students with hypothetical background of important research concepts.
PSO 3	Understand the technical advances of computer technology and their usage.
PSO 4	Expose them to present and publish research papers in seminars, conferences and journals
PSO 5	To motivate them to take up research problems

M.Phil SYLLABUS

PAPER - I : RESEARCH METHODOLOGY

UNIT - I:

Identification , selection and scope of Research problem - Methods of literature collection and review - Planning execution of investigation - Manuscripts - Thesis writing - Research report - Tables - Figures - Formatting and typing . Experimental design - Abstract services - Reprints - preparation and presentation of research papers for journals symposia and conferences. Preparation of short communications and review articles. Bibliography - Working bibliography - Index cards and reference cards.

UNIT - II:

Principles of microtechniques - Fixation, Tissue processing - Microtomy (cryostat) Histological stains -Histochemistry - Fixatives, histochemical stains- Principle involved in identification of carbohydrates , proteins, lipids , enzymes and DNA. Microbial staining. Microscopes - Phase contrast, fluorescent microscopes, Electron microscopes-SEM, TEM- principles and Applications- Histological preparation of tissues for SEM and TEM. Photography- photomicrography - Principles and applications. Cytophotometry - Flow cytometry.

UNIT - III:

Separation techniques- Centrifuges-Ultra centrifuge - principle and techniques. chromatography- principles, types and applications-TLC, HPLC, GLC, Column and Ion exchange chromatography, Electrophoresis -principles, types and applications - Agar gel, PAGE, SDS - PAGE - GEL -documentation. Immunological techniques - Antigens and antibody - preparation and purification- ELISA, Blotting techniques - Southern blotting and western blotting - PCR techniques - Tracer techniques - application -Half life of isotopes - Autoradiography and its applications.

UNIT - IV:

Spectrophotometry - Principles and applications-Manometric techniques - ESR spectroscopy, calorimeter - Visual,UV -Atomic absorption spectrophotometer - Flame photometer - calorimetry - Wet combustion, Bomb calorimeter, X-Ray crystallography- Potentiometric techniques and circuit diagrams.

Electrical measurements - Electrical theory - Electronic system -Input transducers, Output transducers - power supply - Amplifiers.

UNIT - V:

Statistical methods and applications - sampling - Frequency distribution 't' test . Analysis of variance - one way , two way and multiple way of analysis - Regression and correlation coefficient- simple, linear and multiple correlation - simple, linear and multiple regression.

Computer Applications - Classification - Input and out put devices , CPU - software - systems and applications .Excel - spread sheet and statistical analysis using excel. Definition of operating systems of computers, Interpreters, Assemblers, loaders programmers, Algorithms, Flowcharting, coding, Debugging and Testing -CD-ROM, Internet websites.

REFERENCES:

1. Gurumani .N. Research Methodology for Biological Sciences.MJP publishers, Chennai.
2. Ralph. Methods in Experimental Biology.
3. Richard W.Van Norman, Experimental Biology.

COURSE OUTCOMES:

CO	CO STATEMENT
CO 1	Enhance students with investigative skills. Identify and apply the basic concepts of methods of Research
CO 2	Develop the important strategies of reading practices of journals and strengthen the research design
CO 3	Expose the techniques of data collection and for preparation of questionnaire and interviewing
CO 4	Understand the techniques of Report writing and for presentation

- CO 5 Knowledge of writing methods provides innovative ideas for preparing the summary and synopsis

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

PAPER II - RECENT TRENDS IN ZOOLOGY

UNIT - I:

Environmental degradation - causes and remedies - Acute and Chronic toxicity - organo chlorine, Organo phosphate and carbonate pesticide- LC 50, LD 50 , ED 50 assay - Detoxification- Environmental Impact Assessment - Environmental laws - Risk assessment - Environment education, planning and management - Bioremediation. Biofertilizers - composition - Biopesticide.

UNIT - II:

DNA sequencing and Human genome project, DNA finger printing and its applications, DNA amplification in PCR, Gene and cDNA library, Detection of genetic diseases using DNA recombinant technology, screening and counselling, Human gene therapy. DNA methylation, Antisense RNA, Transposons, Cell signalling. Cloning techniques and its applications in Biology - Ethical issues. Reproductive technology related to human invitro fertilization.

UNIT III

Somatic mutation and oncogenes – Induction of mutation by mutagens, teratogens and carcinogens. SCP – Production of sources. Methods involved in the production of transgenic animals and their uses. Production of recombinant insulin and growth hormone. Protein Engineering – Enzyme technology.

UNIT IV

Organization and expression of immunoglobulin gene. Vaccines – Whole organism vaccines, subunit vaccines, recombinant vaccines, DNA vaccines, Edible vaccines, Multivalent subunit vaccines – Development of AIDS and Malaria vaccines. Western Blot and Monoclonal antibodies in diagnosis of various diseases. HLA, tissue typing and organ transplantation.

Basic laboratory techniques for isolation, cultivation and cultural characterization of various microorganisms.

UNIT V

Environmental and social issues in coastal aquaculture – Hybridization – Development of polyploids – Chromosome manipulation. Gynogenesis and Androgenesis – Environmental and Nutritional Probiotics in the management of diseases. Cryopreservation of gametes and embryos. Bio informatics – Application – Genome and sequence analysis – Micro Array Database, Proteomics and Genomics. Space Technology – Significance and application in biology.

Nanotechnology – Definition and application in Biology, Medicine and in DNA research – Risks and Regulations.

Books for Reference

1. Attwood, T.K. and D.J. Parry – Smith., Introduction to Bioinformatics, Pearson Education Ltd., New Delhi.
2. Clarke, G.L. (1954). Elements of Ecology, John Wiley and Son Inc, New York, London. 53400.
3. Lohar P.S. Biotechnology, 2005 – MJP publishers, Chennai
4. Odum, E.P. (1983). Basic Ecology, Saunder's College publishing New York.
5. Pelczer M.J. (2000) Microbiology Mc graw Hill Book Company, New Delhi.
6. Sinnot E.W.L. C., Dunn and T. Dobzhansky, principles of genetics 1973 4th edition, Tata Mc Graw Hill pub. co. Ltd.
7. Weaver R.F. and Hedrick 1977., Genetics, W.H.C. Brown publishers – London.

CO CO STATEMENT

CO 1	To know the different types of pollutants and the toxicity
CO 2	To understand the principle, hereditary mechanism, structure and functions of genetic materials. Detection of genetic diseases
CO 3	Acquiring knowledge on SCP, oncology, techniques used in Biotechnology
CO 4	Gain knowledge on trans genesis, vaccines and transplantation
CO 5	Understanding aquaculture and the techniques for the production of hybrids. Application of Gene sequencing

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	2	3
CO3	3	3	3	2	3
CO4	3	3	3	2	3
CO5	3	3	3	2	3
AVERAGE	3	3	3	2	2.8

PAPER: III - INTERNAL PAPERS

BIOCHEMISTRY AND CELL BIOLOGY

UNIT – I

Membrane transport - Cell adhesion - cell communication - Intracellular junctions. Membrane receptors – Cell signaling through membrane surface receptors - Role of secondary messengers. Types of endoplasmic reticulum and its functions. Golgi complex – Role in cell storage and cell secretion. Lysosomes – Polymorphism in Lysosomes, peroxisomes, Biogenesis and functions of ribosome.

UNIT – II

Mitochondria biogenesis and mitochondrial replication – energetic of mitochondria. Nucleolus – Organisation and function of nucleolus – Nuclear receptors – Cell signaling through nuclear receptors. Cancer cell – Differences between normal and cancer cells – Membrane, biochemical, nuclear, chromosomal changes – Tumour progression – proto Oncogenes – Cellular oncogenes – tumour suppressor genes – Viral oncogenes – Environmental factors inducing cancer.

UNIT – III

Mechanism of transcription in prokaryotes – Terminators, Promoters and Initiators. Molecular mechanism of transcription in eukaryotes. RNA processing – Trimming of introns, Splicing and ribozyme. Reverse transcription – Reverse transcriptase. Protein synthesis – Mechanism of protein synthesis in prokaryotes – Translation in eukaryotes – Post translational process.

UNIT – IV

Amino acids – Structures classifications and functions. Peptides – Peptide bonds, Stereochemistry of peptide, Biological roles. Proteins – Structures, Classification, Properties of proteins. Enzymes – General properties, Classification, function and Nomenclature. Enzyme kinetics – Factors affecting enzyme action, Mechanism of enzyme action, Enzyme regulation.

UNIT – V

Carbohydrate – Structure, Classification and biological significance. Metabolism – 1. Glycogenesis 2. Glycogenolysis 3. Glyconeogenesis 4. Glycolysis – Embden – Meyerhof pathway, Hexose Monophosphate shunt. Bioenergetics – Role of ATP – Biological Oxidation, Respiratory chain and oxidative phosphorylation. Oxidation – Reduction reaction, redox potential in biological system.

CO

CO STATEMENT

- CO 1** To understand the cellular organization and function of different cell organelles
- CO 2** To know the importance of Mitochondria and nucleolus. To understand the differences between normal and cancer cells
- CO 3** To understand the processes involved in protein synthesis
- CO 4** To study the structure of amino acids and proteins. To understand enzyme kinetics
- CO 5** To gain complete knowledge of Carbohydrates

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	3	2	3	3	3
CO3	3	2	3	3	3
CO4	3	2	3	3	3
CO5	3	2	3	3	3
AVERAGE	3	2	3	3	3

FISHERY BIOLOGY
M.Phil optional paper syllabus

UNIT I

External morphology of teleost fish – Morphological, Morphometric and meristic characteristic of Taxonomic importance. Internal morphology of a Teleost fish – Digestive system and Reproductive system. Qualitative and Quantitative Analysis of Stomach content. Gonado somatic index.

UNIT II

Study of Major Carp (*Labeo rohita*, *Catla catla*, *Cirrhina mrigala*), Exotic carp, (*Cyprinus carpio*, *Hypothalamichthyes molitrix*, *Ctenopharyngodon idella*). Culture Practices – Mono culture and Polyculture – Extensive, Semi intensive and intensive.

UNIT III

Nutritional requirement of fishes. Feed – natural (Daphnia, Chaetoceros, Artemia) and formulated feed. Diseases of fishes (Bacterial, Fungal, helminthic and protozoan) and their treatment.

UNIT IV

Ornamental and Aquarium fish – Setting and maintenance of an aquarium, Aquarium fishes – Gold fish, Danio, Angel, Discus, Neon, Tetra, Red sword, Flower horn, Siamese Fighter). Other Cultivable organism. (*Lates calcarifer*, *Penaeus monodon*, *Scylla serrata*, *Pinctada vulgaris*).

UNIT V

Quality control – Post mortem changes – mechanism of spoilage. Process and preservation of fishes. Fish by products.

CO	CO STATEMENT
CO 1	Completely understand morphology, anatomy and physiology of fish
CO 2	To gain knowledge on different types of culture practices
CO 3	Types of fish feed. Diseases in fish caused by different microorganisms
CO 4	To gain knowledge on the ornamental fish and keeping aquarium
CO 5	Different process and preservation of fish

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	2	3
CO2	3	2	3	2	3
CO3	3	2	3	2	3
CO4	3	2	3	2	3
CO5	3	2	3	2	3
AVERAGE	3	2	3	2	3

MICROBIOLOGY

UNIT I :

Definition - droplet nuclei - aerosol - assessment of air quality - some important air borne diseases caused by bacteria, fungi, viruses their symptoms and preventive measures.

UNIT II :

Soil Microbiology: Physical and chemical characteristics and microflora of various soil types, rhizosphere - phyllosphere - brief account of microbial interactions - symbiosis - mutualism - commensalism - competition - amensalism - synergism - parasitism - predation. Biofertilizers - biological nitrogen fixation - nitrogenase enzyme - nif genes symbiotic nitrogen fixation - (Rhizobium, Frankia) - non symbiotic nitrogen fixation (Azotobacter - Azospirillum), VAM - ecto- endo ectendomycorrhizae. Major biogeochemical cycles and the organisms: carbon - nitrogen - Phosphorous and sulphur - a brief mention about biodegradation - xenobiotics - bioaccumulation - biopesticides - deterioration.

UNIT III :

Aquatic Microbiology: ecosystems - fresh water (ponds, lakes, Streams -- marine (estuaries, Mangroves, deep, sea), water zonations - upwelling - eutrophication - food chain, potability of water - microbial assessment of water quality - water purification - brief account of water borne diseases and preventive measures.

UNIT – IV:

Quality assurance in foods Foodborne infections and intoxications; bacterial with examples of infective and toxic types –, Clostridium, Salmonella, Shigella, Staphylococcus, Campylobacter, Listeria. Mycotoxins in food with reference to Aspergillus species. Quality assurance: Microbiological quality standards of food. Government regulatory practices and policies. FDA, EPA, HACCP, ISI. Unit –3 Food preservation methods

UNIT V :

Waste Treatment : Types of wastes - Characterization of solid and liquid wastes - wastes treatment and useful byproducts, Solid - Saccharification - gasification - composting - liquid waste treatment - aerobic - anaerobic methods.

CO	CO STATEMENT

CO 1	To assess the quality of air and to know the types of organisms involved in causing the different diseases
CO 2	To study the soil microorganisms and to know the advantages and disadvantages and their applications
CO 3	To understand the aquatic pollution and the effects
CO 4	Gain knowledge on the quality of food we consume
CO 5	Characterize the different types of wastes

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	3
CO2	3	3	2	3	3
CO3	3	3	2	3	3
CO4	3	3	2	3	3
CO5	3	3	2	3	3
AVERAGE	3	3	2	3	3

QUAID-E-MILLATH GOVERNMENT COLLEGE FOR
WOMEN
(AUTONOMOUS)

Anna Salai, Chennai – 600 002.

**DEPARTMENT OF ADVANCED ZOOLOGY AND
BIOTECHNOLOGY**

SYLLABUS

M.Sc. ZOOLOGY



CHOICE BASED CREDIT SYSTEM OUTCOME BASED EDUCATION

(Offered from the Academic year 2017 – 2018)

CONTENTS

1. Rules and regulations for the Programme
2. Programme Outcomes
3. Programme Specific Outcomes
4. Programme profile
5. Evaluation pattern of CA
6. Rubrics for CA Evaluation
7. Evaluation pattern for end semester
8. Course profile – semester I and II
9. Course profile – semester III and IV

Quaid-E-Millath Government College For Women (Autonomous)

Chennai - 600002

Post Graduate Courses

Choice Based Credit System

Quaid-E-Millath Government College for Women (Autonomous) offers the Semester System of education with credits for PG courses. Credit is related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures /tutorials /laboratory work /seminar /project work/ practical training/ viva voce etc to facilitate effective teaching and learning and the credits are assigned accordingly, depending on the content and the specialization.

The credit requirement for a two year PG course shall be 91(81 for core and elective & 10 credits for soft skill papers & internship)

REGULATIONS

1. Duration

a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semesters, the second academic year, the third and fourth semesters.

b. The odd semester shall consist of the period from June to November of each year and the even semesters from December to April of each year.

2. Course of Study

a. The course of study for Postgraduate Degree Courses shall comprise of Core courses & Electives.

b. System of Credits

3. System of credits

Year	No. of Papers				Marks	Credits				
	Core	Elective	Extra-Disciplinary Elective	Soft Skill		Core	Elective	Extra-Disciplinary Elective	Soft Skill	Internship
I Year	7	3	1	2	1300	28	9	3	4	2
II Year	4+1 Project Work	2	1	2	1300	32	6	3	4	
Total	12	5	2	4	2600	60	15	6	8	2

A candidate shall be declared to have passed in each paper / practical of the main subject of study wherever prescribed if she secures NOT LESS THAN 50% of the marks prescribed for the examinations. She shall be declared to have passed the whole examination, if she passes in all papers & practical's wherever prescribed as per scheme of examinations earning 90 credits.

4. Passing Minimum

A candidate shall be declared to have passed in each paper/practical of the Main subject of study wherever prescribed if she secures **NOT LES THAN 50%** of the marks prescribed for the examination.

5. Eligibility for the Award of degree

Candidate must secure a minimum of 50% marks in the Semester End Examinations. A candidate must secure 8 credits in soft skills and two credits in internship in addition to 81 credits from core and elective courses to obtain a Post Graduate Degree.

6. Ranking

Candidates who pass all the examinations prescribed for the course in the **FIRST APPEARANCE ALONE** are eligible for Classification/ Ranking/ Distinction.

7. Distribution of marks for Continuous Assessment

Test			Best 2 out of 3	Assignm ent	Seminar/ Creative Presentation	Model Exam	Attendance	Total	Reduc ed to
20	20	20	40	25	10	25	10	100	25

PATTERN OF QUESTION PAPER

TIME : 3 Hrs

MAX. MARKS : 75

SECTION A

K1

Answer any TEN out of TWELVE questions :

(10x2=20)

SECTION B

K2, K3

Answer any FIVE out of EIGHT questions:

(5x5=25)

SECTION C

Answer any THREE out of FIVE questions:

(3x10=30)

Program Outcomes (PO)

On completion of the Programme, the learner is able to:

- PO 1** Apply computational knowledge
- PO 2** Identify quality research
- PO 3** Design own curriculum to face competitive world
- PO 4** Acquire tremendous subject knowledge of the subject
- PO 5** Demonstrate quality skills

Program Specific Outcomes (PSO)

The Post Graduate students of Zoology should be able to

- PSO1** Relevant knowledge of core concept, understand the functional morphology and taxonomy of animals. Gain knowledge of cell organization, morphology, genetics, metabolic pathways and their applications.
- PSO2** Assess the application of statistic, physics and bioinstrumentation in zoology. Comprehend the principles of computational biology structural biology in zoology.

- PSO3** Understand the geological time scale and appreciate the process of evolution and divergence of animals and to have a keen awareness about the environment. Scientific explanation for Biodiversity, genetical and heredity concepts of life and analysing with developmental stages of animal with copious examples.
- PSO4** Set and do practices based on the laboratory standards in the areas of, Physiology, Ecology, Cell biology, Genetics, and Medical lab techniques. Become aware of microbial infection and immunological response in human health.
- PSO5** Grasp the significance of environmental issues and apply conservation techniques also to gain knowledge through research methodologies and communication skills. Apply the knowledge of fisher biology, sericulture, entomology and clinical nutrition in entrepreneurship practices.

Programme Profile

From 2017-2018

Credits and Marks Consolidation – M.Sc., Zoology

Subject Component	No. of Papers	Total Marks	Total Credits
Semester I			
Core Papers	3	300	12
Elective Papers	2	200	6
Soft Skill	1	100	2
Total	6	600	20
Semester II			
Core Papers	4	400	16
Elective	2	200	6
Soft Skill	1	100	2
Total	7	700	24
Semester III			
Core Papers	4	400	16
Elective Papers	2	200	6
Soft Skill	1	100	2
Internship			2

Total	7	700	26
Semester IV			
Core Papers	4	400	16
Elective Papers	1	100	3
Soft Skill	1	100	2
Total	6	600	21
Grand Total	26	2600	91

Frame Work

Distribution of Hours, Marks and Credits for M.Sc Zoology

Subject Code	Component	Title of the Paper	Credits	Hrs/Wk	Total Hrs	Ext	Int	Total
SEMESTER I								
176501	Core I	Functional Morphology and Systematics of Invertebrates	4	6	90	75	25	100
176502	Core II	Functional Morphology and Systematics of Chordates	4	6	90	75	25	100
176503	Core III	Lab Course I: Functional Morphology and Systematics of Invertebrates & Functional Morphology and Systematics of Chordates	4	6	90	75	25	100
176504	Elective I	Endocrinology	3	5	75	75	25	100
176505	Elective II	Clinical Nutrition and Dietetics	3	5	75	75	25	100
	Soft Skill I	Computing Skill	2			75	25	100
		Library		2				
		Total	20	30				

SEMESTER II								
176506	CORE IV	CELL AND MOLECULAR BIOLOGY	4	5	75	75	25	100
176507	CORE V	GENETICS	4	5	75	75	25	100
176508	CORE VI	BIOPHYSICS,BIOSTATISTICS AND BIOINSTRUMENTATION	4	5	75	75	25	100
176509	CORE VII	LAB COURSE II: CELL AND MOLECULAR BIOLOGY,GENETICS, BIOPHYSICS,BIOSTATISTICS AND BIOINSTRUMENTATION	4	6	90	75	25	100
176510	ELECTIVE III	RESEARCH METHODOLOGY	3	4	60	75	25	100
176510	EDP I	BIOPRODUCTS AND MARKETING	3	3	45	75	25	100
	SOFT SKILL II	LANGUAGE AND COMMUNICATION SKILL	2			75	25	100
		LIBRARY		2				
		TOTAL	24	30				

SEMESTER III								
176512	CORE VIII	DEVELOPMENTAL BIOLOGY	4	5	75	75	25	100
176513	CORE IX	IMMUNOLOGY & MICROBIOLOGY	4	5	75	75	25	100
176514	CORE X	ENVIRONMENTAL BIOLOGY AND BIODIVERSITY CONSERVATION	4	5	75	75	25	100
176515	CORE XI	LAB COURSE III: DEVELOPMENTAL BIOLOGY, IMMUNOLOGY, MICROBIOLOGY, ENVIRONMENTAL BIOLOGY .	4	5	75	75	25	100
176516	ELECTIVE IV	APPLIED ENTOMOLOGY	3	5	75	75	25	100
176517	EDP II	BIOINFORMATICS	3	3	45	75	25	100
	SOFT SKILLS -III	SPOKEN ENGLISH	2			75	25	100
		LIBRARY		2				
	**	INTERNSHIP	2			75	25	100
		TOTAL	26	30				

SEMESTER IV								
176518	CORE XII	ANIMAL PHYSIOLOGY & BIOCHEMISTRY	4	6	90	25	75	10
176519	CORE XIII	EVOLUTION AND ANIMAL BEHAVIOR	4	6	90	25	75	10
176520	CORE XIV	LAB COURSE IV: ANIMAL PHYSIOLOGY, BIOCHEMISTRY , TAXONOMY, EVOLUTION AND ANIMAL BEHAVIOUR	4	6	90	25	75	10
176521	CORE XV	PROJECT AND PROJECT VIVA	4	5	75	25	75	10
176522	ELECTIVE V	FISHERY BIOLOGY	3	5	45	25	75	10
	SOFT SKILLS -IV	LIFE AND MANAGERIAL SKILL	2			25	75	10
		LIBRARY		2				
		TOTAL	21	30				

EVALUATION PATTERN FOR CONTINUOUS ASSESSMENT-UG

INTERNAL VALUATION BY COURSE TEACHER/S

PART I, II AND III-THEORY PAPERS

COMPONENT	TIME	MAX.MARKS	CAMARK
1.TEST I	1 HRS	20 MARKS(TO BE CONVERTED)	20
2. TEST II	1 HRS	20 MARKS (TO BE CONVERTED)	20
3.ASSIGNMENT/SEMINAR/FIELD VISIT			25
4. MODEL EXAMINATION			25
5..ATTENDANCE			10
TOTAL			100

PART III- PRACTICAL PAPERS

COMPONENT	MARKS		
1.TEST I	1 HRS	20 MARKS(TO BE CONVERTED)	20
2. TEST II	1 HRS	20 MARKS (TO BE CONVERTED)	20
3. RECORD/OBSERVATION			25
4. MODEL EXAMINATION			25
5.ATTENDANCE			10
TOTAL			100

CA QUESTION PAPER PATTERN-PG

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-2X2 marks	50	04	20
K1, K 2	B-1/1x6marks	200	06	
K2, K 3	C-2/2x10 marks	500	10	

RUBRICS FOR CONTINUOUS ASSESSMENT

S.No.	Component	Criteria
1	Assignment	Content Originality Presentation Schematic Representation Diagram Bibliography
2	Seminar	Organisation Subject Knowledge Vidual Aids Confidence level Presentation Communication Language
3	Field Visit	Participation Preparation Attitude Leadership

4	Participation	Answering Questions Clearing Doubts Participating in Group Discussions Regular Attendance

END SEMESTER EVALUATION PATTERN – P.G., THEORY PAPERS

SEMESTER I/II/III/IV

DOUBLE VALUATION BY COURSE TEACHER AND EXTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARKS : 38

PRACTICAL PAPERS

SEMESTER I/II/III/IV

VALUATION BY EXTERNAL EXAMINER AND INTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARK : 38

SOFT SKILLS PAPERS

SEMESTER I/II/III/IV

SINGLE VALUATION BY INTERNAL EXAMINER

MAXIMUM MARKS : 60

PASSING MARKS : 30

PROJECT PAPER

SEMESTER IV

DOUBLE VALUATION BY RESEARCH SUPERVISOR AND EXTERNAL EXAMINER
DISSERTATION : 75

VIVA-VOCE:25
 MAXIMUM MARKS : 100
 PASSING MARKS : 50

INTERNSHIP

YEAR II

SEMESTER IV

MAXIMUM MARKS : 100

PASSING MARKS : 50

Distribution of Marks for Continuous Assessment

Part I, Part II & Part III – Theory

Test			Best 2 out of 3	Assignment / seminar		Assignment on Glossary	Model Exam	Attendance	Total	Reduced to
1	2	3		1	2					
20	20	20	40	10	10	5	25	10	100	25

Test (Best two out of three) : 40 Marks
 Assignment / Seminar 2 x 10 : 25 Marks
 Model Examination 80 / 8 : 25 Marks
 Attendance : 10 Marks

 100 Marks (reduced to 25)

Attendance:

90% & above 10 Marks

80 % & above 9 Marks

75 % & above 8 Marks

65 % & above 7 Marks with condonation

[condonation – Theory and Practicals – separately]

50% to 65 % - To skip the examination of that year and can write the exam in the next semester/year – 5 Marks

Below 50 % - Has to repeat the semester after the completion of the course.

End Semester Examination:

Question Paper Pattern:

Section A : 10 x 2 = 20 Marks

Section B : (5 out of 8) x 5 = 25 Marks

Section C : (3 out of 5) x 10 = 30 Marks

Total : 75 Marks

Practical Papers:

Class test (3)	:	30	Marks
Observation	:	10	Marks
Model examination	:	25	Marks
Attendance	:	10	Marks
		75	Marks (reduced to 25)

SEMESTER –I**CORE - I****FUNCTIONAL MORPHOLOGY AND SYSTEMATIC OF INVERTEBRATES****Total Hrs: 90****Credits: 4****Course Objectives**

1. To comprehend the systematic position and functional morphology of Invertebrates.
2. To understand their mode of life and adaptations.
3. To study the biodiversity of invertebrates.

UNIT I:

Protozoa: Animal organization – symmetry and its significance and Polymorphism. **Porifera:** Phylum – Mesozoa, Interrelationship between deep sea and fresh water sponges, **Coelenterata:** Cnidaria: Origin and evolution of metazoan, Polymorphism, defensive structures and their mechanism, metagenesis, Ctenophora: Structural peculiarities and affinities. -

25 hrs

UNIT II:

Origin of Bilateria: Importance of Rhabdocoela as a stem group. Origin and evolution trends in coelom formation. Theories on origin of metamerism. **Platyhelminthes:** Functional morphology and adaptive biology for parasitic mode of life.
-15 hrs

UNIT III:

Annelida: Interrelationship between classes of annelid, Coelom and metamerism; modes of life in polychaetes; Archiannelida. **Arthropoda:** Phylogeny of Arthropoda, Structure and affinities of Xiphisura, metamorphosis in insect and its hormonal regulation, social behaviour of Apis and termites. -

15 hrs

UNIT IV:

Mollusca: Phylogeny of Mollusca, Monoplacophora, torsion and detorsion in gastropods, Adaptive radiation in Mollusca. **Echinodermata:** Phylogeny and evolution, Coelom and Coelomocytes, Water Vascular System.
-15 hrs

UNIT V:

Minor Phyla: Structural affinities and life history of Rotifera, Entoprocta, Phoronida, Brachiopoda and Ectoprocta. **Invertebrate Fossils:** Trilobites, Brachiopoda, Cephalopoda and Echinodermata.

-20
hrs

Books for Reference

1. Barnes R. D. (1982) Invertebrates Zoology 6th endn. Toppan International Co.,
2. Hyman L.H. (1940 - 1959). The Invertebrata, Vol. I to VI.
3. Carter, G. S. A. (1946) General Zoology of Invertebrates 2nd endn. (Wick and Jackson Ltd., London).
4. Borradile, L.A. (1955) The Invertebrata. 2nd endn. Cambridge University Press.
5. Barrington, E. J. W. (1969) Invertebrate Structure and functions. English Language. Book Society.
6. Kotpal, R.L. (1982) Protozoa, Porifera, Coelenterata, Helminthes, Annelida, Arthropoda, Mollusca, Echinodermata and Minor Phyla. Rastogi Publications.

7. Moore, R. C. Lalicker, C. G. and Fisher, A. G. (1952) Invertebrate Fossils, Mc. Graw Hill Book Co., New York.
8. Gardinar, M.S. 1972 Biology of the Invertebrates, Mc Graw Hill Book Co., New York.

List of Journals

1. Invertebrate Systematics - CSIRO PUBLISHING
2. Invertebrate Phylogeny | Science
3. Life history evolution of marine invertebrates: New views from
4. Invertebrate Biology - Wiley Online Library

List of Websites

1. <https://www.publish.csiro.au> > .
2. <https://science.sciencemag.org> > content
3. <https://www.cell.com> > trends > ecology-evolution > full text
4. <https://onlinelibrary.wiley.com> > journal

Course Outcome

Upon completion students should be able to

- CO1** understand the symmetry, organization, polymorphism and defence in unicellular to triploblastic organisms.
- CO2** comprehend the theories on coelom formation, mesmerism in evolutionary trends
- CO3** interpret the relation between the major invertebrate phyla by hormonal regulations in metamorphosis.
- CO4** appreciate the unique adaptations of aquatic invertebrates of higher order.
- CO5** realise the significance of invertebrate fossils and minor phyla.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	1
CO2	3	3	2	2	1
CO3	3	3	3	1	3
CO4	3	3	3	2	2
CO5	3	3	2	2	2
AVERAGE	3	3	2.4	1.8	1.8

SEMESTER –I
CORE- II
FUNCTIONAL MORPHOLOGY AND SYSTEMATIC OF CHORDATES
Total Hrs: 90
Credits: 4

Course Objectives:

1. To comprehend the systematic position and functional morphology of chordates.
2. To understand their mode of life and adaptations.
3. To study the biodiversity of chordates.

UNIT:I TAXONOMY

Principles of Taxonomy: Nomenclature: Binomial, Trinomial nomenclature. Suffix as for super family name (oidea), family name (idea). Use of suffixes 'T' 'Orum' 'ae' 'arum' 'iensis'. Tautonyms, Synonyms, and Homonyms. New trends in taxonomy: Ecological approach, Ethological approach, Cytological approach, Biochemical approach, Numerical Taxonomy, Molecular Taxonomy and Phylocode. Taxonomic keys: Indented, simple non - Bracket Grouped type, combination, Pictorial- Branching type, Circular and Box - type.

-20 hrs

UNIT II :

Phylogeny of Prochordates and Chordates. Systematic position of Prochordates and chordates and their general characters. Ostracoderms: Origin, evolutionary position, organization and affinities of ostracoderm. Placoderms: origin of jaws, evolution of jawed vertebrates, structural peculiarities of Cyclostomes.

-20 hrs

UNIT III :

Chondrichthyes Fossil history and general account of Elasmobranchii, Holocephalii, Dipnoi and Crossopterigii. **Actinopterygii:** origin and evolution, adaptive radiation in bony fishes, accessory respiratory organ in fishes. **Amphibia:** Origin and evolution of Amphibia.

- 20 hrs

UNIT VI:

Reptilia:origin and evolution of Reptiles, Skull in reptiles-Arcade & Fossae, Saurischian and Ornithischian Dinosaurs. Rhyncocephalia. Golden age of reptiles. **Aves :**Origin and evolution , Birds as glorified reptiles -fossil evidences, Palate in birds, adaptive radiation in birds, Aerodynamics and energetic of flying.

-15 hrs

UNIT V:

Mammals: Origin and evolution in mammals, structural peculiarities of Prototheria, Metatheria and Eutheria, aquatic adaptation in mammals. **Comparative anatomy:** Origin and evolution of the vertebrate integumentary system, paired fins and limbs, heart, urinogenital system , aortic arches, Jaw suspension and brain in vertebrates.

-15 hrs

Books for Reference

1. Waterman. A.J. 1971. Chordate Structure and Function. McMillan Co. London.
2. Jolie, M. 1968. Chordate Morphology. East West Press. Pvt, Ltd,
3. Romer, A.S. and Parson, T.S. 1978 Vertebrate Body. W.B. Saunders Co., Philaelpia.
4. Young, J.2.1969. Life of Vertebrates. Clarendon Press, Oxford.

5. Colbert, E.H. 1969. Evolution of Vertebrates. John Wiley and Sons Inc, New York.
6. Holstead. 1969 The Pattern of Vertebrate Evolution. Freeman and Co. San Francisco. U.S.A.
7. Hobart M. Smith, 1960 Evolution of Chordate Structure, Holt, Rinehart and Winston. Inc. New York.
8. Kapoor, V.C. 1998 Theory and Practice of Animal Taxonomy. Oxford and IBH Publishing Co., Pvt, Ltd. New Delhi.
9. Hyman, L.H. 1966. Comparative Vertebrate Anatomy. The University of Chicago Press, Chicago.
10. Carter, G.S.A. 1969. General Zoology of Invertebrates. Sidewick and Jackson Ltd., London
- 11 R.L. Kotpal. The Birds. Rastogi Publications.
12. V.C. Kapoor. Theory and Practice of Animal Taxonomy. Oxford and IBH Publishing Co., Pvt. Ltd, New Delhi

List of Journals

1. Chordate evolution and the three-phylum system
2. Evolution and Development of the Chordates - Oxford Journals
3. Origin of Chordates - BioScience.pk

List of Websites

1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4211455>
2. <https://academic.oup.com/mbe/article>
3. <https://www.bioscience.com.pk/Topics/Zoology>

Course Outcome

Upon completion students should be able to

- CO1** understand the principles of taxonomic keys for nomenclature and systematics.
- CO2** appreciate the origin and position of prochordates and chordates.
- CO3** comprehend the evolution and ancestry of fish and amphibians.
- CO4** appreciate the origin , evolution and adaptations of reptiles and birds.
- CO5** understand the origin , evolution and comparative adaptations of mammals.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	3	2	2
CO4	3	3	3	2	2
CO5	3	3	3	2	2
AVERAGE	3	3	3	2	2.4

SEMESTER – I CORE - III

(LAB COURSE – I)

**FUNCTIONAL MORPHOLOGY AND SYSTEMATICS OF INVERTEBRATES &
FUNCTIONAL MORPHOLOGY AND SYSTEMATICS OF CHORDATES**

Total Hours: 90

Credits: 4

Course Objectives:

1. To study the structural organisation of Invertebrates and chordates.
2. To compare the anatomical features of invertebrates and chordates.
3. To understand the role of evolution in speciation.

ANIMAL DIVERSITY

DISSECTIONS:

Dissection of digestive system of Gryllotalpa and Pila/ sepia

Dissection of nervous system of Gryllotalpa , Pila/ sepia

Dissection of reproductive system of Gryllotalpa and Pila/ sepia.

Dissection of Aortic arches in any fish.

MOUNTINGS:

Gnathochilarium of Millipede

Sting of Honey bee

Pedicellaria of Sea urchin

Aristotle's lantern of Sea urchin

Brain of chick

Identification of scales

Otolith of fish.

SPOTTERS:

Invertebrates

1. Identification and study of selected Protozoans and Helminths of medical importance.

Entamoeba histolytica, Plasmodium vivax, Trypanosoma gambiense, Leishmania donovani, Taenia solium, Ascaris lumbricoides, Enterobius vermicularis, Ancylostoma duodenale, Wuchereria bancrofti, Trichinella spiralis.

2. Identification and study of sections of certain animals to understand the evolution of different types of coelom.

Acoelomata - T.S of Taenia solium , Pseudocoelomata - T.S of Ascaris, Coelomata - T.S of leech.

3. Identification and study of larval forms from all major phyla of Invertebrates.

Ephyra Larva, Miracidium Larva, Cercaria Larva, Redia Larva, Nauplius Larva, Zoea Larva, Megalopa Larva, Mysis Larva, Muller's Larva ,Veliger Larva, Auricularia Larva, Glochidium Larva, Bipinnaria Larva , Ophiopluteus Larva , Echinopluteus Larva.

4. Study of prepared slides of mouth parts of insects to relate structure and function

Honey bee, Housefly, Mosquito, Bed bug and Butterfly.

Chordates

1. Study of the following specimens to bring out their affinities:

a)Amphioxus, b)Balanoglossus, c)Ascidian, and d)Petromyzon

2. Study of the following specimens with Reference to their adaptive features for their respective modes of life.

a)Echeneis, b)Hyla, c)Draco, d)Pigeon, e) Bat

3. Study of the following skull types with Reference to jaw suspensions:

a)Fish, b) Frog, c) Calotes, d) Rat / Rabbit

Practical record to be submitted during the practical examination.

Course Outcome

Upon completion students should be able to

CO1 have hands on experience on animal dissection.

CO2 compare the system of functioning in different animals.

CO3 understand the diversity among animal groups.

CO4 trace the origin, evolution and diversity in traits.

CO5 disseminate information on animal life

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	1
CO2	3	3	2	3	2
CO3	3	2	3	3	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	2.8	2.6	2.8	2.2

SEMESTER - I
ELECTIVE - I
ENDOCRINOLOGY

Total Hours : 75

Credits: 3

Course Objectives

1. To study the structure, function of hormones.
2. To study the biosynthesis and pathways of hormones.
3. To understand the interaction and role of hormone

UNIT I:

Organization of the Endocrine System, Hormone Secretion (apocrine, holocrine, Mero Crine Hormones feedback in homeostasis. Hormone – Receptor interaction – Down regulation of Receptor Up regulation of Receptors- Intercellular signaling after hormone – receptor of activation ion channel linked receptor. G-protein linked hormone receptor, Enzyme linked hormone receptor, intercellular hormone receptor second messenger mediating hormonal functions.

15 hrs

UNIT II:

Structure and synthesis of protein hormones and Steroid hormone and clearance from blood. Hypothalmo – hypophysial system, Neurohypophysial octapeptides (Hypophysiotropic hormone: Chemistry localization and Adenohypophysial hormones. Chemistry and physiological roles of some somatotrophin and prolactin)

15 hrs

UNIT III:

Hypothalamic releasing and inhibiting hormones, Glycoprotein hormones (FSH, LH, TSH). Pro-opiomelanocortin (ACTH, MSH, B-LPH, B-endorphin), Abnormalities of growth hormones secretion, Disorders of posterior Pituitary hormone, thyroid gland and bio-synthesis of thyroid hormones diseases caused due to hyper and hypo thyroidism -
15 hrs

UNIT IV:

Steroid hormones biosynthesis and pathways Testes – Organization – Physiological roles of androgen ovary – Organization physiological roles of Oestrogen, Progesterone and relaxin, Female Physiology before pregnancy, role of hormone during pregnancy, role of hormones in parturition and lactation.

- 15 hrs

UNIT V:

Adrenal Cortex and Adrenal Medulla Organization – Control of mineralcorticoid and glucocorticoid secretions- physiological roles of glucocorticoid and mineralocorticoid – Adrenal medulla: catecholamine biosynthesis, release and its physiological roles. Role of parathormone: calcitonin and Vitamin D in calcium homeostasis – Endocrine pancreas: biosynthesis and physiological actions of insulin and glucagon.

- 15 hrs

Books for Reference

1. Textbook Of Endocrinolog – 2010 by [Dharmalingam](#)
2. Introduction to Endocrinology Paperback – 2009
by [Negi](#) (Author), [Chandra S](#)
3. [Williams Textbook of Endocrinology 13th Edition](#)
by Shlomo Melmed Kenneth Polonsky P. Reed Larsen Henry Kronenberg

List of Journals

1. Journal of Endocrinology
2. Endocrinology
3. Indian Journal of Endocrinology and Metabolism : Free full text
4. Endocrine – Springer
5. Endocrine Journal

List of Websites

1. www.ijem.in
2. <https://www.springer.com> › medicine › internal › journal
3. <https://www.scimagojr.com> › journalsearch
4. <https://en.wikipedia.org> › wiki › Endocrine_(journal)

Course Outcome

Upon completion students should be able to

- CO1** understand the hormone signalling system, enzyme linked hormone receptor and their functions.
- CO2** comprehend the chemistry, synthesis of proteins and steroids and their role.
- CO3** realise the hypothalamic hormones and the deficiency symptoms.
- CO4** grasp the role of hormones associated with pregnancy and lactation.
- CO5** grasp the adrenal corticoids and their role

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	2
CO2	3	3	3	3	3
CO3	3	2	2	3	1
CO4	2	2	3	3	3
CO5	2	1	2	2	2
AVERAGE	2.6	2.2	2.4	2.8	2.2

SEMESTER - I
ELECTIVE - II

CLINICAL NUTRITION AND DIETETICS

Total

Hours : 75

Credits: 3

Course Objectives

1. To study the dietary managements.
2. To understand the management of lifestyle diseases by diet.
3. To study nutrition associated diseases

UNIT I

Introduction, Principles of Healthy Nutrition, Therapeutic diet – types and qualities.
-10hrs

UNIT II

Weight Management and Eating Disorders - Obesity and Underweight, causes and dietary management. Nutrition and Anemia's
-15hrs

UNIT III

Diabetes - Types, Symptoms, Causes and dietary management.
Hypertension and Cardiovascular Diseases, Symptoms and Dietary management.
-15hrs

UNIT IV

Diseases of gastro Intestinal tract- Gastric and duodenal Ulcer, Diarrhea, Constipation and dietary management.
-15hrs

UNIT V

Typhoid, Jaundice, Malaria, dengue, Chikungunya – symptoms and dietary management.
-20hrs

Books for Reference

1. Srilakshmi, B. Dietetics, New Age International (P).
2. Paul. S. Text book of Bionutrition curing diseases through diet. CBS Publications
3. Clinical Dietetics and Nutrition by Antia F P
4. Oxford Handbook of Nutrition and Dietetics (2 ed.)
Edited by Joan Webster-Gandy, Angela Madden, and Michelle Holdsworth

List of Journals

1. Journal of Nutrition
2. Journal of Nutrition and Dietetics
3. Journal of the Academy of Nutrition and Dietetics
4. Journal of Human Nutrition and Dietetics - Wiley Online Library

List of websites

1. <https://www.omicsonline.org › journal-nutrition-dietetics>
2. <https://www.journals.elsevier.com › journal-of-the-academy-of-nutrition-a>.
3. <https://onlinelibrary.wiley.com › journal>
4. <https://onlinelibrary.wiley.com › journal>

Course Outcomes

Upon completion students should be able to

- CO1 understand the basic principles of healthy nutrition.
- CO2 comprehend weight management and eating disorders.
- CO3 grasp dietary management for lifestyle diseases.
- CO4 realise gastrointestinal diseases.
- CO5 distinguish between waterborne and vector borne infections.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	2	3	3	3
CO4	3	2	2	3	3
CO5	2	2	2	2	2
AVERAGE	2.8	2.4	2.6	2.6	2.8

SEMESTER II

CORE PAPER - IV

CELL AND MOLECULAR BIOLOGY

Total Hours:

75

Credits: 4

Course Objectives

1. To study the organization of animal cell and organelles.
2. To learn the importance of cell cycle and its regulations.
3. To study the mechanism of transfer in pro and eukaryotic cell

UNIT I: STRUCTURE AND FUNCTIONS OF CELL ORGANELLES

Structure of eukaryotic cell - Animal cell. Plasma membrane: Composition and structure - Membrane transport – Cell adhesion – Cell Communications - Intercellular junctions. Membrane receptors- Cell signaling through membrane surface receptors – Role of second messengers. Types of endoplasmic reticulum and functions. Golgi Complex –Role in Cell storage and Cell secretion. Lysosomes – Polymorphism in lysosomes, Peroxisomes. Biogenesis and functions of ribosomes.

- 15 hrs

UNIT II: MITOCHONDRIA AND NUCLEUS

Mitochondria - Biogenesis and mitochondrial replication- Energetics of mitochondria. Nucleolus- Organization and functions of Nucleolus- Nuclear receptors- Cell signaling through nuclear receptors. Nuclear transplantation - Cell fusion: homokaryons and heterokaryons Cytoplasts and Karyoplasts. Ultra Structure and Chemical composition of Chromosomes- Histones- Organization of Nucleosomes - Euchromatin and heterochromatin - Giant chromosomes (Polytene and lampbrush)

- 15 hrs **UNIT III: CELL CYCLE AND**

CANCER BIOLOGY

Cell cycles- Molecular events and its regulation. Chromosome movements - Spindle organization- Regulation of cell division and synchronization of cell division. Cancer cell: Differences between normal and cancer cell - Membrane , biochemical, Nuclear, chromosome changes - Tumor progression - Proto Oncogenes – Cellular oncogenes- Tumor suppressor genes- Viral oncogenes - Environmental factors inducing cancer .

-10 hrs

UNIT IV: INFORMATION MACROMOLECULES

Molecular structure of DNA – Polymorphism of DNA (A,B and Z forms). Semiconservative replication of DNA- Mechanism and enzymology of DNA replication in eukaryotes- Role of helicases, primases, Topoisomerases, gyrases, endonucleases and telomerases in replication - DNA repair mechanisms. Molecular structure of RNA- Different of types of RNA and their functions.

-

20 hrs

UNIT V: INFORMATION TRANSFER IN PROKARYOTE AND EUKARYOTES

Mechanism of transcription in Prokaryotes –Terminators, Promoters and Initiators. Molecular mechanism of transcription in Eukaryotes. - RNA processing –Trimming of introns, Splicing and Ribozyme.. Reverse transcription- Reverse transcriptase. Protein synthesis- Mechanism of protein synthesis in prokaryotes – Translation in Eukaryotes - Post translational processing.

-15 hrs

Books for Reference

1. De Robertis, E. D.F. and De Robertis. E. M. F., (1981). Cell and Molecular Biology. Saunder International Edition.
2. Brachet, J. and-Mirsky. A. E., (1967). The cell (all volumes). II Edition, Academic Press, New York.
3. Ambrose, E. J; and Dorothy. M. E., (1979) Cell Biology. II edition. The English language. Book Society.
4. Albert. B and Watson. J. D., (1990) Molecular Biology of the Cell. Garland Publishing. London.
5. Darrtell. J., Lodish, H. and Baltimore, D., 1992. Molecular Cell Biology. Scientific American Books.

List of Journals

1. Molecular and Cell Biology
2. Journal of Cell and Molecular Biology
3. Molecular Biology of the cell
4. Nature Cell Biology
5. Journal of Molecular Biology-Elsevier

List of Websites

1. <https://www.omicsonline.org> › *cellular-and-molecular-biology*
2. <https://mcb.asm.org>
3. <https://www.journals.elsevier.com> › *journal-of-molecular-biology*
4. <https://academic.oup.com/jmcb>

Course Outcome

Upon completion students should be able to

- CO1 understand the functions of cell organelles.
- CO2 comprehend the cell signalling through membrane surface receptor.
- CO3 grasp the role of cell cycle in cancer biology.
- CO4 realise the molecular structure and types of nucleic acids.
- CO5 grasp the information transfer in cells

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	2	3	1	3	2
CO3	3	2	2	3	3
CO4	2	2	2	3	3
CO5	3	2	2	2	1
AVERAGE	2.6	2.4	2	2.8	2.4

SEMESTER II
CORE PAPER V
GENETICS

Total Hours:
75
Credits: 4

Course Objectives

1. To study the basic concepts of genes.
2. To learn the regulations of gene expressions.
3. To understand genetic disorder

UNIT I: MOLECULAR AND MICROBIAL GENETICS

Gene Concept - Fine Structure of the gene (cistron, muton, recon, replicon) - one gene one polypeptide concept. Identification of DNA as genetic material-Experimental evidences. Chromosome mapping .Microbial Genetics - Conjugation, transformation, transduction and sexduction.

-15 hrs

UNIT-II: REGULATION OF GENE EXPRESSION

Regulation of gene expression-.Gene regulation in prokaryotes- LAC and GAL - Operon system- Regulation of gene expression in Eukaryotes. Genes and metabolism- Inborn errors of metabolism in man (with reference to protein, carbohydrate, lipid and nucleic acid metabolism).

-10 hrs

UNIT III: SEX CHROMOSOMES AND GENETIC DISORDERS

Sex Determination. Evolution of sex chromosomes, Dosage compensation – X-inactivation. Genomic imprinting. Human Genetics - Normal human karyotype - Variations in Karyotypes (Autosomal and sex chromosomal - structural and numerical) with special reference to classical syndromes in Man. Principles and methods of pedigree analysis. Genetic Counselling - Objectives, ethics and principles. Methods of counselling.

-15 hrs

UNIT IV: RADIATION GENETICS

Chromosomal aberrations -Mechanism of chromosomal breakage - physical, chemical and biological agents. Molecular basis of mutation- Mutagens - mutagenesis and carcinogenesis
Gene activation in neoplasia- Genetic changes in Neoplasia in man.
-15 hrs

UNIT V: POPULATION GENETICS AND APPLIED GENETICS

Population genetics - Population and gene pool. Hardy-Weinberg Law - genetic equilibrium. Calculation of gene frequencies for Autosomal (Complete dominance, incomplete dominance and multiple alleles) and sex linked genes. Factors affecting Hardy - Weinberg equilibrium
Applied Genetics - Application of genetics in plant and animal breeding. Application of genetics in Crime and Law -. Genetic basis of intelligence. Studies on twins. Genetics and Society: Eugenics, Euphenics and Euthenics.
- 20 hrs

Books for Reference:

1. Watson. J.D. (1980) Molecular Biology of the Gene, W. A. Benjamin and, Company, New York.
2. Sinnot. E. W., Dunn. L. C., Dobzansky, T. H. (1958) Principles of Genetics, McGraw Hill Co., New York.
3. Burns, G. W. (1969). The Science of Genetics, the McMillan Company, New York.
4. 5. Ayala, F. J. & Kieger, J. A. Jr. (1980) Modern Genetics, The Benjamin Publishing Co., Inc.
6. 7. Curs Sten (1973) Principles of human genetics, W. H. Freeman and Co.,
- 8.. Gardner, (1984) Principles of Genetics, 7th edn. Wiley private Limited, New Delhi.

List of Journals

1. Journal of Genetics
2. Journal of Genetics and Genomics – Elsevier
3. Journal of Genetics - Springer
4. Frontiers in Genetics
5. Journal of Human Genetics - Nature

List of Websites

1. <https://www.journals.elsevier.com › journal-of-genetics-and-genomics>
2. <https://link.springer.com › journal>
3. <https://www.frontiersin.org › journals › genetics>
4. www.nature.com › jhg
5. <https://www.genetics.org>

Course Outcome

Upon completion students should be able to

- CO1 understand the structure and functions of gene.
- CO2 grasp the role of gene regulation and operon concept.
- CO3 comprehend the chromosome related disorders.
- CO4 realise the role of mutation in cancer.
- CO5 appreciate the laws and applications in genetics.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	2
CO2	3	2	2	3	2
CO3	3	3	3	3	3
CO4	3	3	2	3	3
CO5	3	3	3	3	3
AVERAGE	3	2.8	2.6	3	2.6

SEMESTER II
CORE PAPER VI
BIOPHYSICS, BIOSTATISTICS AND BIOINSTRUMENTATION

Total Hours: 75
Credits: 4

Course Objectives

1. To learn the applications of basic laws of physical science.
2. To study the applications of statistics in biology.
3. To learn the principals of basic instruments involved in biolog

BIOPHYSICS

UNIT I

Electron configuration of an atom Bonds – covalent bond, Hydrogen bond, Disulphide bond, Peptide bond. Forces between molecules – Electron force, Vander Waal's forces – hydrophobic and hydrophilic. Bioenergetics: Laws of Thermodynamics – Concept of free energy and entropy and enthalpy.
-15hrs

UNIT II

Diffusion – Fick's law, diffusion coefficient and biological significance. Osmosis: Osmotic concentration, Osmotic pressure – Vant Hoff's law. Radiation Biophysics: Iosnising radiation,

Unit exposure and dose. Effects of radiation - somatic and Genetic. Applications of Radiative isotopes and tracers.
-15hrs

BIOSTATISTICS

UNIT III

Graphical representation of data – Bar diagram, Histogram, Scatter plot, Pie Chart. Discrete and continuous variable. Mean (Calculation for individual, discrete and continuous frequency), Definition of median and mode. Standard Deviation (Calculation for individual, discrete and continuous frequency), Variance and standard Error.
-15hrs

UNIT IV

Simple Correlation, Regression, Basic concepts of Probability. Concepts of Hypothesis and Hypothesis Testing. Test for Goodness of Fit Chi square Test. Students t Test for comparing mean for two samples from normal Population. -
15hrs

BIOINSTRUMENTATION

UNIT V

Principle and application of Light and Electron Microscope, pH Meter. colorimeter, Spectrophotometer, Centrifuge (Clinical and Ultra centrifuge), Chromatography (partition and adsorption), Electrophoresis (PAGE). -
15hrs

Books for Reference

BIOPHYSICS

1. Bose, S. 1982. Elementary Biophysics, Jyothi Books
2. Buns, D.M. & MacDonald, S.G.G. 1979. Physics for Biology and remedical students. ELBS and Assission – Wesley Publishers Ltd., London.
3. Casey, E.J. 1962. Biophysics concepts and Mechanism. Affiliated East Press Pvt. Ltd New Delhi.

4. Das, D. 1982. Biophysics and Biophysical Chemistry. Academic Publishers, New Delhi.
5. Epstein, H.T. 1963. Elementary Biophysics and selected topics. Assission – Wesley Publishing Compan7y Inc. London.
6. Papanichamy S. and Shanmugavelu, M. (1991). Principles of Biophysics. Palani Paramount Publication, T.N.

Books for Reference

1. Gurumani, N. (2005) Biostatistics, 2nd edn. MJP publications, India.
2. Milton, J.S. (1992) Statistical method in Biological and Health Sciences. McGraw Hill Inc., New York.
3. Schefler, W. C. (1968) Statistics for biological sciences, Addison- Wesley Publication Co., London.
4. Snedecor, G. W and Cocham, W.G. (1967) Statistical Methods. Oxford & IBH Publication co., New Delhi.
5. Spiegel, M.R (1981) Theory and problems of statistics, Schaum's Outline series McGraw-Hill International Book Co., Singapore.
6. Pillai, R.S.N and Bagawathi, V. (1989), Statistics. Theory and practice (For B.Com. and B.A., (Eco) classes) S. Chand & Co, Ltd., New Delhi.
7. Stansfield, W.D (1986) Theory and problems of genetics (including 600 problems). Schaum's outline series. McGraw-Hill Book Co., New York.
8. Sobl, R.R. and Rohif, F. J (1969) Biometry. The principles and Practice of Statistics in Biological Research. W. H. Freeman and Co., San Francisco.
9. Pillai, R.S.N and Bagawathi, V. (1987) Practical Statistics (For B.Com. and B.A., Students) S.Chand & Co. (Pvt.) Ltd., New York.
10. Mahajan, B.K. (1984). Methods in Biostatistics for Medical students and Research works. Smt. Indu Mahajan, New Delhi.

List of Journals

1. Biostatistics
2. Biostatistics | Oxford Academic - Oxford Journals
3. Biophysical Journal
4. Cell Biochemistry and Biophysics
5. International Journal of Biological Instrumentation
6. Biomedical instrumentation - IOPscience

List of Website

1. <https://academic.oup.com/biostatistics>
2. <https://www.degruyter.com/view/ijb>
3. <https://www.scimagojr.com/journalrank>
4. <https://www.hindawi.com/journals/jbp>
5. <https://iopscience.iop.org/article>
6. <https://www.vibgyorpublishers.org/journals/International-Journal-of-Bi..>

Course Outcome

Upon completion students should be able to

- CO1 understand the applications of laws and types of bonds.
- CO2 grasp the role of radiation in genetic disorder.
- CO3 apply biostatistics in analysing biological data.
- CO4 correlate the statistical tests in biology
- CO5 handle instruments in analysing biological parameter

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	3
CO2	2	2	3	3	3
CO3	2	3	3	3	3
CO4	3	3	3	3	3
CO5	2	3	3	3	3
AVERAGE	2.4	2.6	2.8	2.8	3

SEMESTER II

CORE PAPER VII

LAB COURSE II

CELL & MOLECULAR BIOLOGY, GENETICS , BIOPHYSICS,BIOSTATISTICS &BIOINSTRUMENTATION

Total Hours:

90

Credits: 4

Course Objectives

1. To learn the measurement of cells and types of cell divisions.
2. To study the morphological and genetic variations in Drosophila.

3. To understand the applications of instruments and statistics

CELL & MOLECULAR BIOLOGY:

1. Histological study of mammalian sections- Liver, Kidney, Brain, Muscle, Pituitary, Thyroid , Pancreas and Adrenal
2. Micrometry- Cell measurements using ocular and stage micrometer- Measurement of cell from any prepared slide
3. Squash preparation of grasshopper testis to study the stages of meiosis .
4. Squash preparation of onion root tips to study the stages in Mitosis.
5. Isolation and Spectrophotometric estimation of DNA and RNA from animal liver (goat/ frog)
-Demonstration only.

GENETICS

1. Morphology of male and female drosophila-Sex identification of Drosophila-Sex comb and abdominal segment.
2. Identification of mutant forms of Drosophila-
White eye, yellow eye, Ebony body, Yellow body , Vestigial wing
3. Preparation of metaphase plate (demonstration).
4. Karyotyping using Human metaphase plate -.Normal male and female , and syndromes (Down, Klinefelter and Turner)
5. To study mendelian monohybrid cross (phenotypic ratio)using color beads.
6. To study mendelian monohybrid cross (genotypic ratio)using color beads.
7. To study mendelian dihybrid cross (phenotypic ratio)using color beads.

BIOCHEMISTRY AND BIOPHYSICS:

1. Preparation of molar , normal and buffer solutions.
2. Principles and application of Spectrophotometry or Colorimetry, Electrophoresis, Centrifuge, Chromatography.

Course Outcome

Upon completion students should be able to

- CO1** identify the types and measure the size of cells.
- CO2** understand by observing the various stages of cell division.
- CO3** comprehend the mutations in drosophila and human.
- CO4** apply instruments in experimental protocols.
- CO5** analyse the data using statistical tools

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	2
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	2	3	2
CO5	3	3	3	3	2
AVERAGE	3	3	2.6	3	2.4

SEMESTER II

ELECTIVE III

RESEARCH METHODOLOGY

Total Hours: 60
Credits: 3

Course Objectives

1. To learn the fundamental methodology of research.
2. To study the laboratory management techniques.
3. To understand the guidelines ,laws and intellectual property rights in research

UNIT I:

Introduction to Research Methodology-Definition and Scope-Scientific and non-scientific methods- Observation, Selection of field, subject area, thrust area and theme-Research methods versus methodology, research and scientific methods Types of Research (descriptive/analytical, applied/fundamental, quantitative /qualitative, conceptual/empirical, Research Process.

- 10 hrs

UNIT II:

Maintenance and management of laboratory animals, Research formulation-observation and facts, prediction and explanation, induction and reduction Literature review-importance of literature reviewing in defining a problem Critical literature review, identifying gaps from Literature review.

Research reading and discriminative reading.

- 10 hrs

UNIT III:

Sources of Literature – Primary, secondary, tertiary. Collection of literature and sample: Biological abstracts, Current contents, Reviews, Monographs, peer reviewed journals, Books, News letter, CD Rom and internet facilities. Review of Literature, reference card and Bibliography software. Research designs-basic principles, meaning, need and features of good design, important concepts. Development of a research plan-exploration, description, diagnosis.

- 20 hrs

UNIT IV:

Experimentation, determining experimental and sample designs. Data Collection techniques. Scientific documentation and communication Project proposal writing, Research report writing (thesis and dissertations, research articles, oral communications)

- 10

hrs

UNIT V:

Presentation techniques – assignment, seminar, debate, workshop, colloquium, conference. Library-books, journals, periodicals, reference sources Abstracting and indexing sources, reviews, treatise, monographs, patents Internet-search engines and software, online libraries, e-books, e-encyclopedia, ted talk, institutional websites . Intellectual Property Rights (IPR)- Copy right, designs, patents, trademarks, Geographical Indications (GI). Safety and precaution- ISO standards for safety, lab protocols, lab animal use, care and welfare, animal houses, radiation hazards.

-

10 hrs

Books for Reference

- 1.N.GURUMANI 2006-Research Methodology for Biological sciences-MJP publishers-TamilNadu Book House- Chennai
2. Burns, D.M. & MacDonald, S. G. G. (1979) Physics for Biology and Premedical students. Elbs and Addison - Wesley Publishers Ltd., London.
- 3.Das, D. (1982) Biophysics and Biophysical Chemistry. Academic Publishers. New Delhi.
- 4.Palanichamy, Sand Shanmugavelu, M. (1991) Principles of Biophysics. Palani Paramount Publication, T. N.
- 5..Pattabhi,V and N. Gautham (2001) Biophysics. Narosa publication, T.N.
- 6.N.Veerakumari –BioInstrumentation-MJP Publishers-TamilNadu Book House.

List of Journals

1. Journal of Mixed Methods Research
2. International Journal of Social Research Methodology
3. International Journal of Research Methodology
4. BMC Medical Research Methodology

List of Websites

1. <https://www.tandfonline.com › toc › tsrm20 › current>
2. <https://ijrm.humanjournals.com>
3. <https://journals.sagepub.com › home › mmr>
4. <https://bmcmmedresmethodol.biomedcentral.com>

Course Outcome

Upon completion students should be able to

- CO1** know the scope, type and process of research.
- CO2** understand the laboratory practices.
- CO3** comprehend the ways and means of literature survey.
- CO4** design the experimental protocols in lab.
- CO5** analyse the data and prepare a research report

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	2	3	2	3	3
CO4	2	2	3	3	3
CO5	3	2	2	2	3
AVERAGE	2.6	2.6	2.6	2.8	3

**SEMESTER II
EDP- I
BIOPRODUCTS AND MARKETING**

**Total Hours: 45
Credits: 3**

Course Objectives:

1. To know about a variety of biologically derived products.
2. To learn about various bio-products and their marketing.
3. To encourage students to explore entrepreneurship in bio products

UNIT I: DAIRY PRODUCTS

Dairy products – special milks – cream – butter – ice cream – cheese – condensed milks – dried milks – dried milk products – Indian dairy products. -

9hrs

UNIT II: BIOPRODUCTS OF TERRESTRIAL ANIMALS

Apiculture and honey production – sericulture and silk production – poultry production – eggs and meats. -

9hrs

UNIT III :BIOPRODUCTS OF AQUATIC ANIMALS

Production of prawn – Fish and Fish products – Food of cultivable fishes – fishing methods – fish preservation - Pearl production – Harvesting of pearls -

9hrs

UNIT IV:MARKETING AND MARKETING PROCESS OF BIOPRODUCTS

Definition of marketing and marketing management –marketing process –evolution – marketing plan – marketing mix- relationship building – branding – customer retention strategies. - 9hrs

UNIT V:BIO-PRODUCTS MARKETING

Environment – market size – segmentation – using modern techniques – pricing – budgeting – market research – media- market maths – institutional support – promotion boards – events management – social responsibility. -

9hrs

TEXT BOOKS

1. Kotler, P., Armstrong, G., Agnihotri, Y.P., Ehsan, U.H., 2009. Principles of marketing – A south Asian perspective, Pearson.
2. Sukumar, D.E. 2002 Outline of Dairy Technology, Oxford Uni, New Delhi.

Books for Reference

1. Henricksons, R.L. Meat, Poultry & Sea Food Technology
2. Lawrie, R.A. Meat Science by Pergamon Press.
3. Mountney, G.J. Poultry Products Technology.

List of Journals

1. Food and Bioproducts Processing - Journal - Elsevier
2. Journal of Bioprocessing and Biotechniques- Open Access ...
3. International Journal of Bioprocessing and Biotechniques

List of Websites

1. <https://www.journals.elsevier.com › food-and-bioproducts-processing>
2. <https://www.omicsonline.org › bioprocessing-biotechniques>
3. https://www.gavinpublishers.com › journals › journals_details › internation.

Course Outcome

Upon completion students should be able to

- CO1 know about a wide range of bio products.
- CO2 understand the therapeutic and nutritional importance of bio products.
- CO3 e green entrepreneurship and bio product market.
- CO4 design small scale industry setup.
- CO5 analyse bio products market trend

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	3	2	3	3	3
CO3	2	2	3	3	3
CO4	2	2	3	3	3
CO5	2	2	2	3	3
AVERAGE	2.4	2	2.8	3	3

SEMESTER –III
CORE PAPER VIII
DEVELOPMENTAL BIOLOGY

Total Hours: 75
Credits: 4

UNIT I: EARLY DEVELOPMENTAL PROCESS

Origin of germ cells- Spermiogenesis –Hormonal control of spermatogenesis. Oogenesis- Growth of oocytes – Previtellogenesis and Vitellogenesis -Synthesis and storage of macromolecules in the oocytes - Nuclear activities during oocyte growth. Fertilization - Egg activation - Electron microscopic and biochemical aspects- Molecular events during fertilization. Factors affecting cleavage and physiology of cleavage. Gastrulation - Role of egg cortex in morphogenetic movements - Cell surface in morphogenesis – Metabolic and molecular changes in gastrulation –Exogastrulation

-15 hrs

UNIT II: ORGANOGENESIS

Formation of organ rudiments: Differentiation and development of heart, eye and kidney in a mammal. Gradients- Theories, Experimental studies in sea urchin and amphibian eggs. Factors affecting gradients. Morphogenetic fields, Organiser- Structure and Induction- Inductive tissue interactions in development- Spemann's Experimental studies.

-15 hrs

UNIT III: GENES AND DEVELOPMENT

Genes in Development and differentiation, Nucleocytoplasmic interactions, Nuclear transplantation experiments. Differentiation- Types and process involved in differentiation. Factors involved in differentiation. Dedifferentiation. Developmental genetic defects - Teratogenesis- Genetic and environmental teratogenesis- Teratoma. Amniocentesis.Role of

growth factors in development- Apoptosis – Genes involved in apoptosis – Characteristics of Ageing -15 hrs

UNIT IV: REGULATION OF METAMORPHOSIS

Metamorphosis - Morphological , biochemical changes and hormonal control during amphibian metamorphosis - Neuro - endocrine control of insect metamorphosis- Neurosecretions in crustaceans- Role in moulting and metamorphosis. Neoteny- Types, factors and significance. -15 hrs

UNIT V: MAMMALIAN REPRODUCTION

Mammalian Reproduction - Testis and ovary as endocrine gland.- Events of oestrous cycle - Phases of Menstrual cycle and its Hormonal regulation. Factors involved in regulation of ovulation in mammals. Hormonal control of pregnancy, parturition and lactation. Placental hormones - Physiology of placenta. Modes of embryonic nutrition. Reproductive Technologies- Zygote Intra- Fallopian tube transfer (ZIFT), Gamete Intra -Fallopian tube transfer (GIFT), Intra- cytoplasmic sperm injection (ICSI).Types of stem cells- Embryonic and Adult stem cells- Stem cell therapy-Characteristics of stem cells- Human Embryonic stem cell Research- Ethical issues.

-15 hrs

Books for Reference

1. Balinsky, B. L., 1981. An introduction to embryology, Saunders, Philadelphia.
2. Karp. G. and Berrill, N.J. 1981. Development, McGraw Hill, New York.
3. Eber, J.D., 1970. Interacting system in Development, Holt Rein chart and Winston, Inc. New York and Chicago.
4. Saunders, J. W. 1982. Developmental Biology. Macmillan Co., London.
5. Brachet J. 1974. Introduction to Molecular Embryology. The English Universities Press, London.
6. Gilbert, Scott. F. 1985. Developmental Biology. Sinauer Association, Inc., Publishers.
7. Browder, W. 1984. Developmental Biology, Saunders College Publishing, Rinchert and Winston.

List of Journals

1. Developmental Biology - Journal - Elsevier
2. Frontiers in Cell and Developmental Biology
3. Developmental Biology | Journal | ScienceDirect.com
4. The International Journal of Developmental Biology

List of Website

1. <https://www.frontiersin.org › journals › cell-and-developmental-biology>
2. <https://www.journals.elsevier.com › developmental-biology>
3. <https://www.sciencedirect.com › journal › developmental-biology>
4. www.ijdb.ehu.es

Course Outcome

Upon completion students should be able to

- CO1 understand the molecular changes during fertilization and development.
- CO2 realise the factors responsible for organogenesis and factors affecting the same.
- CO3 comprehend the role of genes in development and associated problems.
- CO4 associate the role of environmental factors in genetic defects.
- CO5 grasp the regulation of metamorphosis by hormones in various group of animals

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	2
CO2	3	2	3	3	2
CO3	2	2	3	3	3
CO4	3	2	3	3	3
CO5	2	2	3	3	3
AVERAGE	2.6	2.2	3	3	2.6

SEMESTER –III
CORE IX
IMMUNOLOGY & MICROBIOLOGY

Total Hours: 75

Credits: 4

Course Objectives

1. To learn about the different types of cells and their interaction in building immunity.
2. To study the types of immuno technologies in diagnosis and the vaccines involved.
3. To learn the type of microbes associated with man in various fields

UNIT I: IMMUNOBIOLOGY

Immunity-Innate immunity (Non-specific), Adaptive immunity (Specific)- Mechanism of immunity. Cells of Immune system - Stem cells, Lymphoid cells-. B and T lymphocytes. Mononuclear cells, Granulocytes. Organs of Immune system - Primary lymphoid organs and Secondary lymphoid organs. Antigens – Epitopes. Antigen - Antibody interaction (Precipitation, Agglutination, Opsonisation, Complement fixation, immune fluorescence).

-15hrs

UNIT II: IMMUNOGLOBULINS & MECHANISM OF IMMUNE SYSTEM

Immunoglobulins – Structure and types of immunoglobulins and biological function. Polyclonal antibodies. Organization and expression of immunoglobulin genes. Diseases &

Disorders of immunoglobulin synthesis. MHC - Organization and functions. Complement- Classical and alternate pathway –Functions. Cytokines and Adhesion molecules. Hypersensitive reactions. Graft Vs Host reaction -Compatibility tests- Mechanism of graft rejection.

-15hrs

UNIT III: VACCINES AND IMMUNOTECHNOLOGY

Vaccines – Mechanism of vaccine action- Attenuated and Killed vaccines - DNA Recombinant Vaccines. Immunization schedule. Hybridoma technology -Monoclonal antibody -Production and applications. Immunodiagnostics- ELISA and RIA techniques and applications.

-10hrs

MICROBIOLOGY

UNIT – 1V: CLASSIFICATION, GROWTH & STAINS

Classification of microbes (Bacteria, yeast, fungi and viruses) –Ultra structure of bacteria and viruses (DNA (T4) and RNA (AIDS) virus), Genetic recombination of bacteria.

Microbial growth: definition of growth, growth curve, measurement of growth. Culture media technique. Stain methods– simple, differential and special staining techniques – gram positive, gram negative, acid fast staining, staining for pure and mixed cultures.

-15hrs

UNIT – V: ENVIRONMENTAL & FOOD MICROBIOLOGY

Medical microbiology- bacterial diseases of man- (Cholera, Typhoid, diphtheria, tetanus), viral diseases of Man – (hepatitis, poliomyelitis, measles) Food microbiology – Role of microbes in food production, food spoilage & diseases, food preservation. Dairy products – microbes. Water – Purification & Sewage treatment. Industrial microbiology: Production of alcoholic beverages (Ethanol, Vinegar, Beer), Antibiotic production (Penicillin), SCP. Bio-fertilizers- Rhizobium, Azotobacter & BGA, Bio-pesticides – viral, bacterial & fungal. Biodegradation, bioremediation, bio-deterioration.

-20hrs

Books for Reference

1. Roitt, I.M. 1994. Essential Immunology. Blackwell Scientific, Oxford ISBN.
2. Richard, A Golds, Thomas J. Kindt & Barbara A. Osborne. 2000. Kuby - Immunology. Freeman and Co. New York.

3. D.P. Stites, A.I. Terr and T.G. Parsloio. 1997. Medical Immunology. Prentice Hall, New Jersey.
4. Srivastava, R., Ram, B.P. and Tyle, P. 1991. Molecular mechanism of Immune regulation. VCH Publishers, New York.
5. Microbiology – Concepts and Applications, Pelczar MJ, Chan ECS, King NR, McGraw-Hill, Inc. Ny.
6. Microbiology, Davis BD, Dulbecco R, Eisen HN, Gihlsbercs HS, Harper & Row, Publishers, Singapore.
7. Microbiology, Prescott LM. Haley JO, Klecin DA, WCB Publishers, Sydney.
8. Microbiology – R.P.Singh UP.
9. Principles of Gene Manipulation – Old & Primrose.

List of Journals

1. Nature
2. Journals in Immunology and Microbiology – Elsevier
3. Microbiology and Immunology - Wiley Online Library
4. Journal of Microbiology and Immunology - Lexis Publisher
5. Medical Microbiology and Immunology - Springer

List of Websites

1. <https://onlinelibrary.wiley.com> › journal
2. <https://www.lexispublisher.com> › microbiology-immunology
3. <https://link.springer.com> › journal
4. <https://www.sciencedirect.com> › journal › journal-of-microbiology-immunol.

Course Outcome

Upon completion students should be able to

- CO1** understand the Structural organisation of cells involved in immunity.
- CO2** comprehend the role of immuno globins in immune system
- CO3** grasp the diagnostic mechanisms and associated vaccines.
- CO4** grasp the types and classification of microbes.

CO5 the role of microbes in various environmental applications

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	2	3	2	3	3
CO3	3	2	3	3	3
CO4	3	3	3	3	3
CO5	3	3	2	3	3
AVERAGE	2.8	2.8	2.6	3	3

SEMESTER –III

CORE X

ENVIRONMENTAL BIOLOGY AND BIODIVERSITY

Total Hours: 75

Credits: 4

Course Objectives

1. To learn the concepts of ecology.
2. To study bio geo cycles and resources available.
3. To understand biodiversity and its conservation

UNIT I: ECOSYSTEM AND ITS PRODUCTIVITY

Review of concept of ecosystem - Natural and Man-made ecosystem with examples. Energy flow - Tropic structure and levels - Pyramids, food-chain and food-web - ecological efficiencies and productivity and its measurement.

-10hrs

UNIT II:

COMMUNITY AND POPULATION ECOLOGY

Community ecology- Community succession- Ecotone- Edge effect and Ecological niche. Population ecology- Structure and distribution- Growth curves- Natality- Mortality- Density indices- Population growth and carrying capacity- Population regulation

-10hrs

UNIT III: BIOLOGICAL CYCLES AND RESOURCE ECOLOGY

Complete and incomplete biogeochemical cycles – Gaseous and sedimentary cycle-Carbon, nitrogen, oxygen, phosphorous and sulphur cycles. Renewable (forest, wood and water) and non-renewable resources (land, Energy and mineral) – Animal resources.

Conventional and Non-conventional energy sources. Conventional (coal, lignite, petroleum and natural gas) Non conventional (solar and wind energy, Hydel, Tidal powers, salinity energy, geothermal energy)- Ecofriendly energy resources and its environmental impact .

-20hrs

UNIT IV: ENVIRONMENTAL CONSERVATION AND MANAGEMENT

Principles of conservation - Rain water harvesting - Soil health and fauna - Wildlife conservation and management – Conservation projects (Gir lion, Tiger, Crocodile, Rhinoceros and Elephant)- Biodiversity (genetics, ecosystem and species diversity)- Threats to biodiversity– Germplasm- conservation and cryopreservation. Social forestry - Tribal welfare. Biological indicators and their role in environmental monitoring- Environmental Impact Assessment. Solid waste and industrial waste disposal and management- Primary, secondary and tertiary treatment of industrial waste water and Sewage .

-15hrs

UNIT V:BIODIVERSITY

Concept and Principal of biodiversity - causes for the loss of biodiversity - Biodiversity conservation methods - Medicinal uses of forest plant (any five) -Biodiversity hotspots. Threats to species diversity - Natural and Human induced threats and vulnerability of species to extinctions - Biodiversity and Rarity, Endemism and Biodiversity. Problem of Genetic diversity loss over time : Bottle necks, Genetic drifts, Inbreeding depression . Effective and

minimum viable population size, measurements and variations . Review of Risks to Biodiversity extinctions. Extinction vortex.

-20

hrs

Booksfor Reference

1. Odum, E. P. (1983). Basic Ecology, Saunder's College Publishing, New York.
2. Bandopaghyay, J. (1985) India's Environment Crisis and response – Natraj Publishers, Dehrappn.
3. Smith, R. L. (1986). Element of Ecology, Harper and Row Publishers, New York.
4. APHA, Soli, J. Archeivala - 1988 - Wastewater treatment for pollution control Second Ed. Tata McGraw hill Publication Company Ltd., New Delhi - ISBN-O-07-463002-4.
5. Krebs, J.R. and N.B. Davis. 1987. An introduction to behavioural ecology Blackwell Scientific Publications, Oxford.
6. Alcock, J. 1984; Animal behaviour: An evolutionary approach. Sinaeur Associates Inc. Publ.
7. R.K. TondonBiodiversityTexonomy& Ecology
8. P.C. Kotwal Biodiversity and conservation

List of Journals

1. Biodiversity and Conservation - Springer
2. Journal of Biodiversity and Environmental Sciences (JBES .
3. Journal of Ecology and Environmental Sciences - Research
4. Journal of Biodiversity | Crimson Publishers Journals

List of Websites

1. <https://link.springer.com › journal>
2. <https://innspub.net › journal › journal-of-biodiversity-and-environmental-s...>
3. www.rroij.com › ecology-and-environmental-sciences
4. <https://crimsonpublishers.com › boj>

Course Outcome

Upon completion students should be able to

- CO1** grasp the basic concepts of ecology.
- CO2** comprehend the available population types in different ecosystems.
- CO3** grasp the available natural resources and the associated natural chemical cycles.

CO4 understand the concepts of biodiversity and its conservation.

CO5 appreciate environmental conservation strategies and its implementation

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	2	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	2.8	3	3	3

SEMESTER –III

CORE XI

**LAB COURSE III: DEVELOPMENT BIOLOGY, IMMUNOLOGY AND
MICROBIOLOGY ,ENVIRONMENTAL BIOLOGY**

Total Hours:

75

Credits: 4

Course Objectives

1. To learn the different stages of development in various animal models..
2. To observe and identify the microbial pathogens and parasites.
3. To study immunological reactions and measure environmental parameters

DEVELOPMENT BIOLOGY (slides /specimens /photographs)

1. Different stages in development – Insect (Drosophila) and Frog.
2. Yolk sac placenta of shark
3. Frog Embryogenesis – Cleavage stages, blastula, gastrula, yolk plug and neurula
4. Identification of Chick Embryo stages – Primitive streak, 24, 48, 72, 96 hr development
5. Chick Organogenesis –T.S through heart, eye, ear, brain of 48 and 72 hour chick embryos.

MICROBIOLOGY

Microscopic observation and identification of micro organisms.

1. Types of Bacteria, fungi and algae from the prepared slides / photographs from the book.
2. Collection and identification of fungus- Bread mould / Coconut mould.
3. Identification of parasitic protozoan – Plasmodium, Entamoeba, Trypanosoma, Leishmania .
4. Identification of bacteria – Staining methods – Gram positive and Gram negative bacteria.
5. Demonstration of (Photographic plates):
 - a. Isolation of single colonies sterile plate and serial dilution.
 - b. Enumeration of microorganisms - spread plate, Streak plate and pour plate methods.
 - c. Preparation techniques of culture medium for bacterial growth.

IMMUNOLOGY

1. Lymphoid organ anatomy –Sections of Thymus, Spleen, Bone marrow, Lymph node.
2. Preparation of peripheral blood smear to study immune cells.
3. Separation of lymphocytes- Demonstration

4. Preparation of Antigen- RBC- Demonstration.

5. Antigen anti body reaction

a. agglutinations – blood grouping

b. Immunodiffusion

c. Immunoelectrophoresis.

6. Preparation of antiserum- Demonstration

ENVIRONMENTAL BIOLOGY

1. Estimation of Aquatic – Primary productivity – Dark and Light bottle.

2. Estimation of Nitrites, Phosphates, Calcium in water samples .

3. Analysis of industrial effluents – TDS, TSS, BOD and (COD – Demonstration).

4 Analysis of macro and microorganisms in soil and soil litter.

5 Collection, Isolation and identification of Planktons (fresh water and marine)

6 Study of Pond, desert, coastal , grassland, Deep sea with special reference to their adaptation to the environment

7 Animal Associations – parasitism, mutualism and commensalism.

8 Visit to natural ecosystems and treatment plants

Field trip report to be submitted along with record note book for End semester practical examination

Course Outcome

Upon completion students should be able to

CO1 understand the various stages of development in animals.

CO2 identify the microbial pathogens and parasites.

CO3 comprehend immunological reactions.

CO4 estimate the various parameters of environment using appropriate procedure.

CO5 appreciate the association of animals with their animals.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	3	3
CO3	2	2	3	3	3
CO4	3	2	3	3	3
CO5	3	3	3	3	3
AVERAGE	2.8	2.6	3	2.8	2.8

SEMESTER –III

ELECTIVE IV
APPLIED ENTOMOLOGY

Total Hours: 75
Credits: 3

Course Objectives

1. To learn basic classification of insects.
2. To learn the culture techniques of economically important insects.
3. To study control of pests

UNIT I: INSECT CLASSIFICATION

Classification of insects up to order with examples- (Orthoptera, Hemiptera, Diptera, Lepidoptera & Coleoptera – organization & structure). Insects as pollinators, predators, parasitoids, scavengers and weed killers.

-10hrs

UNIT II: SERICULTURE

Mulberry and Non-mulberry silk worms- Biology of *Bombyx mori*. Types of silk. Grainage Technology-Procedures for seed Selection for rearing. Rearing appliances- Mountages -Types and importance. Physical characters of commercial cocoons- Defective cocoons.

-15hrs

UNIT III-APICULTURE AND LAC CULTURE

Types of Honey bees for rearing- Bee rearing- Structure of Bee comb- Modern bee hive structure (Langstroth hive and Newton's hive)-Bee Keeping equipment. Chemical composition, nutritional and medicinal value of honey. Beehive products (Bee wax, Bee venom, Propolis and Royal jelly). Lac culture -Host plants for lac insect. Cultivation of lac (Inoculation, Swarming and harvesting of lac). Processing of lac. Lac -Its economic importance.

-15hrs

UNIT IV: ECOLOGY OF INSECTS

Development of an insect – Population, Migration, Ecological factors affecting population. Insects in relation to Forensic Science. Vector borne diseases-mosquitoes, houseflies, Bed

bug, Cockroach. Insects as food for Human.

-20hrs

UNIT V: PESTS AND ITS CONTROL

Pests of Paddy (stem borer), coconut (Rhinoceros beetle), Mango (hopper), Pulse (beetles).

Control methods- Conventional and Non-conventional - Natural, Genetic, Chemical &

Hormone analogs. Biological and Integrated Pest Management (IPM).

-15hrs

Booksfor Reference

1. The Science of Entomology. William S. Romoser and John G. Stoffolano. Wm. C. Brown Publishers, England. 1994.
2. The Silkworm. An important laboratory tool. By Yataro Tazima, Kodarsha, Scientific Book Ltd., Japan. 1978.
3. Sericulture Manual: FAD, Agril, Service Bulletin, Rome.
4. Applied Entomology: P. G. Fenemore, Allaparakash, Wiley Eastern Ltd., Delhi. 1992.
5. Park, J. E and K. Park. Textbook of social and preventive medicine. Publ. Mis. Banarasides Bharol. Jabalpur.
6. Nayar, K. K, Ananthakrishnan, T. Nand B. V. David. General and Applied Entomology. Tata McGraw Hill Publ., New Delhi. 1989.
7. Entomology and Pest Management. Larry, P. Pedigo Prentice Hall, New Jersey. 1989.
8. The Insect: Structure & function by R.F.Chapman.
9. Entomology by Vasantraj David.
10. Entomology Bu Gilbert.
11. Principles of Insect Physiology by Wigglesworth.

List of Journals

1. Journal of Entomology and Zoology Studies.
2. Journal Rankings on Animal Science and Zoology - SCImago
3. International Journal of Zoology and Applied Biosciences
4. Pest management and economic zoology.

List of Websites

1. <https://www.scimagojr.com> › journalrank
2. www.worldcat.org › title › pest-management-and-economic-zoology
3. <https://www.ijzab.com>

Course Outcome

Upon completion students should be able to

- CO1** understand the systematic position of various types of insects.
- CO2** apply theoretical knowledge in sericulture to enhance production.
- CO3** analyse the advantages and drawbacks of apiculture and lac culture.
- CO4** grasp the ecology and behaviour of insects.
- CO5** comprehend the type of pests and their control

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	33
CO2	2	2	2	3	3
CO3	3	3	2	3	3
CO4	3	3	2	3	3
CO5	3	3	2	3	3
AVERAGE	2.8	2.8	2.2	2.8	3

SEMESTER III

EDP II

BIOINFORMATICS

Total Hours : 45

Credits: 3

Course Objectives

1. To learn basics of computer applications in biology.
2. To learn the applications of primary and secondary databases.
3. To study computer architecture and languages

UNIT I : INTRODUCTION

Definition , history , development , scope and application of bioinformatics in various fields.
Ethical issue in Bioinformatics .

-3 hrs

UNIT II:

Data bases - Classification of biological databases. Major Databases in Bioinformatics.
Primary databases - Nucleotide data bases - EMBL, DDBJ , GENBANK - Protein data bases
- SWISS PROT, PIR , MIPS. Secondary databases - Prosite , prints, blocks .Tertiary data
bases.

-
6 hrs

UNIT III:

Database search engines - Entrez at NCBI , SRS at EBI , STAG at DDBJ.
DNA sequencing - Single letter code of amino acids- Sequence alignments – Pair wise
alignment - Multiple sequence alignment - substitution matrices, scoring matrices – PAM
and BLOSUM. Needleman and Wunsch algorithm. Smith waterman algorithm.

- 8 hrs

UNIT III

Data base search tools for similar sequences using FASTA and BLAST programs. (NCBI – map viewer), OMIM – online Mendelian Inheritance in Man.

8 hrs

UNIT IV

Gene prediction : Various approaches in gene prediction – Extrinsic approach, AB INITIO approach, ORF prediction. Comparative genomics - Analysis of Human Genome. Comparative Genomics: Tools for genomic comparison: Applications of Comparative Genomics, Genome projects . Functional Genomics: Gene expression analysis by c DNA micro arrays, SAGE, EST.

-10hrs

UNIT V

Introduction to Computers: Computer architecture , Input and Output devices . Hardware and Software. Basics of programming languages – low level and high level language . Basics of Word, Excel and Power point. Computer aided drug design. Medical Imaging techniques - Computer aided tomography, Medical Resonance Imaging, Artificial Intelligence.

-10 hrs

Books for Reference

1. Bioinformatics (concepts, skills and applications) S.C. Rastogi *et al.* 2003 – CBS Publishers New Delhi – 2.
2. T.K.Attwood and D.J.Parry – Smith, introduction to Bioinformatics, Pearson Education Ltd., New Delhi (2004).
3. S.Sundara Rajan and R. Balaji, Introduction to Bioinformatics, Himalaya publishing House –New Delhi (2002)
4. Irfan A.Khan and Atiya Khanum, Emerging trends in Bioinformatics Ukaaz publications , Andra Pradesh (2002).
5. Arthur M. Lesk, Introduction to Bioinformatics, Oxford University Press, New Delhi (2003).
6. Algorithm Design: Foundations, analysis and internet examples by Goodrich, Michael and Roberto Tamassia, 2001. John Wiley & Sons Inc., New York.

List of Journals

1. [Bioinformatics](#)
2. [Bioinformatics and Biology Insights](#)
3. [Briefings in Bioinformatics](#)
4. Bulletin of Mathematical Biology
5. [Computers in Biology and Medicine](#)
6. [Current Bioinformatics](#)
7. Database

List of Websites

1. <https://academic.oup.com> › bioinformatics
2. <https://www.worldscientific.com> › worldscinet › jbcbb
3. bioinfolab.miamioh.edu › bioinfolab › journals
4. <https://www.bioinformatics.org> › wiki › Journals
5. <https://www.inderscience.com> › jhome

Course Outcome

Upon completion students should be able to

- CO1** apply basic methods bioinformatics.
- CO2** understand the classification of biological databases and retrieve relevant data.
- CO3** analyse the sequence alignment using various algorithms and search tools.
- CO4** realise the various approaches in gene prediction and comparative genomics.
- CO5** realise the computer language and programming techniques

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	1	1
CO2	3	3	2	2	3
CO3	2	3	2	1	3
CO4	2	3	2	1	3
CO5	2	3	2	2	3
AVERAGE	2.4	3	2	1.4	2.6

SEMESTER IV
CORE PAPER XII
ANIMAL PHYSIOLOGY & BIOCHEMISTRY

Total Hours:
90
Credits: 4

Course Objectives

1. To learn the physiological process involved in different animal models.
2. To study the major molecules and associated cycles.
3. To learn about the energy production and utilizing systems

UNIT I: NUTRITION, RESPIRATION, CIRCULATION AND EXCRETION

Nutrition: Carbohydrates, Proteins and Lipids – Physiology of absorption. Respiration: Types of respiratory mechanisms (Integumentary, bronchial, tracheal and pulmonary) – Physiology of respiration in man – Respiratory pigments and their role in oxygen and carbon dioxide transport in man. Circulation: Control of heart beat – Cardiac cycle – Electrocardiogram

(ECG) - Coagulation of blood – Haemodynamics. Excretion: Patterns of excretion in relation to environment – Physiology of excretion in man – Regulation of excretion.

-

20 hrs

UNIT II: CO-ORDINATION (NERVOUS AND ENDOCRINE) AND MUSCLE PHYSIOLOGY

Nervous co-ordination: Types of neurons – Transmission of nerve impulses – Synaptic transmission – Autonomic nervous system – Organization and functions – Reflex action. Chemical co-ordination: Neurosecretion and its importance in insects –Hormones of vertebrates and their specific role in chemical coordination –Molecular mechanism of hormone action. Muscle physiology: Molecular structure – Chemical composition – Mechanism of muscle contraction – Regulation of energetic of muscle contraction.

-

20 hrs

UNIT III: SENSORY PHYSIOLOGY AND BIOLUMINESCENCE

Sensory physiology: Receptors – Classification and Functions – Mechanism of hearing – Physiology of vision in man. Bioluminescence: Types – Chemical and Physical aspects – Functional significance.

-

15 hrs

UNIT IV: PROTEIN , CARBOHYDRATE & LIPIDS

Amino acid classification and SAR, Metabolic of Amino acids. Detoxification of Amino acid, Enzymes - Classification and preferably as drug targets, Effect of substrate, pH, temperature, Allosteric modulation. Carbohydrates and Lipids Metabolism : Digestion, absorption, metabolism. Glycolysis, glycogenolysis, gluconeogenesis, TCA cycle, Digestion and absorption, Interrelationship between different carbohydrate metabolism. Lipid(Cholesterol biosynthesis and metabolism) Prostaglandins.

- 20 hrs

UNIT V: BIOENERGETICS

Bioenergetics : Energy producing and utilizing systems, Electron transfer and oxidative phosphorylation, Concept of CYP enzymes and implications in pharmacology. Vitamins and

minerals : Free radicals and anti-oxidants.

-

15 hrs

Books for Reference

1. Hoar, W.S (1968): General and Comparative Physiology, Prentice Hall
2. Prosser, C.L. (1973): Comparative Animal Physiology, 3rd edn. W.B. Saunders & Co., Philadelphia.
3. Wood, D.W. (1968): Principles of Animal Physiology
4. Bentley, (1971): Endocrine and osmoregulation Springer Verlag, N.Y.,
5. Palmen, J.D. Brown, J.R. and Hastings, J. W. (1970): Biological clocks, Academic Press, London.

List of Journals

1. Journal of Animal Physiology and Animal Nutrition - Wiley
2. Journal of Physiology and Biochemistry - Springer
3. Journal of Comparative Physiology B - Springer
4. Animal biochemistry | List of High Impact Articles | PPTs

List of Websites

1. <https://www.longdom.org › scholarly › animal-biochemistry-journals-article>.
2. <https://www.scimagojr.com › journalsearch>
3. <https://link.springer.com › journal>
4. <https://onlinelibrary.wiley.com › journal>

Course Outcome

Upon completion students should be able to

- CO1** understand the basics of various physiological functions.
- CO2** comprehend the role of chemical signals and neuron coordination.
- CO3** grasp significance of interesting natural bio phenomenon.
- CO4** apply the cycles involved in metabolism of major molecules in routine life diagnosis.

CO5 adapt and improve the production and utilization of energy in animal systems

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	2	2	3	3	3
CO3	3	2	2	3	3
CO4	3	2	3	3	3
CO5	3	2	3	3	3
AVERAGE	2.8	2.2	2.8	3	3

SEMESTER IV

CORE XIII

EVOLUTION

Total Hours: 90
Credits: 4

Course Objectives

1. To learn the mechanism of evolution using available evidences.
2. To study the genetic basis of evolution to understand speciation.
3. To understand the various types of behaviours in animals.

UNIT I: EVIDENCES FOR EVOLUTION

Evidences: The need for evidences for the fact of evolution - Evidences from comparative anatomy, embryology. Evidences physiology and biochemistry - (visual pigments, haemoglobin, protein sequences in phylogeny), evidences from paleontology-Types of fossils-Fossilization. Evidences from genetics (.Gene and chromosome homology, hybridization, universality of genetic code)

- 15 hrs

UNIT II: MECHANISM OF EVOLUTION

Mutationism - Views of De Vries and R.B.Golschmidt; Hopeful monsters - Inadequacies of mutationism. Lamarckism - Lamarckian postulates - Inadequacies of Lamarckism. Natural selection -- Modern understanding of Natural selection- Stabilizing, diversifying and directional selection. Adaptation - Nature and types of adaptation - Adaptive trends- - quantifying adaptation - Batesian and Mullerian mimicry –Mimicry and evolution. Polymorphism- Transient and Stable- Maintenance of Polymorphism.

- 15 hrs

UNIT III: GENETIC BASIS OF EVOLUTION AND SPECIATION

Role of mutation, genetic drift, hybridization , polyploidy in evolution. Isolating mechanism - pre mating, post mating - problems of the origin of isolating mechanism. Structure of species - clones, peripheral population and peripheral isolates. Mayr's founder principle and genetic evolution in the peripheral isolates - Ecological opportunities for speciation. Rates of Evolution- Orthotely, Bradotely and Tachytely- Gradualism Vs Punctuated equilibrium. Extinction and its causes. Human Evolution - Sociobiology: Definition and scope - selfish gene, altruism and kin selection – bioethics.

-

20 hrs

UNIT IV: ANIMAL BEHAVIOUR

Adaptive value of behavior- Variable behavior-- Behaviour types - Taxis, kinesis, Reflex, learning behavior-Classification of learned behavior. Visual communication – Dance language of honey bee; Mating dance of birds. Auditory (Sound/Vocal) communication –

songs of birds and sounds of mammals. Chemical communication – Pheromones of insects; Pheromones of mammals. Migration of birds; Navigation, animal orientation and echolocation.
-15hrs

UNIT V

Sociobiology-Social behaviour – habitat selection; dominance hierarchy. Territoriality; Aggregation; Social competition; Aggression and cannibalism. Social training – Schooling in fishes; flocking in birds; societies in primates.

-20hrs

Books for Reference

1. Kapoor, V.C. (1995). Theory and Practice of Animal Taxonomy. Oxford and IBH Publishing Co., Pvt. Ltd. New Delhi.
2. D. S. Bendall (ed) 1983). Evolution from Molecules to Men. Cambridge University Press.
3. M. Grene (ed) (1983). Dimension of Darwinism. Cambridge University Press.
4. E.C. Minkoff (1984). Evolutionary Biology. Addison-Wesley. London.
5. Montagu (ed) (1980). Sociobiology examined. Oxford University Press

List of Journals

1. Evolution
2. Ecology and Evolution
3. Molecular Biology and Evolution
4. Journal of Evolutionary Biology

List of Websites

1. <https://onlinelibrary.wiley.com › journal>
2. <https://www.nature.com › nature ecology & evolution>
3. <https://www.frontiersin.org › journals › ecology-and-evolution>
4. <https://link.springer.com › journal>

Course Outcome

Upon completion students should be able to

- CO1** comprehend the process of evolution using available evidences.
- CO2** appreciate the theories associated, extinction and their significance in evolution
- CO3** understand the genetic basis of evolution and speciation.
- CO4** grasp the role of pheromones and other chemical signalling in alteration of animal behaviour.
- CO5** apply and understand the various social behaviour in animals.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	3	3	3	3	2
CO3	3	2	3	3	2
CO4	2	3	3	3	3
CO5	3	2	3	2	2
AVERAGE	2.8	2.4	3	2.8	2.4

**SEMESTER IV
CORE PAPER XIV
LAB COURSE IV**

ANIMAL PHYSIOLOGY AND EVOLUTION

**Total Hours: 90
Credits: 4**

Course Objectives

1. To understand the physiological processes through proper procedures.
2. To develop protocols to estimate blood parameters.
3. To understand evolution by studying fossil records.

ANIMAL PHYSIOLOGY

1. Estimation of RQ in fish with reference to Light and Dark.
2. Oxygen consumption in a terrestrial animal (Cockroach).
3. Salt loss and salt gain in fish-Hypertonic and Hypotonic medium.
4. Qualitative urine test for pregnancy (HCG – Kit) (Demonstration)
5. Blood clotting time
6. Clotting time
7. ESR
8. Rouleaux formation
9. Preparation of haematin crystal
10. Estimation of Haemoglobin.
11. Principles and application - Respirometer, Haemoglobinometer

EVOLUTION (Specimen / photographs)

1. Identification and study of invertebrate fossils (Ammonoidea, Nautiloids,), living fossil (Trilobite, Peripatus, Limulus)- Fossil bird (Archaeopteryx).
2. Observation of forelimbs and hind limbs of vertebrates (frog, calotes ,bird and mammal)-To study common pattern of pentadactyl limb and common ancestry of

vertebrates.

Practical record to be submitted during the End Semester practical examination

Course Outcome

Upon completion students should be able to

- CO1** analyse the physiological processes in various animals.
- CO2** apply the procedures in estimating various parameters of blood and associated factors.
- CO3** comprehend the process of evolution through available fossils.
- CO4** analyse the concepts of homology and analogy by studying osteology.
- CO5** identify ancestral patterns in vertebrates.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	3	3	2
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	2	3	3	3
AVERAGE	2.8	2.8	3	3	2.8

SEMESTER – IV

CORE – XV

PROJECT

Total Hours: 75

Credits: 4

Course Objectives

1. To enable independent research.
2. To develop abilities to follow application oriented research.
3. To report and find solutions to current issues and problems.

MODULE

**Project work for IV semester –ANY ONE can be selected of the following headings-
Submission of dissertation**

1. Literature based reviews on any aspects of zoology
2. Questionnaire based surveys-Case studies
3. Experimental studies in animal models
4. Clinical studies
5. Field studies-surveys

Course Outcome

Upon completion students should be able to

- CO1 acquire technical knowledge on selected project topic.
- CO2 identify relevant problems and find solution.

- CO3 design simple ,cost effective solutions to complex problems.
- CO4 communicate research solutions and outcomes effectively.
- CO5 continue to address local relevant problems with simple solutions and contribute to Society

SEMESTER IV
ELECTIVE V
FISHERY BIOLOGY

Total Hours: 45

Credits: 3

Course Objectives

1. To study the classification of economically important fish.
2. To understand reproduction and immune response in fish.
3. To learn aquatic productivity in Indian scenario

UNIT I: BIONOMICS AND CLASSIFICATION

Study of habit, food, feeding adaptations, growth, reproduction behaviour, fecundity and spawning of Indian major carps, three live fishes, three exotic fishes and six economically important marine fishes. Classification of the above fishes as in Day's volumes, or in Munro's volume or in FAO Publications.

-10 hrs

UNIT II: REPRODUCTION BIOLOGY

Role of hormones in reproduction - maturity stages - morphological and histological observation of gonads – Cryopreservation. Growth Study: Age determination - length-weight relationship - factors influencing growth -condition factor - tagging methods.

-10 hrs

UNIT III: FISH GENETICS AND IMMUNOLOGY

Sex determination in fish – monosex production - hormonal and chromosomal methods - hybridization techniques in aquaculture androgenesis and Gynogenesis fish immune system.

-10 hrs

UNIT IV: FISH AND PUBLIC HEALTH

Diseases caused by fishes in man - prevention. Uses of fishes as biological control of diseases in man. Fish as food for human health. Preservation and processing of fishes. Fishery by-products.

-5

hrs

UNIT V: CAPTURE FISHERY OF INDIA

Fishery zones of India and the type of fishery in these zones. At least six types of economically important marine pelagic, fishes to be studied with regards their fishery and the methods of capture. Reservoir fishery.

-

10hrs

Books for Reference

1. Baluyut, E. A. (1989). Aquaculture systems and Practices. A selected review Publishing House, New Delhi.
2. Chondar, A (1970). Handbook of breeding of Indian major carps by pituitary hormone injection. Agra Satisdh Book Enterprise.
3. Das M. C. and Patnaik, P. N. (1994). Brackish water culture. Palani paramount Publications, Palani, T. N.
4. Day, F (1958). Fishes of Indiaa , Vol. I and Vol. II. William Sawson and Sons Ltd., London.
5. Jhingran, C. G. (1981). Fish and Fisheries of India. Hindustan Publilcating Co., India.
6. Maheswari. K. (1983) Common fish disease and their control. Institute of FIOsheries Education, Powarkads(M. P.)

List of Journals

1. Journal of Fish Biology
2. Journal of Applied Ichthyology
3. Journal of Fish Biology - Wiley Online Library
4. Journal of Fish Biology - Scimago
5. Journal of Fisheries Research

List of Websites

1. <https://onlinelibrary.wiley.com › journal>
2. <https://www.scimagojr.com › journalsearch>
3. www.alliedacademies.org › journal-fisheries-research

Course Outcome

Upon completion students should be able to

- CO1 understand the various parameters associated with fish behaviour.
- CO2 perform artificial breeding to enhance productivity and apply favourable conditions for reproduction.
- CO3 comprehend the techniques to produce disease resistant varieties.
- CO4 apply meat preservation techniques to export and produce fish by products.
- CO5 grasp fishery and production in Indian scenario.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	2	3	3	3	3
CO3	2	2	3	3	3
CO4	3	2	2	3	3
CO5	3	3	2	3	3
AVERAGE	2.6	2.6	2.6	3	3

QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS)

Anna Salai, Chennai – 600 002.

**DEPARTMENT OF ADVANCED ZOOLOGY AND
BIOTECHNOLOGY**

SYLLABUS

**B.Sc. ADVANCED ZOOLOGY AND BIOTECHNOLOGY
(Branch VI a)**



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

(Offered from the Academic year 2017 – 2018)

CONTENTS

- 10. Rules and regulations for the Programme
- 11. Programme Outcomes

12. Programme Specific Outcomes
13. Programme profile
14. Evaluation pattern of CA
15. Rubrics for CA Evaluation
16. Evaluation pattern for end semester
17. Course profile – semester I and II
18. Course profile – semester III and IV
19. Course profile – semester V and VI

Programme Outcomes

On completion of the Programme, the learner is able to:

PO 1	Apply Practical and mathematical skill in all aspects
PO 2	Identify quality knowledge of the subject

- PO 3** Utilize the subject knowledge and communication skills to appear for competitive exams
- PO 4** Acquire theoretical, practical and mathematical knowledge
- PO 5** Analyse the basic computational skills

Program Specific Outcomes (PSO)

The Under Graduate students of Zoology should be able to

PSO1	Acquire basic knowledge about faunal diversity. Understand the basic concepts of biology of animals and comprehend the relationship between animals and their environment.
PSO2	To relate the behaviour, physiology, cell biology, genetics, taxonomy with environment. and to analyse the relationships among animals, plants, microbes.
PSO3	Understand the structural organization of the cell, cell organelles and their functions. Understand the concepts of genetics, microbiology and immunology and their importance in human health.
PSO4	understand the applications of biological sciences in agriculture, health, environmental conservation and Medicine. Perform procedures as per laboratory standards in the above mentioned areas.
PSO5	comprehend the application of other basic sciences like statistic, physics and chemistry in zoology. Gain knowledge about latest trends or advancements in the specified topics and apply the knowledge of entomology in agricultural and domestic practices.

Programme Profile

From 2017-2018

Credits and Marks Consolidation – B.Sc.,

Subject Component	No. of Papers	Total Marks	Total Credits
Part I - Language	4	400	12
Part II – English	4	400	12
Total	8	800	24
Part III			
Core	15	1500	64
Elective	3	300	15
Allied	6	600	20
Total	24	2400	99
Part IV			
NME	2	200	4
Soft Skills	4	400	8
EVS	1	100	2
Value Education	1	100	2
Total	8	800	16
Part V			
Extension Activities			1
Grand Total	40	4000	140

Frame Work

Distribution of Hours, Marks and Credits for B.Sc., Advanced Zoology and Biotechnology

I B.Sc ADVANCED ZOOLOGY AND BIOTECHNOLOGY

Sem	Component	Subject Code	Title of the Paper	Credits	Hrs/ Wk	Total Hours	CA	SE	Total Marks
I	Language	173301	Tamil Paper - I	3	4	60	25	75	100
	English	173801	English Paper -I	3	4	60	25	75	100
	Core	172501	Core Paper 1- Invertebrata - I	5	5	75	25	75	100
	Core	172502	Core Paper 2- Invertebrata -II	5	4	60	25	75	100
	Core Practical		Core Practical I : Invertebrata And Chordata (No Exam)	-	3	45	-	-	-
	Allied		Allied I - Paper I- Chemistry	5	3	45	25	75	100
	Allied Practical		Allied I Practicals		3	45			
	NME-1		Arts Dept	2	2	30	40	60	100
	Soft Skills-1	179001	Essentials Of Language & Communication	2	2	30	40	60	100
			Total	25	30				700
II	Tamil	173302	Tamil Paper - II	3	4	60	25	75	100
	English	173802	English Paper -II	3	4	60	25	75	100
	Core	172503	Core Paper - 3 Chordata	4	6	90	25	75	100
	Core	172504	Core Practicals- Invertebrata & Chordata	4	6	90	25	75	100
	Allied		Allied - I Paper II - Chemistry	3	4	45	25	75	100
	Allied		Allied -I Practicals	2	2	45	25	75	100
	NME- 2		Arts Dept	2	2	30	40	60	100
	Soft Skills -2	179002	Essentials of Spoken & Presentation Skills	2	2	30	40	60	100
			Total	23	30				800

II B.Sc ADVANCED ZOOLOGY AND BIOTECHNOLOGY

Sem	Component	Subject Code	Title of the Paper	Credits	Hrs/ Wk	Total Hours	CA	SE	Total Marks
III	Tamil	173303	Tamil Paper - III	3	6	90	25	75	100

	English	173803	English Paper -III	3	6	90	25	75	100
	Core	172505	Core Paper -5 Cell & Molecular Biology And Genetics	4	4	60	25	75	100
	Core	172506	Core Paper - 6 Biotechnology	4	4	60	25	75	100
	Core Practicals		Core Practical II Environmental Biology And Developmental Biology		3	-	-	-	-
	Allied		Allied - II- Paper I PBPB	5	3	45	25	75	100
	Allied Practicals		Allied II - Practicals		2	30	-	-	-
	Soft Skills-3	179003	Personality Enrichment	2	2		25	75	100
			TOTAL	21	30				600
IV	Tamil	173304	Tamil Paper IV	3	6	90	25	75	100
	English	173804	English Paper IV	3	6	90	25	75	100
	Core	172507	Core Paper - 7 Biophysics, Biostatistics	4	6	90	25	75	100
	Core	172508	Core Paper - 8 Practical II: Cell & Molecular Biology , Genetics , Biotechnology, Biostatistics And Biophysics	4	3	45	25	75	100
	Allied		Allied II - Paper II : PBPB	3	3	45	25	75	100
	Allied		Allied II - Practicals	2	2	30	25	75	100
	Soft Skills-4	179004	Paper IV – Basic Computer Skills and Applications	2	2	30	40	60	100
	EVS	174001	Environmental Studies	2	2	30	40	60	100
	Extension Activities		NSS, NCC,YRC, RRC, SPORTS, EnviroClub etc..	1					
			TOTAL	24	30				800

III B.Sc ADVANCED ZOOLOGY AND BIOTECHNOLOGY

Sem	Component	Subject Code	Title of the Paper	Credits	Hrs/ Wk	Total Hours	CA	SE	Total Marks

V	Core	122549	Core Paper 9 : Developmental Biology	4	5	75	25	75	100
	Core	122550	Core Paper 10 : Microbiology & Immunology	4	5	75	25	75	100
	Core	122551	Core Paper 11: Environmental Biology	4	5	75	25	75	100
	Core	122552	Core Paper 12: Evolution & Animal Behaviour	4	4	60	25	75	100
	Core Practical		Practical III	-	3	45	-	-	-
	Core Practical		Practical IV	-	3	45	-	-	-
	Elective	122553	Elective I : Medical Laboratory Technology & Biochemistry	5	5	75	25	75	100
			Total	21	30				500
VI	Core	122554	Core Paper 13: Animal Physiology And Biochemistry	5	9	135	25	75	100
	Core	122555	Core Paper 14- Practical III: Physiology And Biochemistry	5	4	60	25	75	100
	Core	122556	Core Paper 15 - Practical IV: Cell And Molecular Biology And Genetics, Biotechnonology , Microbiologyand Immunology	4	4	60	25	75	100
	Elective	122557	Elective II: Medical Laboratory Technology - II	5	6	90	25	75	100
	Elective	122558	Elective III: Public Health And Hygiene	5	5	75	25	75	100
	VE	124003	Value Education	2	2		40	60	100
TOTAL				26	30	600			
Grand Total				140					

Distribution of Marks for Continuous Assessment

Part I, Part II & Part III – Theory

Test			Best 2 out of 3	Assignment / seminar		Assignment on Glossary	Model Exam	Attendance	Total	Reduced to
1	2	3		1	2					
20	20	20	40	10	10	5	25	10	100	25

Test (Best two out of three) : 40 Marks

Assignment / Seminar 2 x 10 : 25 Marks

Model Examination 80 / 8 : 25 Marks

Attendance : 10 Marks

100 Marks (reduced to 25)

Attendance:

90% & above 10 Marks

80 % & above 9 Marks

75 % & above 8 Marks

65 % & above 7 Marks with condonation

[condonation – Theory and Practicals – separately]

50% to 65 % - To skip the examination of that year and can write the exam in the next semester/year – 5 Marks

Below 50 % - Has to repeat the semester after the completion of the course.

Semester Examination:

Question Paper Pattern: Theory

Section A (K1) : (10 out of 12) x 2 = 20 Marks

Section B (K2) : (5 out of 8) x 5 = 25Marks

Section C (K3) : (3 out of 5) x 10 = 30 Marks

Total : 75 Marks

QUESTION PAPER PATTERN -UG

Knowledge Level	Section	Word Limit	Marks	Total
K1	A-10/12x2 marks	50	20	75
K1, K2	B-5/8x5 marks	150	25	
K2, K3	C- 3/5x10	300	30	

Part V:

Semester End Examination : 60 marks
Continous Internal Assessment : 40 marks

Distribution of CIA marks for elective papers:

Seminar/presentation	Assignment/ term paper	Written/ oral test	Total
20	10	10	40

Semester End Exam : Theory paper – 60 marks – duration 2.30 hrs

Question paper pattern: 10 x 6 =60 marks(10 out of 15)

I SEMESTER
CORE PAPER – 1: INVERTEBRATA-I

Total Hrs:75
Credits: 5

Course Objectives:

1. To study functional morphology of lower invertebrate fauna.
2. To understand the basic organisation of invertebrates.
3. To study the mode of life and life cycle of lower forms.

UNIT I

Principle of taxonomy, Binomial nomenclature, Classification of Animal Kingdom.

Protozoa: General characteristics and classification upto classes with examples. Type study - Paramecium, Parasitism in Protozoans (Entamoeba, Plasmodium and Trypanosoma), Economic importance.

- 15

hrs

UNIT II

Porifera: General characteristics and classification upto classes with examples. Type study of Sycon. Canal system in sponges, Economic importance of sponges.

- 15

hrs

UNIT III

Coelenterata: General characteristics and classification upto classes with examples. Type study of Obelia. Polymorphism, Corals and coral reefs.

- 15

hrs

UNIT IV

Helminthes: General characteristics and classification upto classes with examples. Type study of Taenia solium, Liver fluke – life cycle and adaptations.

- 15

hrs

UNIT V

Aschelminthes: General characteristics and classification upto classes with examples. Type study of Ascaris. Nematode parasites in relation to human welfare - *Wuchereria bancrofti*, *Enterobius vermicularis*, *Ancylostoma duodenale*.

-15

hrs

Books for Study

1. Ekambaranatha Ayyar & T.N. Anantha krishnan 1992 Manual of Zoology Vol – I (Invertebrata) Part I & II Viswanathan Pvt. Ltd.
2. Jordon EL and Verma P.S. (1995), Invertebrate Zoology, S.Chand & Co, New Delhi

Books for Reference:

1. Kotpal, R.L, S.K.agarwal, R.P.R.Khetarpal 1989 Modern text book of Zoology, Rastogi Publication.
2. Barnes, R.D. 1982, Invertebrate Zoology IV Edn. Holt Saunders International Edn.
3. Barrington, E.J.W., 1979 Invertebrates Structure and function 2nd Edn. ELBS and Nelson.

List of Journals

1. Journal of Invertebrates
2. International Journal of Science: Nature

List of Websites

1. www.earthlife.net/inverts/an-phyla.html Brief overview of all invertebrate phyla with links to information on specific groups.
2. Invertebrate – Wikipedia <http://en.wikipedia.org/wiki/Invertebrate> Foundational information on the classification, phyla, and life history of invertebrates.
3. Invertebrates – Animal Kingdom <http://animalkingdom.net/category/invertebrates/> General website on invertebrates with links to other websites for specific groups.

Course Outcomes:

Upon completion students should be able

- CO1 appreciate the diversity of lower invertebrate fauna.
- CO2 interpret the gradual evolution of invertebrates.
- CO3 understand the basic structure, organization and economic importance.
- CO4 deduce the adaptation of animals to their environment
- CO5 Comprehend the human parasitic forms and their special adaptations

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	2
CO2	3	3	2	3	2
CO3	3	3	3	3	2
CO4	3	2	2	3	2
CO5	3	3	2	2	2
AVERAGE	3	2.8	2.2	2.8	2

I SEMESTER
CORE PAPER – 2 - INVERTEBRATA -II

Total Hrs:60
Credits: 5

Course Objectives:

1. To study the organ systems of higher invertebrates
2. To compare the structure and function of higher invertebrate groups.
3. To understand special adaptations

UNIT – I

Annelida: General characteristics and classification upto classes with examples.Type study of Nereis. Vermiculture, Metamerism & Nephridia.

- 12

hrs

UNIT – II

Arthropoda: General characteristics and classification upto classes with examples.Type study of Penaeus. Peripatus, Limulus and its affinities.

- 12

hrs

UNIT – III

General topics: Crustacean larvae and their significance, Mouth parts of insects. Social life in insects. Beneficial insects and harmful insects, Metamorphosis in insects.

- 12

hrs

UNIT – IV

Mollusca: General characteristics and classification upto classes with examples.Type study of Pila. Torsion in Gastropoda, Economic importance of Mollusca-pearl culture, Foot modification in mollusca.

- 12

hrs

UNIT – V

Echinodermata: General characteristics and classification upto classes with examples. Type study star fish. Echinoderm larvae and their significance. Water vascular system in Echinoderms.

- 12

hrs

Books for Study

1. Ekambaranatha Ayyar & T.N. Anantha krishnan 1992 Manual of Zoology Vol – I (Invertebrata) Part I & II Viswanathan Pvt. Ltd.
2. Jordon EL and Verma P.S. (1995), Invertebrate Zoology, S.Chand & Co, New Delhi

Books for Reference:

1. Kotpal, R.L, S.K.agarwal, R.P.R.Khetarpal 1989 Modern text book of Zoology, Rastogi Publication.
2. Barnes, R.D. 1982, Invertebrate Zoology IV Edn. Holt Saunders International Edn.
3. Barrington, E.J.W., 1979 Invertebrates Structure and function 2nd Edn. ELBS and Nelson.

List of Journals

1. Journal of Invertebrates
2. International Journal of Science: Nature

List of Websites

1. www.earthlife.net/inverts/an-phyla.html Brief overview of all invertebrate phyla with links to information on specific groups.
2. Invertebrate – Wikipedia <http://en.wikipedia.org/wiki/Invertebrate> Foundational information on the classification, phyla, and life history of invertebrates.
3. Invertebrates – Animal Kingdom <http://animalkingdom.net/category/invertebrates/> General website on invertebrates with links to other websites for specific groups

Course Outcomes:

Upon completion students should be able to

- CO1** Understand the basic structure, organization of higher invertebrates.
- CO2** able to understand connecting links and their special features.
- CO3** assess the larval adaptive features.
- CO4** comprehend the parasitic adaptations in higher invertebrates.
- CO5** correlate the divergence of characters from common ancestors.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3

C02	3	3	2	2	3
C03	3	3	3	3	2
C04	3	3	1	3	3
C05	3	3	2	2	2
AVERAGE	3	3	2.2	2.4	2.6

**II SEMESTER
CORE PAPER – 3 CHORDATA**

**Total Hrs : 90
Credits : 4**

Objective: Functional morphology of the types included , with special emphasis on the adaptations to their mode of life.

UNIT: I PROCHORDATES & PISCES

General characters & outline classification of phylum chordate up to order with eg.
Origin of Chordates.

Prochordata : Amphioxus, Ascidian , Balanoglossis - Organisation & Affinities.

Agnatha : Structure and Affinities of Petromyzon.

Pisces : Scoliodon Organisation

Migration and Parental Care in fishes, Accessory respiratory organs in fishes.

- 30 hrs

Unit – II AMPHIBIA

Characteristics and Classification of Amphibia up to order level.

Frog: Organization, metamorphosis and terrestrialisation.

Parental care in Amphibia, Gymnophiona: neotony .

-15

hrs

UNIT – III REPTILIA

Characteristics and Classification of Reptilia up to order level.

Calotes: Organization

Identification of Poisonous snakes, south Indian snakes. Poison apparatus and Biting mechanism, Extinct reptiles, Rhycocephalia

- 15 hrs

Unit – IV AVES

Characteristics and Classification of Birds up to order level

Columba livia: Organization

Flight adaptations in birds, Migration of birds, Birds are glorified reptiles

- 15 hrs

UNIT – V MAMMALIA

Characteristics and Classification of Mammals up to order level

Oryctolagus: Organisation

Prototheria and Metatheria-Structure and Affinities, Dentition in Mammals, stomach in mammals.

Adaptive radiation in mammals, Aquatic mammals

15hrs

Books for Study

1. Ekambaranatha Ayyar and T.N. Ananthakrishnan, 1995. "A Manual of Zoology". Vol 2 (Part 1 & 2), S. Viswanathan, Chennai
2. Jordan E.L and P.S. Verma, 2000 "Chordate Zoology" S. Chand, New Delhi.

Books for Reference

1. De Beer G, 1966, "Vertebrate Zoology", Sedgwick & Jackson, London.
2. Young J.Z, 1950, "The Life of Vertebrates", Oxford University Press, London.
3. Newman. H.H, 1939, "The Phylum Chordata", Mc Millan, New York.

List of Journals

1. [PLOS One](https://doi.org/10.1371/journal.plosone)
2. International Journal of Science: Nature
3. Journal of Mammalogy

List of Websites

1. [https://www.acsedu.co.uk > Courses > Environmental > VERTEBRATE-Z](https://www.acsedu.co.uk/Courses/Environmental/VERTEBRATE-Z)
2. [https://www.sciencedaily.com > terms > vertebrate](https://www.sciencedaily.com/terms/vertebrate)
3. [https://en.wikipedia.org > wiki > List_of_biology_websites](https://en.wikipedia.org/wiki/List_of_biology_websites)

Course Outcomes:

Upon completion students should be able to

CO1 understand the diversity of higher fauna.

CO2 interpret the gradual evolution of chordates from invertebrates.

CO3 comprehend the basic structure and organization

CO4 apprehend the adaptive radiation in animals

CO5 analyse the consequence of terrestrialization

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	2
CO2	3	3	2	2	2
CO3	3	3	2	2	2
CO4	3	3	2	2	3
CO5	3	2	2	2	2
AVERAGE	3	2.8	2	2	2.2

CORE PAPER 4

PRACTICAL I: INVERTEBRATA AND CHORDATA

Semester: I & II

Total Hours: 90
credits:4

Course Objectives:

1. To dissect the organ systems of invertebrates and chordates.
2. To compare the structure and function of invertebrate and chordate groups
3. To understand special adaptations in animals

DISSECTIONS

Cockroach: Digestive System

Nervous system

Reproductive system

Prawn: Nervous system

Appendages

Any Vertebrate: (any fish) Digestive System

MOUNTINGS

Cockroach : Mouth Parts

Mosquito : Mouth Parts

House fly : Mouth parts

Fish : Placoid scales , cycloid scales, ctenoid scales.

SPOTTERS

1. **Classify giving reasons:**

Paramecium, Obelia colony, Taenia, leech, Penaeus, Pila, Asterius, Amphioxus, Scoliodon, Testudo, Columba livia, Rabbit.

2. **Draw labeled sketches:**

Medusa of Obelia, T.S of *Fasciola*, *Taenia*, *Ascaris*, T.S. of *Nereis*, T.S through pharynx of *Amphioxus*, *Rana*: Skull, Girdles (pectoral & pelvic)

3. **Biological significance:**

Conjugation in Paramecium, Gemmule of sponges, Physalia, Peripatus, Chaetopterus, Limulus, Petromyzon, Ammocetus, Balanoglossus, Hippocampus, Ichthyophis, Axolotl, Chamaeleon, Draco, Echeneis, Exocoetus.

4. **Relate Structure & Function:**

Spicules in sponge, scolex (*Taenia*), Parapodium (*Neries*) Petasma in prawn, radula (*Pila*), Pedicellaria in star fish, placoid scales in shark, electric organ (Narcine/Torpedo), quill feather, carapace & plastron, synsacrum.

5. **Descriptive Notes:**

Medusa of obelia, Ascidian, Balanoglossus, Redia, Cercaria, Filarial worm, Hook worm, Corals, Glochidium, Lepas, Bippinaria, Amphioxus, Anguilla, Hyla, Rhacophorus, Naja, Dentition (Oryctolagus & dog).

RECORD of the work done in the laboratory must be submitted during the practical examination.

Books for Study

1. Ekambaranatha Ayyar and T.N. Ananthakrishnan, 1995. "A Manual of Zoology". Vol 1 and 2 (Part 1 & 2), S. Viswanathan, Chennai
2. Jordan E.L and P.S. Verma, 2000 "Invertebrate Zoology" S. Chand, New Delhi
2. Jordan E.L and P.S. Verma, 2000 "Chordate Zoology" S. Chand, New Delhi.

Books for Reference

1. A Manual of Practical Zoology: Invertebrates Paperback – 1 Dec 2010 by [Verma P.S.](#) (Author)
2. Practical Zoology: Vertebrate Paperback – 3 Aug 2015 by [S. S. Lal](#) (Author)
3. Non-Chordate (Invertebrate) Zoology Practical Paperback – 2009 by [Pandey](#) (Author), [Shukla](#) (Author)

Course Outcomes:

Upon completion students should be able to

CO1 have hands on experience of dissecting invertebrates and chordates

CO2 appreciate the structural modifications of animals

CO3 assess the development of adaptive features.

CO4 compare the gradual emergence of evolutionary traits in animals by studying connecting links

CO5 comprehend the special features in organisms with reference to their environment

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	2	3	2
CO4	3	3	3	2	2
CO5	3	3	2	3	3

AVERAGE	3	3	2.6	2.8	2.6

SEMESTER-III

CORE PAPER 5

CELL AND MOLECULAR BIOLOGY & GENETICS

Total hrs : 60

Credits : 4

Course Objectives:

1. Understand the basic structure and functions of a cell.
2. To explore the molecular architecture of biomolecules and their complex interactions
3. To understand the basic principles of heredity and the mechanism of inheritance

UNIT – I

Prokaryotic and eukaryotic cell - Animal cell structure. Plasma Membrane: Structure – lamellar, unit membrane, fluid mosaic models- functions. Endoplasmic reticulum: Morphology, structure- types and functions. Golgi complex: Structure and Functions. Lysosome: Structure, polymorphism and functions . - 15 hrs

UNIT – II

Mitochondria: Structure , Functions – Krebs cycle – ETP. Ribosomes: Structure and protein synthesis. Nucleus & Nucleolus: Structure and functions. Chromosome: Structure- Giant chromosomes, Lamp brush chromosomes. Nucleic Acids: Molecular structure of DNA & RNA - Types of RNA . Mechanism of replication of DNA. - 15 hrs

UNIT – III

Mendelism – Mendel's experiments and laws of Mendel, Mono, Di and Tri hybrid crosses. Modifications of mono hybrid phenotypic ratio. Multiple Alleles- Blood group inheritance in man & Rh factor. - 10 hrs

UNIT – IV

Linkage – Morgan's experiments, theories of linkage, factors affecting linkage. Crossing over- Types, evidence and significance of Crossing over. Mapping of Chromosomes. Sex determination in man, Sex-limited and Sex-influenced inheritance in Man. - 10 hrs

UNIT – V

Cytoplasmic inheritance. Inbreeding, Out breeding – Heterosis [Hybrid Vigour], Inborn errors of metabolism. Hardy – Weinberg's principle and factors affecting gene frequency. Mutation - types and causes - Gene mutation – chromosomal aberration. Fine structure of the gene – Cistron, recon, muton.

- 10

hrs

Books for Study

1. Verma P.S. & Agarwal V.K. (1991) Cytology. S.Chand & Co, New Delhi
2. Verma P.S. and Agarwal V.K. (2004) – Genetics, S.Chand & co. New Delhi.
3. Dalela R.C., and Verma S.R. 1970, A text book of Genetics, Jaiprakash Nath and Company, Meerut.

Books for Reference

1. De Robertis E.D.P. & De Robertis E.M.F. (1988) Cell and Molecular Biology.
2. Swanson C.P.(1990). The Cell – 8th Edn. Prentice Hall of India Pvt. Ltd. New Delhi.
3. Hans S.S. (1986) Cell Biology – Allen & Unwin.
4. Sinnot E.W, L.C.Dunn and T.Dobzhansky, Principles of Genetics (1973) 4th Edn., Tata Mc Graw Hill Pub. Co. Ltd,
- 5.Gupta P.K., 2000, Genetics, Rastogi Publications, Meerut.
- 6.Brown, T.A. 1998, Genetics – A molecular approach, Champion Hall, London.

List of Journals

1. [The Journal of Cell Biology](#)
2. [Nature Reviews Molecular Cell Biology](#)
3. [Nature Cell Biology](#)
4. [Trends in Cell Biology](#)
5. [Journal of Genetics - Springer](#)
6. Nature Genetics
7. Human Molecular Genetics

List of Websites

1. <https://www.nature.com> › nature cell biology
2. <https://www.edx.org> › learn › molecular-biology
3. <https://www.genome.gov> › about-genomics › teaching-tools › Genomics-
4. <https://www.genetics.org>

Course Outcomes:

Upon completion students should be able to

CO5CO1	understand the morphology, structure, and functions of cell and cell organelles
CO2	apprehend the molecular structure of chromosomes and nucleic acids.
CO3	comprehend the role of hybrid crosses inheritance and blood grouping.

- CO4** realize the necessity for mapping of chromosomes, sex determination and sex-linked inheritance in man.
- CO5** interpret cytoplasmic inheritance and mutation in Man and other organisms.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	2	2
CO4	3	3	2	2	2
CO5	3	3	3	3	3
AVERAGE	3	3	2.6	2.6	2.6

SEMESTER -III
CORE PAPER - 6- BIOTECHNOLOGY

Total Hrs: 60
Credits : 4

Course Objectives

1. To study and understand the basics of biotechnology
2. To understand the industrial applications of biotechnology.
3. To learn the techniques in biotechnology for conservation of environment.

UNIT – I INTRODUCTION

Origin and Definition – Scope ,history and Importance of Biotechnology – Tools in Biotechnology – recombinant DNA technology – Restriction Enzymes – Gene cloning – Cloning Vectors – Plasmids, Phages, Cosmids –Polymerase chain Reaction – CDNA Library – Electroporation and Microinjection.

-10 hrs

UNIT - II ANIMAL BIOTECHNOLOGY

Animal tissue culture – In vitro fertilization – embryo transfer in man and Cattle – Transgenic animals – Medical Biotechnology: Production of health care products – Hybridoma – Monoclonal anti bodies – hormone production .

-10 hrs

UNIT – III PLANT BIOTECHNOLOGY

Role of Nif and Nod genes – Transgenic plants – Plant vectors – Biosafety – Ecological, Social, Legal Issues regarding Handling of transgenic Plants.

-10 hrs

UNIT – IV INDUSTRIAL BIOTECHNOLOGY

Bioreactors – Fermentation process – Fermentation Industry – Microbial Enzymes and their application – Products of Microbial Fermentation – Biogas Production – Biofertilizers – Bioinsecticides. Application of genetically engineered bacteria.

-15 hrs

UNIT – V ENVIRONMENTAL BIOTECHNOLOGY

Renewable Energy – Energy and Fuel production – Biomass source of energy – Solid waste management – Vermi composting process and application – Bioremediation – Hydrocarbons, Industrial wastes and Xenobiotics.

- 15

hrs

Books for Study

1. F.C. Dubey - Biotechnology, 2005, U. Satyanarayanan - Ref. Biotechnology, 2005.
2. Biotechnology by V. Kumaresan

Books for Reference

1. **Biotechnology (2012)**
by [S. S. Purohit](#) (Author), [Shivangi Mathur](#) (Author)
2. Biotechnology by U. Sathyanarayana
3. Introduction to Plant Biotechnology H.S. Chawla
4. Applications of Environmental Biotechnology – Springer Link

List of Journals

1. Nature Biotechnology
2. Journal of Biotechnology
3. Biotechnology and Bioengineering
4. Applied Microbiology and Biotechnology
5. Critical Reviews in Biotechnology

List of Websites

1. <http://www.bio.com/resedu/educat..>
2. <http://www.biotechnology.gov.au/>
3. www.brsi.in
4. <http://www.bio.com/resedu/educate2.html>.
5. <http://www.biotech.wisc.edu>.

Course Outcomes:

Upon completion students should be able

- CO1** understand the principles of biotechnology.
- CO2** evaluate the role of biotechnology in agriculture.
- CO3** assess the extensive application of biotechnology in human health.
- CO4** develop tools and techniques to increase the production and conserve environment.
- CO5** create and find employment in biotechnology industries.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	2	3	3	3
AVERAGE	3	2.8	2.8	3	3

SEMESTER - IV
CORE PAPER 7- BIOPHYSICS & BIOSTATISTICS

Total hrs : 90
Credits : 4

Course Objective:

1. To learn the basic principles of biophysics
2. To understand the applications of biostatistics.
- 3.

UNIT I

Biophysics : Scope of Biophysics: Colloids – Description, types and properties, Electrokinetic properties, Tyndall effect, surface tension Brownian movement, filtration, osmosis, dialysis and Adsorption. Laws of thermodynamics.

- 15 hrs

UNIT II

Bioenergetics, ATP - Energy and its forms - free energy- Enthalpy and Entropy - Redox potential, redox coupling and ATP bioenergetics. Structure of atom, macromolecules and intermolecular forces. Types of bonds - Hydrogen bond, disulphide bond, covalent bonds and Electrostatic bond.

- 15

hrs

UNIT III

Biostatistics: Data Collection – Sources of Primary and secondary data – Classification and Tabulation, Organization of data: Individual, discrete frequency series – Types of variables – Derived variables.

- 20 hrs

UNIT IV

Diagrammatic Representation of Data – Bar diagram, Pie diagram, Histogram, Frequency polygon, Frequency Curve, Ogive, Pictograph, Scatter diagram.

- 20 hrs

UNIT V

Measurement of Central tendency – Mean, Median and Mode, Standard deviation, correlation and regression.

-20 hrs

Books for Study

1. Das, D. 1996, Biophysical and Biological Chemistry, Academic Publishers, Kolkata.
2. Subramanian, M.A. 2005, Biophysics, Principles and Techniques, M.J.P. Publishers, Chennai
3. Upadhyay, Upadhyay and Nath, K. 1993. Biophysical Chemistry. Himalaya Publishing House.
4. Gurumani, N. 2004, Introduction to Biostatistics, M.J.P. Publishers, Delhi

Books for Reference

1. Daniel, M. 1992, Biophysics Biologist, Wiley International, New Delhi.
2. Das, D, and Das, A. 2004, Statistics in Biology and Psychology Academic Publishers, Kolkata.
3. Ramakrishnan, P. 1996, Biostatistics, Saras Publications, Nagercoil.
4. Sokal, R.J. and Rohlf, S.J. 1981, Introduction to Biostatistics, W.H. Freeman, London.

List of Journals

1. Journal of Biometrics & Biostatistics
2. Journal of Biostatistics
3. The International Journal of Biostatistics
4. Biostatistics
5. Biometrika
6. Epidemiology, Biostatistics and Public Health
7. Biophysical Journal
8. Cell Biochemistry and Biophysics

List of Websites

1. <https://www.niser.ac.in> › sbs › course › biophysics-and-biostatistics
2. <https://en.wikipedia.org> › wiki › Biostatistics
3. <https://www.biophysics.org> › ... › Additional Education Resource
4. <https://www.nature.com> › subjects

Course Outcomes:

Upon completion students should be able to

- CO1** apply principles of biophysics in understanding various phenomenon in biology.
- CO2** design and establish techniques for biological experiments.
- CO3** understand the forms of energy and bonds.
- CO4** apply statistics in analysing bio variables.
- CO5** validate biological data.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	2	2	3	3	3
CO3	2	1	1	2	3
CO4	3	3	2	3	3
CO5	3	3	3	3	3
AVERAGE	2.6	2.4	2.4	2.6	3

**CORE 8 - PRACTICAL II
SEMESTER III & IV**

**CELL & MOLECULAR BIOLOGY , GENETICS, BIOTECHNOLOGY ,
BIostatISTICS AND BIOPHYSICS**

**Total Hours: 90
credits :4**

Course Objectives:

1. To study the principles of biophysics molecular biology, genetics in biology.
2. To apply the principles of statistics in biological data analysis.
3. To apply the principles of statistics in biological data analysis.

CELL AND MOLECULAR BIOLOGY

1. Microscopy – Dissection and Compound Microscope
2. Cell Measurements – Ocular and stage micrometers.
3. Preparation of Cells - Squamous epithelium and Barr body
4. Camera lucida
5. Mitosis – onion root tips
6. Meiosis – Grasshopper testis
7. Total count of RBC
8. Total count of WBC
9. Differential Count of WBC.
10. Spotters - Study of prepared slides of Histology
 - a. Bone T.S
 - b. Cardiac muscle
 - c. Striated muscle
 - d. Non striated muscle
 - e. Columnar Epithelium.

GENETICS

1. Identification of Drosophila mutants – white eye, ebony body, vestigial wing, bar eye .
2. Identification of Drosophila - normal male and female.
3. Mounting of polytene chromosomes – Dipteran flies.
4. Study on Normal karyotype - male and female, Down syndrome, Turner and Klinefelter's

BIOTECHNOLOGY

1. Qualitative Isolation of DNA(Demonstration)
2. Electrophoretic separation of DNA (Demonstration)
3. PCR (Demonstration)
4. Preparation of culture medium (Demonstration)

BIO STATISTICS

1.Frequency distribution of the given samples to find out Mean, and Standard Deviation for a biological data.

BIOPHYSICS

1. Demonstration of phenomenon of Osmosis.
2. Preparation of Normal , molar ,percent and parts solutions.

Books for Reference

1. **Principles and Practice of Biostatistics - E-book Kindle Edition**
by [B Antonisamy](#), [Prasanna S. Premkumar](#), and [Solomon Christopher](#).
2. Introduction to Experimental Biophysics: Biological Methods for Physical Scientists:
Volume 2 (Foundations of Biochemistry and Biophysics) by [Jay L. Nadeau](#)

Course Outcomes:

Upon completion students should be able to

- CO1** apply biophysical principles in understanding properties of life.
- CO2** understand the principles of analytical instruments.
- CO3** learn qualitative estimation techniques in biology
- CO4** to identify various mutations in insects and Man.
- CO5** relate statistical methods to validate biological data.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	3
CO2	3	2	3	3	3
CO3	3	3	3	3	3
CO4	3	3	2	3	3
CO5	3	3	3	3	3
AVERAGE	3	2.8	2.6	2.8	3

SEMESTER V

CORE PAPER 9: DEVELOPMENTAL BIOLOGY

Total Hrs : 75

Credits :4

Course Objectives

1. Understand the scope of developmental biology
2. understand the basic concepts in embryology
3. analyse and learn the mechanism of organogenesis.

UNIT I

Theories: Preformation, Epigenetic, Recapitulation and Germplasm – Gametogenesis: Spermatogenesis - Types of Sperm- Morphology of sperm. Oogenesis, Types of eggs and egg membranes .

- 15 hrs

UNIT II

Mechanism and Physiology of Fertilization – Acrosomal reaction, cortical reaction , physiological and biochemical changes, significance – Cleavage patterns, planes and laws of cleavage-Fate maps in Frog and Chick – Embryogenesis of Frog and Chick.

- 15 hrs

UNIT III

Organogenesis: Development of Eye, brain, Heart , Ear in frog –Extra embryonic membranes in chick. Placentation in mammals.

- 15 hrs

UNIT IV

Parthenogenesis: Natural and Artificial- Regeneration: Mechanism and types , Gradient theory, Organisers and mechanism of Induction – Experimental embryology: Nuclear transplantation.

- 15 hrs

UNIT V

Human reproduction – Puberty, Menstrual cycle and Menopause – Infertility – IVF – Test tube babies – Stem cell research and its significance.

- 15 hrs

Books for Study

1. Verma, P.S. and Agarwal, V.K., 2000, Chordate Embryology, S.Chand & Co., New Delhi
2. Arumugam.N 2004. A Text book of Chordate Embryology, Saras Publication

Books for Reference

1. Balinsky, B.I., 1981, An Introduction to Embryology, Holt Saunders, New York.
2. Berrill, N.J., 1986, Developmental Biology, Tata McGraw Hill Publication Co Ltd. New Delhi.
3. Patten, B.M., 1958, Foundations of Embryology, McGraw Hill, New York.
4. Saunders, J.W., 1982 Developmental Biology – Patterns and Principles, Macmillan, New York.

List of Journals

1. Developmental Biology
2. The International Journal of Developmental Biology
3. Genes & Development

List of Websites

1. <https://www.nature.com › subjects>
2. 11e.devbio.com
3. https://www.embl.de › research › units › dev_biology
4. <https://www.journals.elsevier.com › developmental-biology>

Course Outcomes:

Upon completion students should be able to

- CO1** understand the process of reproduction and egg types
- CO2** grasp the mechanism of fertilization in animals.
- CO3** comprehend the development of organs in animals.
- CO4** apply and experiment on various processes like parthenogenesis, regeneration and nuclear transplantations.

CO5 learn the basics of human reproductive cycles, infertility and its significance

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	2
CO2	2	2	1	2	2
CO3	3	3	2	3	3
CO4	3	1	2	2	2
CO5	3	1	2	2	3
AVERAGE	2.8	2	1.8	2.2	2.4

SEMESTER V
CORE PAPER 10 -MICROBIOLOGY AND IMMUNOLOGY

Total hrs: 75

Credits : 4

Course Objective

1. Understand the basic concepts of microbiology.
2. Study the basic principles of immunology

UNIT I

History and Scope of Microbiology; Classification of Microorganisms; Salient features of Bacteria, Virus, Actinomycetes, Fungi; Structure and Reproduction of Viruses. (T4 phage and HIV) Prions – Bacterial growth and nutritional requirements; Culture of microorganisms – Types of Culture media, Preparation and maintenance of culture media. Reproduction in Bacteria – Conjugation, Transformation, Transduction.

- 15 hrs

UNIT II

Diary Microbiology: Pasteurization – Milk products – Curd, butter and Cheese. Food Microbiology: Fermented food, Food spoilage, Food Poisoning, Physio-Chemical methods in food preservation. Water Microbiology: Coliform bacteria and technique.

- 10 hrs

UNIT III

Study of Common bacterial and viral diseases of man – Causative organisms, mode of transmission, pathogenicity, symptoms & their preventive measures. Diseases of Gastro – Enteric System – Cholera, Typhoid & Viral Hepatitis, Respiratory System – Diphtheria,

Pneumonia, Tuberculosis. Nervous System – Leprosy, Tetanus, Polio and Rabies. Genital System – Gonorrhoea and Syphilis, Viral Cancer and AIDS. -

15hrs

UNIT IV

Immune System – Types of Immunity – Innate and acquired Immunity: Passive and active; Lymphoid organs – Primary and Secondary Organs, GALT & BALT. Lymphocytes – Sub-Population of T&B Cells; Antigens – Types, structure and functions; Vaccines – Preparations and Immunization; Immunization scheduled. Recognition of Antigen, processing of Antigen. Antigen presentation. Immunoglobulin - Types structure and function. Immune response – Cell mediated Immune response. - 25

hrs

UNIT V

Humoral Immunity and Cell Mediated Immunity – Complements – Components – Mode of Activation – Classical and Alternate Pathway – MHC and HLA – Structure and Functions, Hypersensitivity – Types of hypersensitivity Immune Techniques – Principles of Precipitation – VDRL slide test, Double Immuno diffusion and Immunoelectrophoresis – ELISA, Radio Immuno Assay.

- 15 hrs

Books for Study

1. Ananthanarayanan, R. & C.K. Jayaram Panicker, 1990. Text Book of Microbiology, Orient Longman.
2. Chakravarty A.K. (1996) Immunology, Tata Mc Graw, New Delhi.

Books for Reference

1. Sharma, P.D., 1998, Microbiology, Rastogi Publications.
2. Mani, A., Narayanan, L.M. Selvaraj, A.M., & N. Arumugam (1996)
3. Pelczar, M.J. (2000) Microbiology, McGraw Hill Book Company, New Delhi.
4. Meena Kumari, S. 2005, Microbial Physiology, M.J.P. Publishers, Chennai.
5. Roitt, I. 1987, Essential Immunology, P.G. Publishing Pvt. Ltd. New Delhi.
6. Kubly, T. (1994) Immunology, P.G. Publishing Pvt. Ltd. New Delhi.

List of Journals

1. Microbiology
2. Applied and Environmental Microbiology
3. Microbiological Research
4. Journal of Immunology
5. Immunobiology
6. Nature Immunology

List of Websites

1. <https://microbiologyonline.org>
2. www.bioedonline.org › lessons-and-more › resource-collections › microm.
3. <https://www.scienceprofonline.com> › instructors-corner-vmc
4. <https://www.jimmunol.org>
5. <https://www.nature.com> › nature immunology

Course Outcomes:

Upon completion students should be able to

- CO1** comprehend the structural organization of microbes and their culture.
- CO2** role of beneficial and pathogenic microorganisms in food industry.
- CO3** identify the pathogens causing diseases in Man
- CO4** understand the role of immune system in human health.
- CO5** apply various techniques for diagnosis of human diseases

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	2	3	3	3
CO5	2	2	3	3	3
AVERAGE	2.8	2.4	2.6	3	3

V SEMESTER
CORE PAPER 11- ENVIRONMENTAL BIOLOGY

Total hrs: 75
Credits :4

Course Objectives:

1. To understand the basic concepts of environment
2. To study the various habits and habitats
3. To study the conservation strategies.

UNIT I

Introduction: Scope-concept-Branches of Ecology: Autecology, synecology-Abiotic factors- Water, Soil, Temperature , Air and light- Biotic factors – intra specific and inter specific animal relationships – symbiosis, Commensalism, Mutualism, Antagonism and competition. Ecosystem – Pond ecosystem – Food Chain – Food Web – Trophic Levels – Energy flow – Ecological Pyramids – Pyramid of Biomass, Number and energy.

-15

hrs

UNIT II

Population ecology - Definition – characteristics – Density, Natality, Mortality, Population fluctuation, dispersal, Age pyramid, growth forms - Population equilibrium - Regulation. Community ecology – Types of Communities - characteristics of community. Stratification –

Ecotone – edge effect – Ecological niche – Ecological succession.

- 15 hrs

UNIT III

Habitat ecology: Fresh water habitat – lentic and lotic – terrestrial habitat: Types of forests in India – Estuarine ecology – types, fauna and adaptation – Mangrove ecosystem – ecological conditions – mangroves of India – Desert: fauna and adaptations.

- 15 hrs

UNIT IV

Applied ecology: Pollution – pollutants and types – Air, water and noise-Green house effect – Ozone layer and its significance, Global warming, Acid rain-Hiroshima and Nagasaki – Bhopal tragedy – oil pollution.

- 15

hrs

UNIT – V

Wild life Management : Preservation- laws enforced – sanctuaries, National parks. Natural resources management , Renewable – forest, fishes, crops. Non renewable – Fossil fuels , metals and other minerals. Women's role in Ecology.

- 15

hrs

Books for Study

1. Verma P.S. and Agarwal V.K. 2000, Environmental Biology, S.Chand & Co, New Delhi.

Books for Reference

1. Odum, E.P. (1983) Basic Ecology, Saunder's College Publishing New york.
2. Clarke, G.L.(1954) Elements of Ecology, John wiley & Son Inc. New York London 534 pp.
3. Kotpal, R.L. and N.P.Bali 1986 Concepts of Ecology, Vishal Publications Delhi.
4. Ananthakrishnan, T.N. and S.Viswanathan, Principles of Animal Ecology
5. Bandopadhyay, J. India's Environment crisis and response, Nataraj Publishers, Dehra Dun.

List of Journals

1. Journal of Environmental Biology
2. Open Journal of Environmental Biology
3. Journal of Environmental Biology - SCImago

List of Websites

1. www.jeb.co.in

2. https://www.researchgate.net › journal › 0254-8704_Journal_of_Environ..
3. <https://www.scimagojr.com › journalsearch>

Course Outcomes:

Upon completion students should be able to

CO1: .

CO2:

CO3:

CO4:

CO5:

- CO1** comprehend the various trophic levels in food chain and patterns of energy flow
- CO2** understand population equilibrium and the factors related
- CO3** analyse different ecosystems and associated adaptations.
- CO4** identify types and levels of pollution affecting the living systems.
- CO5** Conserve environment by wildlife management and renewable resources

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	2
CO2	3	3	2	2	2
CO3	3	3	2	3	2
CO4	2	3	2	2	2
CO5	3	3	1	3	3
AVERAGE	2.8	3	2	2.6	2.2

SEMESTER V

CORE PAPER 12- EVOLUTION AND ANIMAL BEHAVIOUR

Total hrs: 60

Credits : 4

Objective:

1. To understand the basic concept of evolution
2. To study the theories related to origin of life
3. To learn the behavioural patterns in animals.

UNIT I

Origin of life, Lamarck and his principles , Darwin and his principles . Evidence for evolution from Morphological, physiological, biochemical, embryological . Industrial Melanism. Modern theory of evolution.

-12 hrs

UNIT II

Geological time scale. Genetic drift and evolutionary significance. Living fossils . Speciation – species concept – sub species and sibling species, allopatric and sympatric speciation. Isolating mechanism – Types.

-12

hrs

UNIT III

Evolution of man – Ancestry of man (Dryopithecus, Australopithecus, *Homo habilis*, *H. erectus*, *H. neanderthalensis*, the Cromagnon man, Modern man - Socio cultural evolution. Barriers – continental drift. Extinction – types and causes.

-12

hrs

ANIMAL BEHAVIOUR

UNIT IV

Animal behaviour - Introduction – Definition – stereotype and aquired behaviour, role of cerebral cortex in behaviour. Types of behaviour- Instinctive behaviour. Intelligence - learning, imprinting, reasoning. communication – touch and visual communication. Human gestures.

- 12

hrs

UNIT V

Motivation - Effects of motivation on behavior – Biological , hunger, aggressive feeding behaviour . Social behaviour - Insects and Birds . Periodicity and biological clock. Role of pheromones in behaviour, Mimicry and colouration

- 12

hrs

Books for Study

1. Verma, P.S. and Agarwal, V.K., 2002, Concept of Evolution, S.Chand and Company Limited, New Delhi.
2. Arumugam, N., 2002, Organic Evolution, Saras Publication, Nagercoil.

Books for Reference

1. Minkoff E.C. 1983, Evolutionary biology, Addison Wesley Publishers
2. Dobzhansky, T., Ayala, F.J., Stebbins, G.L. and Valentine, J.W., 1977, Evolution, W.H.Freeman and Co., San Francisco.
3. Dobzhansky, Th. Genetics and Origin of Species 1951, Columbia Uty. Press.
4. Stansfield, W.D., 1977, The Science of Evolution, Collier Macmillan, London.
5. Colbert. E.H. 1970, Evolution of the Vertebrates, Wiley Eastern Edn
6. Davis,D.E.1970. Integral Animal Behaviour, Macmillan, New York.
7. Desmond Morris, 1990. Animal Watching (Field guide), Crown Pub Co. London

List of Journals

1. Evolution
2. Journal of Evolutionary Biology
3. Molecular Biology and Evolution
4. Animal Behaviour Journal
5. Journal of Animal Behaviour and Biometerology

List of Websites

1. <https://onlinelibrary.wiley.com> › journal
2. <https://onlinelibrary.wiley.com> › journal
3. <https://www.hindawi.com> › journals › ijeb
4. <https://www.journals.elsevier.com> › animal-behaviour
5. <https://www.sciencedirect.com> › journal › the-british-journal-of-animal-beha...

Course Outcomes:

Upon completion students should be able to

- CO1** appreciate the theories on the origin of life.
- CO2** comprehend geological time scale and the mechanism of speciation.
- CO3** realize the evolution of Man and the concept of extinction.
- CO4** recognize the various types of behaviour in animals.
- CO5** grasp the role of nervous system and hormones in behavioural patterns

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	2
CO2	3	3	2	2	2
CO3	3	3	1	2	2
CO4	3	3	3	2	2
CO5	3	1	2	2	1
AVERAGE	3	2.6	2	2	1.8

SEMESTER V
ELECTIVE - I
MEDICAL LABORATORY TECHNOLOGY & BIOCHEMISTRY

Total hrs : 75

Credits:5

Course Objectives

- 1.To study the scope of Medical lab technology.
2. To understand the application of MLT in human health.
3. To know the various nutrients and to understand their metabolic pathway

UNIT I

Scope of Medical Laboratory techniques . General Lab apparatus and glasswares used in laboratories. Cleaning and sterilization of laboratory instruments. Blood collection procedures. Bleeding time and clotting time. Total count of RBC , Total count and differential count of WBC. Estimation of Haemoglobin and ESR. -

15hrs

UNIT II

Analysis of urine samples – Microscopic examination for deposits, RBC, casts and pus cells. Qualitative estimation of sugar, albumin, bile pigment and bile salts in urine sample. Pregnancy test. Clinical diagnosis of viral diseases such as measles, Hepatitis ; Bacterial diseases such as Tuberculosis, tetanus, diphtheria, cholera and typhoid; Protozoans diseases such as Amoebic dysentery, malaria, Helminthes diseases such as Ascaris, Filariasis. -

15 hrs

BIOCHEMISTRY:

UNIT III

Classification, structure and functions of Amino acids , proteins ,carbohydrates and lipids. Vitamins - Water soluble and fat soluble vitamins occurrence, functions and deficiency diseases. Water - The basic molecule of life - molecular structure -physical and chemical properties- density - specific heat. - 15

hrs

UNIT IV

Enzymes - Classification, Properties, Chemical nature and mechanism of enzyme action - Factors affecting enzyme action - Enzyme kinetics - Enzyme inhibition. -15 hrs

UNIT V

Metabolic pathways of Carbohydrates – Glycogenesis, Glycogenolysis, Glycolysis, Krebs's cycle, and gluconeogenesis, protein metabolism – Deamination, Transamination. Lipid metabolism – Oxidation of fatty acids. - 15 hrs

Books for Study

1. Medical Laboratory Technology by Ramnik Sood, Japee brothers, New Delhi.
2. Textbook of Medical Laboratory Technology Vol 1 & 2 by [Godkar P.B.](#)
3. Fundamentals of Biochemistry for Medical Students by Ambika Shanmugam
4. Fundamentals of Biochemistry by J.L.Jain

Books for Reference

1. Biochemistry by U. Satyanarayana
2. Baker F.J. and Silvertown R.E. Introduction to Medical Laboratory Technology.
3. K.L. Mukherjee Medical Laboratory Technology Vol. I, II & III.
4. Prof. C.R. Maiti Medical Laboratory Technology – New Central Book Agency Pvt Ltd. Kolkata.

List of Journals

1. [International Journal of Medical Laboratory Research](#)
2. Medical Laboratory Technology Journal
3. Journal of Medical Laboratory and Diagnosis
4. Journal of Biological Chemistry
5. The International Journal of Biochemistry
6. Biochemical Journal

List of Websites

1. <https://www.ijmlr.com>
2. <https://doaj.org> › toc
3. <https://academicjournals.org> › journal › JMLD
4. <https://academic.oup.com>

5. <https://www.elsevier.com> › life-sciences › journals

6. <https://www.omicsonline.org> › biochemistry-journals-india

Course Outcomes:

Upon completion students should be able to

- CO1** understand the various techniques in blood sample analysis.
- CO2** analyse body fluids for diagnosis of various human diseases
- CO3** comprehend the structure and functions of macromolecules, vitamins and their deficiency diseases.
- CO4** realize the properties, nature and mechanism of enzyme functions.
- CO5** appreciate the metabolic pathways and metabolism of macromolecules.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	3	3	3	3	3
CO3	3	2	2	1	1
CO4	2	2	2	2	1
CO5	3	3	3	1	3
AVERAGE	2.8	2.4	2.6	2	2.2

SEMESTER VI
CORE PAPER 13- ANIMAL PHYSIOLOGY

Total hrs : 135 hrs
Credits:5

Course Objectives:

1. To study the basics of metabolism and other physiological activities.
2. To understand various rhythms and regulations associated.
3. To know the mechanism of actions of structural units of all organs

UNIT I

Introduction – Scope and fields of Physiology, Digestion – Intracellular and extracellular. Digestive enzymes and physiology of digestion, Absorption. - 15 hrs

UNIT II

Respiration – Respiratory pigments – properties and functions Transport of oxygen and carbon dioxide by blood, Anaerobiosis. **Circulation** – Composition, properties and functions of blood, Blood coagulation – Intrinsic and extrinsic pathways, Types of hearts, Human cardiac cycle, pacemaker and cardiac rhythm, regulation of heart beat, ECG and blood pressure. - 20 hrs

UNIT III

Excretion – Kinds of excretory products, Ornithine cycle, Structure of a mammalian kidney and nephron, Mechanism and hormonal regulation of urine formation.
Muscles – Types of muscles and muscle proteins, physical and chemical properties of contraction. Isometric and isotonic contractions, Theories of contraction, Muscle twitch, Tetanus, Clonus, Fatigue. - 20 hrs

UNIT IV

Nervous system – Structure and types of nephrons, Origin and conduction of nerve impulse, Synaptic transmission, Neurotransmitters, Autonomous nervous system.

Receptors – Mammalian eye and physiology of vision. Mammalian ear and physiology of hearing. - 20

hrs

UNIT V

Endocrine glands – Structure, secretions and hormonal functions of Pituitary, Thyroid, Parathyroid, Adrenal, Pancreas and sex organs. Gastrointestinal Hormones. - 15

hrs

Books for Study

1. Parameswaran, Ananthakrishnan and Ananthasubramanian, 1975, Outlines of Animal Physiology, S. Viswanathan, Printers and publishers, Pvt. Ltd., 329 pp.
2. Verma P.S., B.S. Tyagi, & V.K. Agarwal, 1980, Animal Physiology, S.Chand & Comp. Ltd., New Delhi.
3. Goel, K.A. & K.V.Sastry, 1984. A Text Book of Animal Physiology, Rastogi Publ. Meerut

Books for Reference

1. William Hoar, 1976, General and Comparative Physiology, Prentice Hall of India Pvt. Ltd., New Delhi.
2. James A. Wilson 1972. Principles of Animal Physiology, Macmillan, New York.
3. Ladd Prosser, C. & Frank A. Brown JR, 1973, Comparative Animal Physiology, W.B. Saunders, Toppan.
4. Donnell Turner, C., 1966, General Endocrinology, Saunders, Toppan.
5. Ghosh. H.N. 1984, Human Physiology, The new Book Stall, Kolkata.

List of Journals

1. [Journal of Animal Physiology and Animal Nutrition](#)
2. Animal Physiology
3. Animal physiology - Latest research and news | Nature
4. Journal of Animal Physiology and Animal Nutrition - SCImago

List of Websites

1. <https://onlinelibrary.wiley.com> › journal
2. <https://www.omicsonline.org> › animal-physiology-journals-articles-ppts-list
3. <https://www.nature.com> › subjects
4. <https://www.scimagojr.com> › journalsearch

Course Outcomes:

Upon completion students should be able to

- CO1** understand the mechanism of digestion and absorption
- CO2** appreciate the role of respiratory pigments in transport of oxygen
- CO3** comprehend the properties and functions of blood and heart.
- CO4** apprehend the cycles involved in excretion and properties, functions of muscle.
- CO5** realize the coordination of nervous tissues and sense organs. Also to understand the role of hormones

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	2
CO2	3	3	2	3	2
CO3	3	3	2	3	2
CO4	3	3	2	3	2
CO5	2	3	2	3	2
AVERAGE	2.8	3	2.2	3	2

SEMESTER - VI
ELECTIVE II
ECONOMIC ZOOLOGY

Total hrs :90
Credits : 5

Course Objectives

1. To understand the concepts of pest management.
2. To explore the cultivable breeds of animals for sustainable growth.
3. To develop entrepreneurial skills through aquaculture and animal farming.

UNIT I

Pest - Definition and causes for insects attaining pest status. Insect pests - Damage and loss due to pests - any two pests of the cash crops, cereals /pulses stored grains , vegetables / fruits - pest control strategies , I.P.M. - 15 hrs

UNIT II

Beneficial insects- Honey Bee , Common species, by products of apiary, economic importance . Silk worm, common cultivable species, types of silk, economic importance of silk and its by products - Lac insect, economic importance of lac. - 20 hrs

UNIT III

Aquaculture - definition , cultivable species, types of aquaculture - pisciculture (fresh water , marine , brackish). - crustacean, osyter and other molluscans, mariculture , seaweeds - by products - preservation and processing of aquaculture products - marketing potential of aquaculture products. - 20 hrs

UNIT IV

Fowl - economically important breeds for egg and meat - farming , diseases and prevention - by products - economic importance of piggery - economically important breeds- economic importance - 20 hrs

UNIT V

Diary – economically important breeds for milk - economic status and importance. Sheep farming - economically important breeds for wool and meat - economic importance

- 15 hrs

Books for Study

1. Elements of Economic Entomology 8th Edition (Elements of Economic Entomology)
by David B. Vasantharaj

Books for reference

1. Encyclopaedia Of Economic Zoology (Set Of 2 Vols.)
by A. A. Khan
2. Elementary Textbook of Economic Zoology and Entomology by Rennie
3. Economic Zoology: An Introductory Text-book in Zoology, with Special ...
by Herbert Osborn

List of Journals

5. Journal of Entomology and Zoology Studies.
6. [Journal Rankings on Animal Science and Zoology - SCImago](#)
7. International Journal of Zoology and Applied Biosciences
8. Pest management and economic zoology.

List of Websites

8. <https://www.scimagojr.com> › journalrank
9. www.worldcat.org › title › pest-management-and-economic-zoology
3. <https://www.ijzab.com>

Course Outcome

Upon completion Students should be able to

- CO1** know the economic importance of animal farming.
- CO2** understand the techniques in animal husbandry
- CO3** gain more information on economic aspects of zoology.
- CO4** practice methods for better livelihood.
- CO5** become entrepreneurs and create jobs.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	3
CO2	3	3	3	3	3
CO3	3	3	2	3	3
CO4	3	3	2	3	3
CO5	3	2	2	3	3
AVERAGE	3	2.8	2.2	3	3

SEMESTER VI
ELECTIVE III
PUBLIC HEALTH AND HYGIENE

Total hrs : 75

Credits : 5

Course Objectives

1. To understand the importance of hygienic practices.
2. To create awareness about healthy living.
3. To impart knowledge about pathogenic infections and lifestyle diseases.

UNIT I

Scope of Public Health and Hygiene – Concepts of Health and Disease – History of Public Health in India. Nutrition and Health: Classification of foods – Nutritional deficiencies – Vitamin deficiencies – Balanced diet – Nutritional requirements of special groups.

- 15 hrs

UNIT II

Environment and Health: Water-sources, Pollution, purification – water quality standards. Air: Ventilation – pollution - noise pollution - radiation effects - solid waste and excreta disposal - sewage treatment.

- 10

hrs

UNIT III

Communicable diseases: Respiratory infections: Measles, Rubella, Mumps, Diphtheria. Intestinal infections: Poliomyelitis, Cholera, Typhoid, Amoebiasis. Arthropod infections: Malaria, Filariasis, Dengue. Zoonosis: Rabies, Plague, Japanese encephalitis. Surface infections: Tetanus, Leprosy, STD and AIDS.

-15 hrs

UNIT IV

Non Communicable Diseases: Coronary Heart Disease-Hypertension-Diabetes-Obesity-Blindness –Stroke. Occupational Health Hazard: Physical, Chemical, Mechanical, Biological and Psychological. Mental Health: Causes of mental ill health-alcoholism and Drug dependence.

- 20 hrs

UNIT V

Health Education :Health planning in India – Health programmes in India – WHO –Non-governmental Voluntary Health Organizations . First aid and Nursing: Methods – Dressing – Care – Duties – Preparations.

- 15

hrs

Books for study

1. Public Health and Hygiene by V. Kumaresan, R. Sorna Raj,

Books for Reference

1. Park and Park, 1995.Text Book of Preventive and Social Medicine.M/S Banarsidas Bhanot Publishers, Jabalpur.
2. Verma,S. 1998. Medical Zoology, Rastogi Publications, New Delhi.

List of Journals

1. International Journal of Hygiene and Environmental Health
2. Journal of Healthcare and Hygiene - iMedPub LTD
3. Journal of Public Health Hygiene and Safety

List of Websites

1. <https://www.journals.elsevier.com › international-journal-of-hygiene-and-e...>
2. www.annexpublishers.com › journals › journal-of-public-health-hygiene-a.
3. www.imedpub.com › journal-healthcare-hygiene
4. <https://www.jpnh.org>

Course Outcome

Upon completion Students should be able to

- CO1 understand the importance of nutrition in health.
- CO2 comprehend the impact of pollution on human health.
- CO3 distinguish between communicable and non-communicable diseases.
- CO4 recognize lifestyle diseases
- CO5 appreciate and understand the role of various human health organizations in maintenance of health.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	2	3	3	3	3
CO3	3	3	2	3	3
CO4	3	2	3	3	3
CO5	2	2	2	3	3
AVERAGE	2.6	2.6	2.6	3	3

PRACTICAL - III
SEMESTER V & VI
CORE PAPER 14 - ANIMAL PHYSIOLOGY, BIOCHEMISTRY ,
DEVELOPMENTAL BIOLOGY

Total hrs:90

credits: 5

Course Objectives:

1. To study the physiological systems of animals.
2. To analyse the responses of parameters against environmental stress.
3. To study the composition of macro and micro molecules and nutrients.

ANIMAL PHYSIOLOGY

1. Estimation of oxygen consumption of fish with reference to body weight.
2. Qualitative analysis of nitrogenous waste products in fish tank water, frog tank water, bird excreta and mammalian urine.
3. Amylase activity in human saliva in relation to pH.
4. Principles and uses of:
 1. Sphygmomanometer- Stethoscope
 2. Kymograph
 3. Respirometer.

BIOCHEMISTRY

1. Qualitative analysis of Proteins, carbohydrates and lipids in urine.
2. Determination of bleeding time.
3. Determination of Clotting time.
4. Estimation of ESR.

5. Estimation of haemoglobin by Haemoglobinometer.
6. Principles and uses of:
 1. Chromatography
 2. Spectrophotometer/ Colorimeter
 3. Centrifuge

DEVELOPMENTAL BIOLOGY

1. Observation of different stages of development in invertebrates –(Life cycle of any two Arthropods).
2. Early development of Vertebrate(Frog- egg, 2 cell stage, 4 cell stage , 8 cell stage , Cleavage, Blastula, Gastrula and yolk plug and chick-egg, 24, 48 hrs and 72 hrs).
3. Observation of egg and sperm mammals.
4. T.S of Testis and ovary of mammal.
5. Placenta of Sheep and Pig

Course Outcome

Upon completion students should be able to

- CO1** understand the functions of instruments used to analyse physiological systems.
- CO2** indicate the various blood parameters to diagnose abnormality.
- CO3** comprehend the interrelation among physiological processes.
- CO4** grasp the role of biomolecules in physiology.
- CO5** analyse and understand embryological stages and life cycle in various animal models.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	2
AVERAGE	3	3	3	3	2.8

**PRACTICAL - IV
SEMESTER V & VI
CORE PAPER 15 - ENVIRONMENTAL BIOLOGY,
MICRO BIOLOGY & IMMUNOLOGY**

**Total hrs:90
credits: 4**

Course Objectives

1. To analyse environmental data using various parameters.
2. To use techniques to identify microbes through laboratory procedures.
3. To analyse and identify the organisms of various habitats.

ENVIRONMENTAL BIOLOGY

1. Estimation of salinity in water sample
2. Estimation of O₂
3. Estimation of CO₂
4. Estimation of bicarbonates
5. Identification of Planktons - fresh water & marine planktons
6. Usage of Sacchis' Disc, Hygrometer, pH meter, rain gauge etc.
7. Adaptations of Aquatic and Terrestrial Animals based on study of museum specimens such as
 - a. Rocky shore fauna
 - b. Sandy shore fauna
 - c. Muddy shore animals
 - d. Flying animals
 - e. Burrowing animals

MICROBIOLOGY

1. Observation of permanent slides / photographs and identification of spotters Nostoc, Oscillatoria, Spirogyra, Mucor, Yeast, Aspergillus.
2. Identification of bacteria using Simple staining and differential staining methods.

IMMUNOLOGY

1. Blood grouping – Man
2. Lymphoid organs in any animal

Course Outcome

Upon completion students should be able to

CO1:

CO2:

CO3:

CO4:

CO5:

CO1 understand the analytical methods of essential gases of biogeochemical cycles.

CO2 describe the instruments involved and their usage.

CO3 illustrate abiotic/biotic interactions and symbiotic relationships

CO4 quantify and analyse the microorganisms in the environment.

CO5 describe the role of lymphatic organs in immunity

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	2
CO4	3	3	3	3	3
CO5	3	2	3	3	3
AVERAGE	3	2.6	2.8	3	2.8

SEMESTER III
ALLIED ZOOLOGY PAPER I

Total hrs- 45
Credits - 5

Course Objectives

1. To study functional morphology of invertebrates and chordates
2. To understand the basic organisation of invertebrates and chordates
3. To understand special adaptations

Invertebrates: Study of the following types including life history
(Classification of each type study)

Unit-I

Protozoa – Paramecium- structure - reproduction.
Porifera - Sycon- structure - canal system .
Coelentrata – Obelia-- structure - reproduction.
Platyhelminthes – Taenia solium- structure - digestive system - reproduction- life cycle-
parasitic adaptations and pathogenecity.

- 10

hrs

Unit – II

Annnelida – Earthworm-morphology ,systems and reproduction.
Arthropoda – Penaeus- morphology - digestive system- excretory system-nervous system -
reproduction- life cycle.
Mollusca – Pila- morphology - digestive system - reproduction- life cycle
Echinodermata – Star fish- morphology - digestive system -water vascular system-
reproduction.

- 10

hrs

Unit – III

Chordata – study of the following types

Prochordates – amphioxus – structure and affinities.

- 5

hrs

Unit – IV

Vertebrates – type study of shark, frog, calotes – morphology, digestive, excretory,
respiratory and urinogenital system. Life cycle.

- 10

hrs

Unit –V

Pigeon and rabbit – morphology, digestive, circulatory – structure of heart, excretory and urinogenital system - respiratory, nervous – structure of brain.

- 10

hrs

Books for study

1. Ekambaranatha Ayyar & T.N. Anantha krishnan 1992 Manual of Zoology Vol – I (Invertebrata) Part I & II Viswanathan Pvt. Ltd.
2. Ekambaranatha Ayyar and T.N. Ananthakrishnan, 1995. "A Manual of Zoology". Vol 2 (Part 1 & 2), S. Viswanathan, Chennai

Books for Reference

1. Invertebrate Zoology – Jan 2009
by [P S Verma](#) , [E L Jordon](#)
2. Chordate Zoology Paperback – Jan 2013
by [P S Verma](#) and [E L Jordan](#)

List of Journals

1. Journal of Invertebrates
2. International Journal of Science: Nature

List of Websites

1. www.earthlife.net/inverts/an-phyla.html Brief overview of all invertebrate phyla with links to information on specific groups.
2. Invertebrate – Wikipedia <http://en.wikipedia.org/wiki/Invertebrate> Foundational information on the classification, phyla, and life history of invertebrates.
3. Vertebrates – Animal Kingdom <http://animalkingdom.net/category/vertebrates/> General website on vertebrates with links to other websites for specific groups.

Course Outcome

Upon completion Students should be able to

- CO1 appreciate the diversity of lower invertebrate fauna.
- CO2 deduce the adaptation of animals to their environment
- CO3 comprehend the parasitic adaptations in higher invertebrates.
- CO4 understand the diversity of higher fauna.
- CO5 interpret the gradual evolution of chordates from invertebrates.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	3
CO2	3	3	2	3	2
CO3	3	2	2	2	2
CO4	3	3	2	2	2
CO5	3	3	2	3	2
AVERAGE	3	2.8	2	2.4	2.2

SEMESTER IV

ALLIED ZOOLOGY PAPER II

Total hrs- 45
Credits - 3

Course Objectives

1. Understand the basic structure and functions of a cell.
2. To understand the basic principles of heredity and the mechanism of inheritance.
3. understand the basic concepts in embryology, environmental biology and evolution

UNIT – I

Cell biology – structure of animal cell, structure and functions of mitochondria, nucleus, Golgi bodies

UNIT –II

Genetics – Mendelism and Mendelian laws, fine structure of gene, sex determination in man, sex linked inheritance

UNIT –III

Developmental biology – Spermatogenesis and Oogenesis.

UNIT –IV

Human physiology – digestion, respiration and excretion.
Endocrine glands – pituitary, thyroid.

UNIT –V

Environmental biology – Ecosystem, biotic and abiotic factors

UNIT –VI

Evolution – Origin of life , Darwinism and lamarkism.

Book for Study

1. Cell biology, genetics, ecology, evolution and embryology – Verma.P.S and Agarwal.V.K. S.Chand and Co. New delhi

Books for Refernce

1. Cell Biology, Verma P.S. & Agarwal V.K. S.Chand & Co, New Delhi
2. Genetics, Verma P.S. & Agarwal V.K. S.Chand & Co, New Delhi
3. Ecology, Verma P.S. & Agarwal V.K. S.Chand & Co, New Delhi
4. Evolution, Verma P.S. & Agarwal V.K. S.Chand & Co, New Delhi
5. Embryology, Verma P.S. & Agarwal V.K. S.Chand & Co, New Delhi

List of Journals

1. Nature Cell Biology
2. Nature
3. Ecology and Evolution
4. Development

List of Websites

1. <https://www.journals.elsevier.com › european-journal-of-cell-biology>
2. <https://www.nature.com>
3. <https://besjournals.onlinelibrary.wiley.com › journal>
4. <https://www.scimagojr.com › journalrank>
5. <https://onlinelibrary.wiley.com › journal>

Course Outcomes

Upon completion students should be able to

- CO1** To know the morphology, structure, and functions of cell and cell organelles
- CO2** Understand the basic principles of genetics
- CO3** Understand the process of gametogenesis.
- CO4** To know the physiology and role of hormones
- CO5** Analyse ecosystems and the factors. Appreciate the theories on the origin of life.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5

CO1	3	3	3	3	3
CO2	3	3	3	2	2
CO3	2	2	3	2	3
CO4	3	3	2	3	3
CO5	2	2	3	2	3
AVERAGE	2.6	2.6	2.8	2.4	2.8

SEMESTER IV

ALLIED ZOOLOGY PRACTICALS

DISSECTION:

1. Digestive system of Cockroach.
2. Nervous system of Cockroach
3. Digestive system of any Vertebrate (Fish)

MOUNTING:

1. Body Setae of Earthworm.
2. Mouth parts of Cockroach.
3. Mouth parts of Bed bug/honey bee
4. Mouth parts of Mosquito.
5. Shark placoid scales
6. Brain of any vertebrate

SPOTTERS:

Comment on

Entamoeba, Plasmodium, Paramecium, Sycon, Obelia colony, Obelia medusa, fasciola hepatica, Teania solium, Earthworm, Leech, Peneaus, Fresh water mussel, Pila, Starfish, Amphioxus, Shark, Rana, Naja naja, Pigeon, Rabbit.

- CO1** Have hands on experience of dissecting invertebrates and chordates
- CO2** Differentiate the structural modifications of animals
- CO3** Assess the development of adaptive features

CO4 Compare the morphological and anatomical changes in animals

CO5 To know the special features in organisms with reference to their environment

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	2.8	3	3	2.6	3

QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS)

Anna Salai, Chennai – 600 002.

**DEPARTMENT OF ADVANCED ZOOLOGY AND
BIOTECHNOLOGY**

SYLLABUS

**B.Sc. ADVANCED ZOOLOGY AND BIOTECHNOLOGY
(Branch VI a)**



CHOICE BASED CREDIT SYSTEM OUTCOME BASED EDUCATION

(Offered from the Academic year 2017 – 2018)

CONTENTS

- 20. Rules and regulations for the Programme
- 21. Programme Outcomes
- 22. Programme Specific Outcomes
- 23. Programme profile
- 24. Evaluation pattern of CA
- 25. Rubrics for CA Evaluation
- 26. Evaluation pattern for end semester
- 27. Course profile – semester I and II
- 28. Course profile – semester III and IV
- 29. Course profile – semester V and VI

Programme Outcomes

On completion of the Programme, the learner is able to:

- PO 1** Apply Practical and mathematical skill in all aspects
- PO 2** Identify quality knowledge of the subject
- PO 3** Utilize the subject knowledge and communication skills to appear for competitive exams
- PO 4** Acquire theoretical, practical and mathematical knowledge
- PO 5** Analyse the basic computational skills

Program Specific Outcomes (PSO)

The Under Graduate students of Zoology should be able to

PSO1	Acquire basic knowledge about faunal diversity. Understand the basic concepts of biology of animals and comprehend the relationship between animals and their environment.
PSO2	To relate the behaviour, physiology, cell biology, genetics, taxonomy with environment. and to analyse the relationships among animals, plants, microbes.
PSO3	Understand the structural organization of the cell, cell organelles and their

	functions. Understand the concepts of genetics, microbiology and immunology and their importance in human health.
PSO4	understand the applications of biological sciences in agriculture, health, environmental conservation and Medicine. Perform procedures as per laboratory standards in the above mentioned areas.
PSO5	comprehend the application of other basic sciences like statistic, physics and chemistry in zoology. Gain knowledge about latest trends or advancements in the specified topics and apply the knowledge of entomology in agricultural and domestic practices.

Programme Profile

From 2017-2018

Credits and Marks Consolidation – B.Sc.,

Subject Component	No. of Papers	Total Marks	Total Credits
Part I - Language	4	400	12
Part II – English	4	400	12
Total	8	800	24
Part III			
Core	15	1500	64
Elective	3	300	15
Allied	6	600	20
Total	24	2400	99
Part IV			
NME	2	200	4
Soft Skills	4	400	8
EVS	1	100	2
Value Education	1	100	2
Total	8	800	16
Part V			
Extension Activities			1
Grand Total	40	4000	140

Frame Work

Distribution of Hours, Marks and Credits for B.Sc., Advanced Zoology and Biotechnology

I B.Sc ADVANCED ZOOLOGY AND BIOTECHNOLOGY

Sem	Component	Subject Code	Title of the Paper	Credits	Hrs/Wk	Total Hours	CA	SE	Total Marks
I	Language	173301	Tamil Paper - I	3	4	60	25	75	100
	English	173801	English Paper -I	3	4	60	25	75	100
	Core	172501	Core Paper 1- Invertebrata - I	5	5	75	25	75	100
	Core	172502	Core Paper 2- Invertebrata -II	5	4	60	25	75	100
	Core Practical		Core Practical I : Invertebrata And Chordata (No Exam)	-	3	45	-	-	-
	Allied		Allied I - Paper I- Chemistry	5	3	45	25	75	100
	Allied Practical		Allied I Practicals		3	45			
	NME-1		Arts Dept	2	2	30	40	60	100
	Soft Skills-1	179001	Essentials Of Language & Communication	2	2	30	40	60	100
			Total	25	30				700
II	Tamil	173302	Tamil Paper - II	3	4	60	25	75	100

	English	173802	English Paper -II	3	4	60	25	75	100
	Core	172503	Core Paper - 3 Chordata	4	6	90	25	75	100
	Core	172504	Core Practicals- Invertebrata & Chordata	4	6	90	25	75	100
	Allied		Allied - I Paper II - Chemistry	3	4	45	25	75	100
	Allied		Allied -I Practicals	2	2	45	25	75	100
	NME- 2		Arts Dept	2	2	30	40	60	100
	Soft Skills -2	179002	Essentials of Spoken & Presentation Skills	2	2	30	40	60	100
			Total	23	30				800

II B.Sc ADVANCED ZOOLOGY AND BIOTECHNOLOGY

Sem	Component	Subject Code	Title of the Paper	Credits	Hrs/ Wk	Total Hours	CA	SE	Total Marks
III	Tamil	173303	Tamil Paper - III	3	6	90	25	75	100
	English	173803	English Paper -III	3	6	90	25	75	100
	Core	172505	Core Paper -5 Cell & Molecular Biology And Genetics	4	4	60	25	75	100
	Core	172506	Core Paper - 6 Biotechnology	4	4	60	25	75	100
	Core Practicals		Core Practical II Environmental Biology And Developmental Biology		3	-	-	-	-
	Allied		Allied - II- Paper I PBPB	5	3	45	25	75	100
	Allied Practicals		Allied II - Practicals		2	30	-	-	-
	Soft Skills-3	179003	Personality Enrichment	2	2		25	75	100
			TOTAL	21	30				600
IV	Tamil	173304	Tamil Paper IV	3	6	90	25	75	100
	English	173804	English Paper IV	3	6	90	25	75	100
	Core	172507	Core Paper - 7 Biophysics, Biostatistics	4	6	90	25	75	100

	Core	172508	Core Paper - 8 Practical II: Cell & Molecular Biology , Genetics , Biotechnology, Biostatistics And Biophysics	4	3	45	25	75	100
	Allied		Allied II - Paper II : PBPB	3	3	45	25	75	100
	Allied		Allied II - Practicals	2	2	30	25	75	100
	Soft Skills-4	179004	Paper IV – Basic Computer Skills and Applications	2	2	30	40	60	100
	EVS	174001	Environmental Studies	2	2	30	40	60	100
	Extension Activities		NSS, NCC,YRC, RRC, SPORTS, EnviroClub etc..	1					
			TOTAL	24	30				800

III B.Sc ADVANCED ZOOLOGY AND BIOTECHNOLOGY

Sem	Component	Subject Code	Title of the Paper	Credits	Hrs/ Wk	Total Hours	CA	SE	Total Marks
V	Core	122549	Core Paper 9 : Developmental Biology	4	5	75	25	75	100
	Core	122550	Core Paper 10 : Microbiology & Immunology	4	5	75	25	75	100
	Core	122551	Core Paper 11: Environmental Biology	4	5	75	25	75	100
	Core	122552	Core Paper 12: Evolution & Animal Behaviour	4	4	60	25	75	100
	Core Practical		Practical III	-	3	45	-	-	-
	Core Practical		Practical IV	-	3	45	-	-	-
	Elective	122553	Elective I : Medical Laboratory Technology & Biochemistry	5	5	75	25	75	100
			Total	21	30				500
VI	Core	122554	Core Paper 13: Animal Physiology And Biochemistry	5	9	135	25	75	100

	Core	122555	Core Paper 14- Practical III: Physiology And Biochemistry	5	4	60	25	75	100
	Core	122556	Core Paper 15 - Practical IV: Cell And Molecular Biology And Genetics, Biotechnonology , Microbiologyand Immunology	4	4	60	25	75	100
	Elective	122557	Elective II: Medical Laboratory Technology - II	5	6	90	25	75	100
	Elective	122558	Elective III: Public Health And Hygiene	5	5	75	25	75	100
	VE	124003	Value Education	2	2		40	60	100
TOTAL				26	30	600			
Grand Total				140					

Distribution of Marks for Continuous Assessment

Part I, Part II & Part III – Theory

Test			Best 2 out of 3	Assignment / seminar		Assignment on Glossary	Model Exam	Attendance	Total	Reduced to
1	2	3		1	2					
20	20	20	40	10	10	5	25	10	100	25

Test (Best two out of three) : 40 Marks

Assignment / Seminar 2 x 10 : 25 Marks

Model Examination 80 / 8 : 25 Marks

Attendance : 10 Marks

100 Marks (reduced to 25)

Attendance:

90% & above 10 Marks

80 % & above 9 Marks

75 % & above 8 Marks

65 % & above 7 Marks with condonation

[condonation – Theory and Practicals – separately]

50% to 65 % - To skip the examination of that year and can write the exam in the next semester/year – 5 Marks

Below 50 % - Has to repeat the semester after the completion of the course.

Semester Examination:

Question Paper Pattern: Theory

Section A (K1) : (10 out of 12) x 2 = 20 Marks

Section B (K2) : (5 out of 8) x 5 = 25Marks

Section C (K3) : (3 out of 5) x 10 = 30 Marks

Total : 75 Marks

QUESTION PAPER PATTERN -UG

Knowledge Level	Section	Word Limit	Marks	Total
K1	A-10/12x2 marks	50	20	75
K1, K2	B-5/8x5 marks	150	25	
K2, K3	C- 3/5x10	300	30	

Part V:

Semester End Examination : 60 marks

Continous Internal Assessment : 40 marks

Distribution of CIA marks for elective papers:

Seminar/presentation	Assignment/ term paper	Written/ oral test	Total
20	10	10	40

Semester End Exam : Theory paper – 60 marks – duration 2.30 hrs

Question paper pattern: 10 x 6 =60 marks(10 out of 15)

I SEMESTER

CORE PAPER – 1: INVERTEBRATA-I

Total Hrs:75

Credits: 5

Course Objectives:

1. To study functional morphology of lower invertebrate fauna.
2. To understand the basic organisation of invertebrates.
3. To study the mode of life and life cycle of lower forms.

UNIT I

Principle of taxonomy, Binomial nomenclature, Classification of Animal Kingdom.

Protozoa: General characteristics and classification upto classes with examples. Type study - Paramecium, Parasitism in Protozoans (Entamoeba, Plasmodium and Trypanosoma), Economic importance.

- 15

hrs

UNIT II

Porifera: General characteristics and classification upto classes with examples. Type study of Sycon. Canal system in sponges, Economic importance of sponges.

hrs

UNIT III

Coelenterata: General characteristics and classification upto classes with examples. Type study of Obelia. Polymorphism, Corals and coral reefs.

- 15

hrs

UNIT IV

Helminthes: General characteristics and classification upto classes with examples. Type study of Taenia solium, Liver fluke – life cycle and adaptations.

- 15

hrs

UNIT V

Aschelminthes: General characteristics and classification upto classes with examples. Type study of Ascaris. Nematode parasites in relation to human welfare - *Wuchereria bancrofti*, *Enterobius vermicularis*, *Ancylostoma duodenale*.

-15

hrs

Books for Study

1. Ekambaranatha Ayyar & T.N. Anantha krishnan 1992 Manual of Zoology Vol – I (Invertebrata) Part I & II Viswanathan Pvt. Ltd.
2. Jordon EL and Verma P.S. (1995), Invertebrate Zoology, S.Chand & Co, New Delhi

Books for Reference:

1. Kotpal, R.L, S.K.agarwal, R.P.R.Khetarpal 1989 Modern text book of Zoology, Rastogi Publication.
2. Barnes, R.D. 1982, Invertebrate Zoology IV Edn. Holt Saunders International Edn.
3. Barrington, E.J.W., 1979 Invertebrates Structure and function 2nd Edn. ELBS and Nelson.

List of Journals

3. Journal of Invertebrates
4. International Journal of Science: Nature

List of Websites

4. www.earthlife.net/inverts/an-phyla.html Brief overview of all invertebrate phyla with links to information on specific groups.
5. Invertebrate – Wikipedia <http://en.wikipedia.org/wiki/Invertebrate> Foundational information on the classification, phyla, and life history of invertebrates.

6. Invertebrates – Animal Kingdom <http://animalkingdom.net/category/invertebrates/> General website on invertebrates with links to other websites for specific groups.

Course Outcomes:

Upon completion students should be able

- CO1 appreciate the diversity of lower invertebrate fauna.
- CO2 interpret the gradual evolution of invertebrates.
- CO3 understand the basic structure, organization and economic importance.
- CO4 deduce the adaptation of animals to their environment
- CO5 Comprehend the human parasitic forms and their special adaptations

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	2
CO2	3	3	2	3	2
CO3	3	3	3	3	2
CO4	3	2	2	3	2
CO5	3	3	2	2	2
AVERAGE	3	2.8	2.2	2.8	2

I SEMESTER CORE PAPER – 2 - INVERTEBRATA -II

Total Hrs:60
Credits: 5

Course Objectives:

- 4. To study the organ systems of higher invertebrates
- 5. To compare the structure and function of higher invertebrate groups.
- 6. To understand special adaptations

UNIT – I

Annelida: General characteristics and classification upto classes with examples. Type study of Nereis. Vermiculture, Metamerism & Nephridia.

- 12

hrs

UNIT – II

Arthropoda: General characteristics and classification upto classes with examples. Type study of Penaeus, Peripatus, Limulus and its affinities.

- 12

hrs

UNIT – III

General topics: Crustacean larvae and their significance, Mouth parts of insects. Social life in insects. Beneficial insects and harmful insects, Metamorphosis in insects.

- 12

hrs

UNIT – IV

Mollusca: General characteristics and classification upto classes with examples. Type study of Pila. Torsion in Gastropoda, Economic importance of Mollusca-pearl culture, Foot modification in mollusca.

- 12

hrs

UNIT – V

Echinodermata: General characteristics and classification upto classes with examples. Type study star fish. Echinoderm larvae and their significance. Water vascular system in Echinoderms.

- 12

hrs

Books for Study

1. Ekambaranatha Ayyar & T.N. Anantha krishnan 1992 Manual of Zoology Vol – I (Invertebrata) Part I & II Viswanathan Pvt. Ltd.
2. Jordon EL and Verma P.S. (1995), Invertebrate Zoology, S.Chand & Co, New Delhi

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6. Invertebrates – Animal Kingdom <http://animalkingdom.net/category/invertebrates/> General website on invertebrates with links to other websites for specific groups

Course Outcomes:

Upon completion students should be able to

- CO1** Understand the basic structure, organization of higher invertebrates.
- CO2** able to understand connecting links and their special features.
- CO3** assess the larval adaptive features.
- CO4** comprehend the parasitic adaptations in higher invertebrates.
- CO5** correlate the divergence of characters from common ancestors.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 32	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	3	3	2	2	3
CO3	3	3	3	3	2
CO4	3	3	1	3	3
CO5	3	3	2	2	2
AVERAGE	3	3	2.2	2.4	2.6

II SEMESTER CORE PAPER – 3 CHORDATA

Total Hrs : 90
Credits : 4

Objective: Functional morphology of the types included , with special emphasis on the adaptations to their mode of life.

UNIT: I PROCHORDATES & PISCES

General characters & outline classification of phylum chordate up to order with eg. Origin of Chordates.

Prochordata : Amphioxus, Ascidian , Balanoglossis - Organisation & Affinities.

Agnatha : Structure and Affinities of Petromyzon.

Pisces : Scoliodon Organisation

Migration and Parental Care in fishes, Accessory respiratory organs in fishes.

- 30 hrs

Unit – II AMPHIBIA

Characteristics and Classification of Amphibia up to order level.

Frog: Organization, metamorphosis and terrestrialisation.

Parental care in Amphibia, Gymnophiona: neotony .

-15

hrs

UNIT – III REPTILIA

Characteristics and Classification of Reptilia up to order level.

Calotes: Organization

Identification of Poisonous snakes, south Indian snakes. Poison apparatus and Biting mechanism , Extinct reptiles, Rhycocephalia

- 15 hrs

Unit – IV AVES

Characteristics and Classification of Birds up to order level

Columba livia: Organization

Flight adaptations in birds, Migration of birds, Birds are glorified reptiles

- 15 hrs

UNIT – V MAMMALIA

Characteristics and Classification of Mammals up to order level

Oryctolagus: Organisation

Prototheria and Metatheria-Structure and Affinities, Dentition in Mammals, stomach in mammals.

Adaptive radiation in mammals, Aquatic mammals

15hrs

Books for Study

1. Ekambaranatha Ayyar and T.N. Ananthakrishnan, 1995. "A Manual of Zoology". Vol 2 (Part 1 & 2), S. Viswanathan, Chennai
2. Jordan E.L and P.S. Verma, 2000 "Chordate Zoology" S. Chand, New Delhi.

Books for Reference

1. De Beer G, 1966, "Vertebrate Zoology", Sedgwick & Jackson, London.
2. Young J.Z, 1950, "The Life of Vertebrates", Oxford University Press, London.
3. Newman. H.H, 1939, "The Phylum Chordata", Mc Millan, New York.

List of Journals

4. [PLOS One](#)
5. International Journal of Science: Nature
6. Journal of Mammalogy

List of Websites

2. <https://www.acsedu.co.uk › Courses › Environmental › VERTEBRATE-Z>
2. <https://www.sciencedaily.com › terms › vertebrate>
3. https://en.wikipedia.org › wiki › List_of_biology_websites

Course Outcomes:

Upon completion students should be able to

- CO1** understand the diversity of higher fauna.
- CO2** interpret the gradual evolution of chordates from invertebrates.
- CO3** comprehend the basic structure and organization
- CO4** apprehend the adaptive radiation in animals
- CO5** analyse the consequence of terrestrialization

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	2
CO2	3	3	2	2	2
CO3	3	3	2	2	2
CO4	3	3	2	2	3
CO5	3	2	2	2	2
AVERAGE	3	2.8	2	2	2.2

CORE PAPER 4

PRACTICAL I: INVERTEBRATA AND CHORDATA

Semester: I & II

Total Hours: 90
credits:4

Course Objectives:

4. To dissect the organ systems of invertebrates and chordates.
5. To compare the structure and function of invertebrate and chordate groups
6. To understand special adaptations in animals

DISSECTIONS

Cockroach: Digestive System

Nervous system

Reproductive system

Prawn: Nervous system

Appendages

Any Vertebrate: (any fish) Digestive System

MOUNTINGS

Cockroach : Mouth Parts

Mosquito : Mouth Parts

House fly : Mouth parts

Fish : Placoid scales , cycloid scales, ctenoid scales.

SPOTTERS

1. **Classify giving reasons:**

Paramecium, Obelia colony, Taenia, leech, Penaeus, Pila, Asterius, Amphioxus, Scoliodon, Testudo, Columba livia, Rabbit.

2. **Draw labeled sketches:**

Medusa of Obelia, T.S of *Fasciola*, *Taenia*, *Ascaris*, T.S. of *Nereis*, T.S through pharynx of *Amphioxus*, *Rana*: Skull, Girdles (pectoral & pelvic)

3. **Biological significance:**

Conjugation in Paramecium, Gemmule of sponges, Physalia, Peripatus, Chaetopterus, Limulus, Petromyzon, Ammocetus, Balanoglossus, Hippocampus, Ichthyophis, Axolotl, Chamaeleon, Draco, Echeneis, Exocoetus.

4. **Relate Structure & Function:**

Spicules in sponge, scolex (*Taenia*), Parapodium (*Neries*) Petasma in prawn, radula (*Pila*), Pedicellaria in star fish, placoid scales in shark, electric organ (Narcine/Torpedo), quill feather, carapace & plastron, synsacrum.

5. **Descriptive Notes:**

Medusa of obelia, Ascidian, Balanoglossus, Redia, Cercaria, Filarial worm, Hook worm, Corals, Glochidium, Lepas, Bippinaria, Amphioxus, Anguilla, Hyla, Rhacophorus, Naja, Dentition (Oryctolagus & dog).

RECORD of the work done in the laboratory must be submitted during the practical examination.

Books for Study

3. Ekambaranatha Ayyar and T.N. Ananthakrishnan, 1995. "A Manual of Zoology". Vol 1 and 2 (Part 1 & 2), S. Viswanathan, Chennai
4. Jordan E.L and P.S. Verma, 2000 "Invertebrate Zoology" S. Chand, New Delhi
2. Jordan E.L and P.S. Verma, 2000 "Chordate Zoology" S. Chand, New Delhi.

Books for Reference

4. A Manual of Practical Zoology: Invertebrates Paperback – 1 Dec 2010 by [Verma P.S.](#) (Author)
5. Practical Zoology: Vertebrate Paperback – 3 Aug 2015 by [S. S. Lal](#) (Author)
6. Non-Chordate (Invertebrate) Zoology Practical Paperback – 2009 by [Pandey](#) (Author), [Shukla](#) (Author)

Course Outcomes:

Upon completion students should be able to

- CO1** have hands on experience of dissecting invertebrates and chordates
- CO2** appreciate the structural modifications of animals
- CO3** assess the development of adaptive features.
- CO4** compare the gradual emergence of evolutionary traits in animals by studying connecting links
- CO5** comprehend the special features in organisms with reference to their environment

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	2	3	2
CO4	3	3	3	2	2
CO5	3	3	2	3	3

AVERAGE	3	3	2.6	2.8	2.6

SEMESTER-III

CORE PAPER 5

CELL AND MOLECULAR BIOLOGY & GENETICS

Total hrs : 60

Credits : 4

Course Objectives:

4. Understand the basic structure and functions of a cell.
5. To explore the molecular architecture of biomolecules and their complex interactions
6. To understand the basic principles of heredity and the mechanism of inheritance

UNIT – I

Prokaryotic and eukaryotic cell - Animal cell structure. Plasma Membrane: Structure – lamellar, unit membrane, fluid mosaic models- functions. Endoplasmic reticulum: Morphology, structure- types and functions. Golgi complex: Structure and Functions. Lysosome: Structure, polymorphism and functions . - 15 hrs

UNIT – II

Mitochondria: Structure , Functions – Krebs cycle – ETP. Ribosomes: Structure and protein synthesis. Nucleus & Nucleolus: Structure and functions. Chromosome: Structure- Giant chromosomes, Lamp brush chromosomes. Nucleic Acids: Molecular structure of DNA & RNA - Types of RNA . Mechanism of replication of DNA. - 15 hrs

UNIT – III

Mendelism – Mendel's experiments and laws of Mendel, Mono, Di and Tri hybrid crosses. Modifications of mono hybrid phenotypic ratio. Multiple Alleles- Blood group inheritance in man & Rh factor. - 10 hrs

UNIT – IV

Linkage – Morgan's experiments, theories of linkage, factors affecting linkage. Crossing over- Types, evidence and significance of Crossing over. Mapping of Chromosomes. Sex determination in man, Sex-limited and Sex-influenced inheritance in Man. - 10 hrs

UNIT – V

Cytoplasmic inheritance. Inbreeding, Out breeding – Heterosis [Hybrid Vigour], Inborn errors of metabolism. Hardy – Weinberg's principle and factors affecting gene frequency. Mutation - types and causes - Gene mutation – chromosomal aberration. Fine structure of the gene – Cistron, recon, muton.

- 10

hrs

Books for Study

1. Verma P.S. & Agarwal V.K. (1991) Cytology. S.Chand & Co, New Delhi
2. Verma P.S. and Agarwal V.K. (2004) – Genetics, S.Chand & co. New Delhi.
3. Dalela R.C., and Verma S.R. 1970, A text book of Genetics, Jaiprakash Nath and Company, Meerut.

Books for Reference

4. De Robertis E.D.P. & De Robertis E.M.F. (1988) Cell and Molecular Biology.
5. Swanson C.P.(1990). The Cell – 8th Edn. Prentice Hall of India Pvt. Ltd. New Delhi.
6. Hans S.S. (1986) Cell Biology – Allen & Unwin.
4. Sinnot E.W, L.C.Dunn and T.Dobzhansky, Principles of Genetics (1973) 4th Edn., Tata Mc Graw Hill Pub. Co. Ltd,
- 5.Gupta P.K., 2000, Genetics, Rastogi Publications, Meerut.
- 6.Brown, T.A. 1998, Genetics – A molecular approach, Champion Hall, London.

List of Journals

8. [The Journal of Cell Biology](#)
9. [Nature Reviews Molecular Cell Biology](#)
10. [Nature Cell Biology](#)
11. [Trends in Cell Biology](#)
12. [Journal of Genetics - Springer](#)
13. Nature Genetics
14. Human Molecular Genetics

List of Websites

3. <https://www.nature.com> › nature cell biology
4. <https://www.edx.org> › learn › molecular-biology
3. <https://www.genome.gov> › about-genomics › teaching-tools › Genomics-
- 5 <https://www.genetics.org>

Course Outcomes:

Upon completion students should be able to

- CO5CO1 understand the morphology, structure, and functions of cell and cell organelles
- CO2 apprehend the molecular structure of chromosomes and nucleic acids.
- CO3 comprehend the role of hybrid crosses inheritance and blood grouping.

- CO4** realize the necessity for mapping of chromosomes, sex determination and sex-linked inheritance in man.
- CO5** interpret cytoplasmic inheritance and mutation in Man and other organisms.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	2	2
CO4	3	3	2	2	2
CO5	3	3	3	3	3
AVERAGE	3	3	2.6	2.6	2.6

SEMESTER -III
CORE PAPER - 6- BIOTECHNOLOGY

Total Hrs: 60
Credits : 4

Course Objectives

4. To study and understand the basics of biotechnology
5. To understand the industrial applications of biotechnology.
6. To learn the techniques in biotechnology for conservation of environment.

UNIT – I INTRODUCTION

Origin and Definition – Scope ,history and Importance of Biotechnology – Tools in Biotechnology – recombinant DNA technology – Restriction Enzymes – Gene cloning – Cloning Vectors – Plasmids, Phages, Cosmids –Polymerase chain Reaction – CDNA Library – Electroporation and Microinjection.

-10 hrs

UNIT - II ANIMAL BIOTECHNOLOGY

Animal tissue culture – In vitro fertilization – embryo transfer in man and Cattle – Transgenic animals – Medical Biotechnology: Production of health care products – Hybridoma – Monoclonal anti bodies – hormone production .

-10 hrs

UNIT – III PLANT BIOTECHNOLOGY

Role of Nif and Nod genes – Transgenic plants – Plant vectors – Biosafety – Ecological, Social, Legal Issues regarding Handling of transgenic Plants.

-10 hrs

UNIT – IV INDUSTRIAL BIOTECHNOLOGY

Bioreactors – Fermentation process – Fermentation Industry – Microbial Enzymes and their application – Products of Microbial Fermentation – Biogas Production – Biofertilizers – Bioinsecticides. Application of genetically engineered bacteria.

-15 hrs

UNIT – V ENVIRONMENTAL BIOTECHNOLOGY

Renewable Energy – Energy and Fuel production – Biomass source of energy – Solid waste management – Vermi composting process and application – Bioremediation – Hydrocarbons, Industrial wastes and Xenobiotics.

- 15

hrs

Books for Study

3. F.C. Dubey - Biotechnology, 2005, U. Satyanarayanan - Ref. Biotechnology, 2005.
4. Biotechnology by V. Kumaresan

Books for Reference

5. **Biotechnology (2012)**
by [S. S. Purohit](#) (Author), [Shivangi Mathur](#) (Author)
6. Biotechnology by U. Sathyanarayana
7. Introduction to Plant Biotechnology H.S. Chawla
8. Applications of Environmental Biotechnology – Springer Link

List of Journals

6. Nature Biotechnology
7. Journal of Biotechnology
8. Biotechnology and Bioengineering
9. Applied Microbiology and Biotechnology
10. Critical Reviews in Biotechnology

List of Websites

6. <http://www.bio.com/resedu/educat..>
7. <http://www.biotechnology.gov.au/>
8. www.brsi.in
9. <http://www.bio.com/resedu/educate2.html>.
10. <http://www.biotech.wisc.edu>.

Course Outcomes:

Upon completion students should be able

- CO1** understand the principles of biotechnology.
- CO2** evaluate the role of biotechnology in agriculture.
- CO3** assess the extensive application of biotechnology in human health.
- CO4** develop tools and techniques to increase the production and conserve environment.
- CO5** create and find employment in biotechnology industries.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	2	3	3	3
AVERAGE	3	2.8	2.8	3	3

SEMESTER - IV
CORE PAPER 7- BIOPHYSICS & BIOSTATISTICS

Total hrs : 90
Credits : 4

Course Objective:

4. To learn the basic principles of biophysics
5. To understand the applications of biostatistics.
- 6.

UNIT I

Biophysics : Scope of Biophysics: Colloids – Description, types and properties, Electrokinetic properties, Tyndall effect, surface tension, Brownian movement, filtration, osmosis, dialysis and Adsorption. Laws of thermodynamics.

- 15 hrs

UNIT II

Bioenergetics, ATP - Energy and its forms - free energy- Enthalpy and Entropy - Redox potential, redox coupling and ATP bioenergetics. Structure of atom, macromolecules and intermolecular forces. Types of bonds - Hydrogen bond, disulphide bond, covalent bonds and Electrostatic bond.

- 15

hrs

UNIT III

Biostatistics: Data Collection – Sources of Primary and secondary data – Classification and Tabulation, Organization of data: Individual, discrete frequency series – Types of variables – Derived variables.

- 20 hrs

UNIT IV

Diagrammatic Representation of Data – Bar diagram, Pie diagram, Histogram, Frequency polygon, Frequency Curve, Ogive, Pictograph, Scatter diagram.

- 20 hrs

UNIT V

Measurement of Central tendency – Mean, Median and Mode, Standard deviation, correlation and regression.

-20 hrs

Books for Study

1. Das, D. 1996, Biophysical and Biological Chemistry, Academic Publishers, Kolkata.
2. Subramanian, M.A. 2005, Biophysics, Principles and Techniques, M.J.P. Publishers, Chennai
3. Upadhyay, Upadhyay and Nath, K. 1993. Biophysical Chemistry. Himalaya Publishing House.
4. Gurumani, N. 2004, Introduction to Biostatistics, M.J.P. Publishers, Delhi

Books for Reference

1. Daniel, M. 1992, Biophysics Biologist, Wiley International, New Delhi.
2. Das, D, and Das, A. 2004, Statistics in Biology and Psychology Academic Publishers, Kolkata.
3. Ramakrishnan, P. 1996, Biostatistics, Saras Publications, Nagercoil.
4. Sokal, R.J. and Rohlf, S.J. 1981, Introduction to Biostatistics, W.H. Freeman, London.

List of Journals

9. Journal of Biometrics & Biostatistics
10. Journal of Biostatistics
11. The International Journal of Biostatistics
12. Biostatistics
13. Biometrika
14. Epidemiology, Biostatistics and Public Health
15. Biophysical Journal
16. Cell Biochemistry and Biophysics

List of Websites

3. <https://www.niser.ac.in> › sbs › course › biophysics-and-biostatistics
2. <https://en.wikipedia.org> › wiki › Biostatistics
3. <https://www.biophysics.org> › ... › Additional Education Resource
4. <https://www.nature.com> › subjects

Course Outcomes:

Upon completion students should be able to

- CO1** apply principles of biophysics in understanding various phenomenon in biology.
- CO2** design and establish techniques for biological experiments.
- CO3** understand the forms of energy and bonds.
- CO4** apply statistics in analysing bio variables.
- CO5** validate biological data.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	3
CO2	2	2	3	3	3
CO3	2	1	1	2	3
CO4	3	3	2	3	3
CO5	3	3	3	3	3
AVERAGE	2.6	2.4	2.4	2.6	3

**CORE 8 - PRACTICAL II
SEMESTER III & IV**

**CELL & MOLECULAR BIOLOGY , GENETICS, BIOTECHNOLOGY ,
BIostatISTICS AND BIOPHYSICS**

**TotalHours: 90
credits :4**

Course Objectives:

4. To study the principles of biophysics molecular biology, genetics in biology.
5. To apply the principles of statistics in biological data analysis.
6. To apply the principles of statistics in biological data analysis.

CELL AND MOLECULAR BIOLOGY

1. Microscopy – Dissection and Compound Microscope
2. Cell Measurements – Ocular and stage micrometers.
3. Preparation of Cells - Squamous epithelium and Barr body
4. Camera lucida
5. Mitosis – onion root tips
6. Meiosis – Grasshopper testis
7. Total count of RBC
8. Total count of WBC
9. Differential Count of WBC.
10. Spotters - Study of prepared slides of Histology
 - f. Bone T.S
 - g. Cardiac muscle
 - h. Striated muscle
 - i. Non striated muscle
 - j. Columnar Epithelium.

GENETICS

1. Identification of Drosophila mutants – white eye, ebony body, vestigial wing, bar eye .
2. Identification of Drosophila - normal male and female.
3. Mounting of polytene chromosomes – Dipteran flies.
4. Study on Normal karyotype - male and female, Down syndrome, Turner and Klinefelter's

BIOTECHNOLOGY

5. Qualitative Isolation of DNA(Demonstration)
6. Electrophoretic separation of DNA (Demonstration)
7. PCR (Demonstration)
8. Preparation of culture medium (Demonstration)

BIO STATISTICS

1.Frequency distribution of the given samples to find out Mean, and Standard Deviation for a biological data.

BIOPHYSICS

1. Demonstration of phenomenon of Osmosis.
2. Preparation of Normal , molar ,percent and parts solutions.

Books for Reference

1. **Principles and Practice of Biostatistics - E-book Kindle Edition**
by [B Antonisamy](#), [Prasanna S. Premkumar](#), and [Solomon Christopher](#).
4. Introduction to Experimental Biophysics: Biological Methods for Physical Scientists:
Volume 2 (Foundations of Biochemistry and Biophysics) by [Jay L. Nadeau](#)

Course Outcomes:

Upon completion students should be able to

- CO1** apply biophysical principles in understanding properties of life.
- CO2** understand the principles of analytical instruments.
- CO3** learn qualitative estimation techniques in biology
- CO4** to identify various mutations in insects and Man.
- CO5** relate statistical methods to validate biological data.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	3
CO2	3	2	3	3	3
CO3	3	3	3	3	3
CO4	3	3	2	3	3
CO5	3	3	3	3	3
AVERAGE	3	2.8	2.6	2.8	3

SEMESTER V

CORE PAPER 9: DEVELOPMENTAL BIOLOGY

Total Hrs : 75

Credits :4

Course Objectives

1. Understand the scope of developmental biology
2. understand the basic concepts in embryology
3. analyse and learn the mechanism of organogenesis.

UNIT I

Theories: Preformation, Epigenetic, Recapitulation and Germplasm – Gametogenesis: Spermatogenesis - Types of Sperm- Morphology of sperm. Oogenesis, Types of eggs and egg membranes .

- 15 hrs

UNIT II

Mechanism and Physiology of Fertilization – Acrosomal reaction, cortical reaction , physiological and biochemical changes, significance – Cleavage patterns, planes and laws of cleavage-Fate maps in Frog and Chick – Embryogenesis of Frog and Chick.

- 15 hrs

UNIT III

Organogenesis: Development of Eye, brain, Heart , Ear in frog –Extra embryonic membranes in chick. Placentation in mammals.

- 15 hrs

UNIT IV

Parthenogenesis: Natural and Artificial- Regeneration: Mechanism and types , Gradient theory, Organisers and mechanism of Induction – Experimental embryology: Nuclear transplantation.

- 15 hrs

UNIT V

Human reproduction – Puberty, Menstrual cycle and Menopause – Infertility – IVF – Test tube babies – Stem cell research and its significance.

- 15 hrs

Books for Study

3. Verma, P.S. and Agarwal, V.K., 2000, Chordate Embryology, S.Chand & Co., New Delhi
4. Arumugam.N 2004. A Text book of Chordate Embryology, Saras Publication

Books for Reference

5. Balinsky, B.I., 1981, An Introduction to Embryology, Holt Saunders, New York.
6. Berrill, N.J., 1986, Developmental Biology, Tata McGraw Hill Publication Co Ltd. New Delhi.
7. Patten, B.M., 1958, Foundations of Embryology, McGraw Hill, New York.
8. Saunders, J.W., 1982 Developmental Biology – Patterns and Principles, Macmillan, New York.

List of Journals

4. Developmental Biology
5. The International Journal of Developmental Biology
6. Genes & Development

List of Websites

4. <https://www.nature.com › subjects>
5. 11e.devbio.com
6. https://www.embl.de › research › units › dev_biology
4. <https://www.journals.elsevier.com › developmental-biology>

Course Outcomes:

Upon completion students should be able to

- CO1** understand the process of reproduction and egg types
- CO2** grasp the mechanism of fertilization in animals.
- CO3** comprehend the development of organs in animals.
- CO4** apply and experiment on various processes like parthenogenesis, regeneration and nuclear transplantations.

CO5 learn the basics of human reproductive cycles, infertility and its significance

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	2
CO2	2	2	1	2	2
CO3	3	3	2	3	3
CO4	3	1	2	2	2
CO5	3	1	2	2	3
AVERAGE	2.8	2	1.8	2.2	2.4

SEMESTER V
CORE PAPER 10 -MICROBIOLOGY AND IMMUNOLOGY

Total hrs: 75
Credits : 4

Course Objective

3. Understand the basic concepts of microbiology.
4. Study the basic principles of immunology

UNIT I

History and Scope of Microbiology; Classification of Microorganisms; Salient features of Bacteria, Virus, Actinomycetes, Fungi; Structure and Reproduction of Viruses. (T4 phage and HIV) Prions – Bacterial growth and nutritional requirements; Culture of microorganisms – Types of Culture media, Preparation and maintenance of culture media. Reproduction in Bacteria – Conjugation, Transformation, Transduction.

- 15 hrs

UNIT II

Diary Microbiology: Pasteurization – Milk products – Curd, butter and Cheese. Food Microbiology: Fermented food, Food spoilage, Food Poisoning, Physio-Chemical methods in food preservation. Water Microbiology: Coliform bacteria and technique.

- 10 hrs

UNIT III

Study of Common bacterial and viral diseases of man – Causative organisms, mode of transmission, pathogenicity, symptoms & their preventive measures. Diseases of Gastro – Enteric System – Cholera, Typhoid & Viral Hepatitis, Respiratory System – Diphtheria,

Pneumonia, Tuberculosis. Nervous System – Leprosy, Tetanus, Polio and Rabies. Genital System – Gonorrhoea and Syphilis, Viral Cancer and AIDS. -

15hrs

UNIT IV

Immune System – Types of Immunity – Innate and acquired Immunity: Passive and active; Lymphoid organs – Primary and Secondary Organs, GALT & BALM. Lymphocytes – Sub-Population of T&B Cells; Antigens – Types, structure and functions; Vaccines – Preparations and Immunization; Immunization schedule. Recognition of Antigen, processing of Antigen. Antigen presentation. Immunoglobulin - Types structure and function. Immune response – Cell mediated Immune response. - 25

hrs

UNIT V

Humoral Immunity and Cell Mediated Immunity – Complements – Components – Mode of Activation – Classical and Alternate Pathway – MHC and HLA – Structure and Functions, Hypersensitivity – Types of hypersensitivity Immune Techniques – Principles of Precipitation – VDRL slide test, Double Immuno diffusion and Immunoelectrophoresis – ELISA, Radio Immuno Assay.

- 15 hrs

Books for Study

1. Ananthanarayanan, R. & C.K.Jayaram Panicker, 1990. Text Book of Microbiology, Orient Longman.
2. Chakravarty A.K. (1996) Immunology, Tata Mc Graw, New Delhi.

Books for Reference

- 1.Sharma, P.D., 1998, Microbiology, Rastogi Publications.
- 2.Mani, A., Narayanan, L.M.Selvaraj, A.M., & N.Arumugam (1996)
- 3.Pelczar, M.J. (2000) Microbiology, Mcgraw Hill Book Company, New Delhi.
- 4.Meena Kumari, S. 2005, Microbial Physiology, M.J.P.Publishers, Chennai.
- 5.Roitt, I. 1987, Essential Immunology, P.G. Publishing Pvt. Ltd. New Delhi.
- 6.Kuby, T.(1994) Immunology, P.G.Publishing Pvt. Ltd. New Delhi.

List of Journals

7. Microbiology
8. Applied and Environmental Microbiology
9. Microbiological Research
10. Journal of Immunology
11. Immunobiology
12. Nature Immunology

List of Websites

4. <https://microbiologyonline.org>
5. www.bioedonline.org › lessons-and-more › resource-collections › microm.
6. <https://www.scienceprofonline.com> › instructors-corner-vmc
4. <https://www.jimmunol.org>
5. <https://www.nature.com> › nature immunology

Course Outcomes:

Upon completion students should be able to

- CO1** comprehend the structural organization of microbes and their culture.
- CO2** role of beneficial and pathogenic microorganisms in food industry.
- CO3** identify the pathogens causing diseases in Man
- CO4** understand the role of immune system in human health.
- CO5** apply various techniques for diagnosis of human diseases

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	2	3	3	3
CO5	2	2	3	3	3
AVERAGE	2.8	2.4	2.6	3	3

V SEMESTER
CORE PAPER 11- ENVIRONMENTAL BIOLOGY

Total hrs: 75
Credits :4

Course Objectives:

4. To understand the basic concepts of environment
5. To study the various habits and habitats
6. To study the conservation strategies.

UNIT I

Introduction: Scope-concept-Branches of Ecology: Autecology, synecology-Abiotic factors- Water, Soil, Temperature , Air and light- Biotic factors – intra specific and inter specific animal relationships – symbiosis, Commensalism, Mutualism, Antagonism and competition. Ecosystem – Pond ecosystem – Food Chain – Food Web – Trophic Levels – Energy flow – Ecological Pyramids – Pyramid of Biomass, Number and energy.

-15

hrs

UNIT II

Population ecology - Definition – characteristics – Density, Natality, Mortality, Population fluctuation, dispersal, Age pyramid, growth forms - Population equilibrium - Regulation. Community ecology – Types of Communities - characteristics of community. Stratification –

Ecotone – edge effect – Ecological niche – Ecological succession.

- 15 hrs

UNIT III

Habitat ecology: Fresh water habitat – lentic and lotic – terrestrial habitat: Types of forests in India – Estuarine ecology – types, fauna and adaptation – Mangrove ecosystem – ecological conditions – mangroves of India – Desert: fauna and adaptations.

- 15 hrs

UNIT IV

Applied ecology: Pollution – pollutants and types – Air, water and noise-Green house effect – Ozone layer and its significance, Global warming, Acid rain-Hiroshima and Nagasaki – Bhopal tragedy – oil pollution.

- 15

hrs

UNIT – V

Wild life Management : Preservation- laws enforced – sanctuaries, National parks. Natural resources management , Renewable – forest, fishes, crops. Non renewable – Fossil fuels , metals and other minerals. Women's role in Ecology.

- 15

hrs

Books for Study

2. Verma P.S. and Agarwal V.K. 2000, Environmental Biology, S.Chand & Co, New Delhi.

Books for Reference

3. Odum, E.P. (1983) Basic Ecology, Saunder's College Publishing New york.
4. Clarke, G.L.(1954) Elements of Ecology, John wiley & Son Inc. New York London 534 pp.
3. Kotpal, R.L. and N.P.Bali 1986 Concepts of Ecology, Vishal Publications Delhi.
4. Ananthakrishnan, T.N. and S.Viswanathan, Principles of Animal Ecology
5. Bandopadhyay, J. India's Environment crisis and response, Nataraj Publishers, Dehra Dun.

List of Journals

4. Journal of Environmental Biology
5. Open Journal of Environmental Biology
6. Journal of Environmental Biology - SCImago

List of Websites

3. www.jeb.co.in

4. https://www.researchgate.net › journal › 0254-8704_Journal_of_Environ..
3. <https://www.scimagojr.com › journalsearch>

Course Outcomes:

Upon completion students should be able to

CO1: .
CO2:
CO3:
CO4:
CO5:

- CO1** comprehend the various trophic levels in food chain and patterns of energy flow
- CO2** understand population equilibrium and the factors related
- CO3** analyse different ecosystems and associated adaptations.
- CO4** identify types and levels of pollution affecting the living systems.
- CO5** Conserve environment by wildlife management and renewable resources

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	2
CO2	3	3	2	2	2
CO3	3	3	2	3	2
CO4	2	3	2	2	2
CO5	3	3	1	3	3
AVERAGE	2.8	3	2	2.6	2.2

SEMESTER V CORE PAPER 12- EVOLUTION AND ANIMAL BEHAVIOUR

Total hrs: 60

Credits : 4

Objective:

4. To understand the basic concept of evolution
5. To study the theories related to origin of life
6. To learn the behavioural patterns in animals.

UNIT I

Origin of life, Lamarck and his principles , Darwin and his principles . Evidence for evolution from Morphological, physiological, biochemical, embryological . Industrial Melanism. Modern theory of evolution.

-12 hrs

UNIT II

Geological time scale. Genetic drift and evolutionary significance. Living fossils . Speciation – species concept – sub species and sibling species, allopatric and sympatric speciation. Isolating mechanism – Types.

-12

hrs

UNIT III

Evolution of man – Ancestry of man (Dryopithecus, Australopithecus, *Homo habilis*, *H. erectus*, *H. neanderthalensis*, the Cromagnon man, Modern man - Socio cultural evolution. Barriers – continental drift. Extinction – types and causes.

-12

hrs

ANIMAL BEHAVIOUR

UNIT IV

Animal behaviour - Introduction – Definition – stereotype and aquired behaviour, role of cerebral cortex in behaviour. Types of behaviour- Instinctive behaviour. Intelligence - learning, imprinting, reasoning. communication – touch and visual communication. Human gestures.

- 12

hrs

UNIT V

Motivation - Effects of motivation on behavior – Biological , hunger, aggressive feeding behaviour . Social behaviour - Insects and Birds . Periodicity and biological clock. Role of pheromones in behaviour, Mimicry and colouration

- 12

hrs

Books for Study

7. Verma, P.S. and Agarwal, V.K., 2002, Concept of Evolution, S.Chand and Company Limited, New Delhi.
8. Arumugam, N., 2002, Organic Evolution, Saras Publication, Nagercoil.

Books for Reference

8. Minkoff E.C. 1983, Evolutionary biology, Addison Wesley Publishers
9. Dobzhansky, T., Ayala, F.J., Stebbins, G.L. and Valentine, J.W., 1977, Evolution, W.H.Freeman and Co., San Francisco.
10. Dobzhansky, Th. Genetics and Origin of Species 1951, Columbia Uty. Press.
11. Stansfield, W.D., 1977, The Science of Evolution, Collier Macmillan, London.
12. Colbert. E.H. 1970, Evolution of the Vertebrates, Wiley Eastern Edn
13. Davis,D.E.1970. Integral Animal Behaviour, Macmillan, New York.
14. Desmond Morris, 1990. Animal Watching (Field guide), Crown Pub Co. London

List of Journals

1. Evolution
2. Journal of Evolutionary Biology
3. Molecular Biology and Evolution
4. Animal Behaviour Journal
5. Journal of Animal Behaviour and Biometerology

List of Websites

1. <https://onlinelibrary.wiley.com> › journal
2. <https://onlinelibrary.wiley.com> › journal
3. <https://www.hindawi.com> › journals › ijeb
4. <https://www.journals.elsevier.com> › animal-behaviour
5. <https://www.sciencedirect.com> › journal › the-british-journal-of-animal-beha...

Course Outcomes:

Upon completion students should be able to

- CO1** appreciate the theories on the origin of life.
- CO2** comprehend geological time scale and the mechanism of speciation.
- CO3** realize the evolution of Man and the concept of extinction.
- CO4** recognize the various types of behaviour in animals.
- CO5** grasp the role of nervous system and hormones in behavioural patterns

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	2
CO2	3	3	2	2	2
CO3	3	3	1	2	2
CO4	3	3	3	2	2
CO5	3	1	2	2	1
AVERAGE	3	2.6	2	2	1.8

SEMESTER V
ELECTIVE - I
MEDICAL LABORATORY TECHNOLOGY & BIOCHEMISTRY

Total hrs : 75

Credits:5

Course Objectives

- 1.To study the scope of Medical lab technology.
2. To understand the application of MLT in human health.
3. To know the various nutrients and to understand their metabolic pathway

UNIT I

Scope of Medical Laboratory techniques . General Lab apparatus and glasswares used in laboratories. Cleaning and sterilization of laboratory instruments. Blood collection procedures. Bleeding time and clotting time. Total count of RBC , Total count and differential count of WBC. Estimation of Haemoglobin and ESR. -

15hrs

UNIT II

Analysis of urine samples – Microscopic examination for deposits, RBC, casts and pus cells. Qualitative estimation of sugar, albumin, bile pigment and bile salts in urine sample. Pregnancy test. Clinical diagnosis of viral diseases such as measles, Hepatitis ; Bacterial diseases such as Tuberculosis, tetanus, diphtheria, cholera and typhoid; Protozoans diseases such as Amoebic dysentery, malaria, Helminthes diseases such as Ascaris, Filariasis. -

15 hrs

BIOCHEMISTRY:

UNIT III

Classification, structure and functions of Amino acids , proteins ,carbohydrates and lipids. Vitamins - Water soluble and fat soluble vitamins occurrence, functions and deficiency diseases. Water - The basic molecule of life - molecular structure -physical and chemical properties- density - specific heat. - 15

hrs

UNIT IV

Enzymes - Classification, Properties, Chemical nature and mechanism of enzyme action - Factors affecting enzyme action - Enzyme kinetics - Enzyme inhibition. -15 hrs

UNIT V

Metabolic pathways of Carbohydrates – Glycogenesis, Glycogenolysis, Glycolysis, Krebs's cycle, and gluconeogenesis, protein metabolism – Deamination, Transamination. Lipid metabolism – Oxidation of fatty acids. - 15 hrs

Books for Study

1. Medical Laboratory Technology by Ramnik Sood, Japee brothers, New Delhi.
2. Textbook of Medical Laboratory Technology Vol 1 & 2 by [Godkar P.B.](#)
3. Fundamentals of Biochemistry for Medical Students by Ambika Shanmugam
4. Fundamentals of Biochemistry by J.L.Jain

Books for Reference

1. Biochemistry by U. Satyanarayana
2. Baker F.J. and Silvertown R.E. Introduction to Medical Laboratory Technology.
3. K.L. Mukherjee Medical Laboratory Technology Vol. I, II & III.
4. Prof. C.R. Maiti Medical Laboratory Technology – New Central Book Agency Pvt Ltd. Kolkata.

List of Journals

1. [International Journal of Medical Laboratory Research](#)
2. Medical Laboratory Technology Journal
9. Journal of Medical Laboratory and Diagnosis
10. Journal of Biological Chemistry
11. The International Journal of Biochemistry
12. Biochemical Journal

List of Websites

1. <https://www.ijmlr.com>
2. <https://doaj.org> › toc
3. <https://academicjournals.org> › journal › JMLD
4. <https://academic.oup.com>

5. <https://www.elsevier.com> › life-sciences › journals

6. <https://www.omicsonline.org> › biochemistry-journals-india

Course Outcomes:

Upon completion students should be able to

- CO1** understand the various techniques in blood sample analysis.
- CO2** analyse body fluids for diagnosis of various human diseases
- CO3** comprehend the structure and functions of macromolecules, vitamins and their deficiency diseases.
- CO4** realize the properties, nature and mechanism of enzyme functions.
- CO5** appreciate the metabolic pathways and metabolism of macromolecules.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	3	3
CO2	3	3	3	3	3
CO3	3	2	2	1	1
CO4	2	2	2	2	1
CO5	3	3	3	1	3
AVERAGE	2.8	2.4	2.6	2	2.2

SEMESTER VI
CORE PAPER 13- ANIMAL PHYSIOLOGY

Total hrs : 135 hrs
Credits:5

Course Objectives:

1. To study the basics of metabolism and other physiological activities.
2. To understand various rhythms and regulations associated.
3. To know the mechanism of actions of structural units of all organs

UNIT I

Introduction – Scope and fields of Physiology, Digestion – Intracellular and extracellular. Digestive enzymes and physiology of digestion, Absorption. - 15 hrs

UNIT II

Respiration – Respiratory pigments – properties and functions Transport of oxygen and carbon dioxide by blood, Anaerobiosis. **Circulation** – Composition, properties and functions of blood, Blood coagulation – Intrinsic and extrinsic pathways, Types of hearts, Human cardiac cycle, pacemaker and cardiac rhythm, regulation of heart beat, ECG and blood pressure. - 20 hrs

UNIT III

Excretion – Kinds of excretory products, Ornithine cycle, Structure of a mammalian kidney and nephron, Mechanism and hormonal regulation of urine formation.
Muscles – Types of muscles and muscle proteins, physical and chemical properties of contraction. Isometric and isotonic contractions, Theories of contraction, Muscle twitch, Tetanus, Clonus, Fatigue. - 20 hrs

UNIT IV

Nervous system – Structure and types of nephrons, Origin and conduction of nerve impulse, Synaptic transmission, Neurotransmitters, Autonomous nervous system.

Receptors – Mammalian eye and physiology of vision. Mammalian ear and physiology of hearing. - 20 hrs

UNIT V

Endocrine glands – Structure, secretions and hormonal functions of Pituitary, Thyroid, Parathyroid, Adrenal, Pancreas and sex organs. Gastrointestinal Hormones. - 15 hrs

Books for Study

4. Parameswaran, Ananthakrishnan and Ananthasubramanian, 1975, Outlines of Animal Physiology, S. Viswanathan, Printers and publishers, Pvt. Ltd., 329 pp.
5. Verma P.S., B.S. Tyagi, & V.K. Agarwal, 1980, Animal Physiology, S.Chand & Comp. Ltd., New Delhi.
6. Goel, K.A. & K.V.Sastry, 1984. A Text Book of Animal Physiology, Rastogi Publ. Meerut

Books for Reference

6. William Hoar, 1976, General and Comparative Physiology, Prentice Hall of India Pvt. Ltd., New Delhi.
7. James A. Wilson 1972. Principles of Animal Physiology, Macmillan, New York.
8. Ladd Prosser, C. & Frank A. Brown JR, 1973, Comparative Animal Physiology, W.B. Saunders, Toppan.
9. Donnell Turner, C., 1966, General Endocrinology, Saunders, Toppan.
10. Ghosh. H.N. 1984, Human Physiology, The new Book Stall, Kolkata.

List of Journals

1. [Journal of Animal Physiology and Animal Nutrition](#)
2. Animal Physiology
3. Animal physiology - Latest research and news | Nature
4. Journal of Animal Physiology and Animal Nutrition - SCImago

List of Websites

1. <https://onlinelibrary.wiley.com> › journal
2. <https://www.omicsonline.org> › animal-physiology-journals-articles-ppts-list
3. <https://www.nature.com> › subjects
4. <https://www.scimagojr.com> › journalsearch

Course Outcomes:

Upon completion students should be able to

- CO1** understand the mechanism of digestion and absorption
- CO2** appreciate the role of respiratory pigments in transport of oxygen
- CO3** comprehend the properties and functions of blood and heart.
- CO4** apprehend the cycles involved in excretion and properties, functions of muscle.
- CO5** realize the coordination of nervous tissues and sense organs. Also to understand the role of hormones

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	2
CO2	3	3	2	3	2
CO3	3	3	2	3	2
CO4	3	3	2	3	2
CO5	2	3	2	3	2
AVERAGE	2.8	3	2.2	3	2

SEMESTER - VI
ELECTIVE II
ECONOMIC ZOOLOGY

Total hrs :90
Credits : 5

Course Objectives

1. To understand the concepts of pest management.
2. To explore the cultivable breeds of animals for sustainable growth.
3. To develop entrepreneurial skills through aquaculture and animal farming.

UNIT I

Pest - Definition and causes for insects attaining pest status. Insect pests - Damage and loss due to pests - any two pests of the cash crops, cereals /pulses stored grains , vegetables / fruits - pest control strategies , I.P.M. - 15 hrs

UNIT II

Beneficial insects- Honey Bee , Common species, by products of apiary, economic importance . Silk worm, common cultivable species, types of silk, economic importance of silk and its by products - Lac insect, economic importance of lac. - 20 hrs

UNIT III

Aquaculture - definition , cultivable species, types of aquaculture - pisciculture (fresh water , marine , brackish). - crustacean, osyter and other molluscans, mariculture , seaweeds - by products - preservation and processing of aquaculture products - marketing potential of aquaculture products. - 20 hrs

UNIT IV

Fowl - economically important breeds for egg and meat - farming , diseases and prevention - by products - economic importance of piggery - economically important breeds- economic importance - 20 hrs

UNIT V

Diary – economically important breeds for milk - economic status and importance. Sheep farming - economically important breeds for wool and meat - economic importance

- 15 hrs

Books for Study

2. Elements of Economic Entomology 8th Edition (Elements of Economic Entomology)
by David B. Vasantharaj

Books for reference

4. Encyclopaedia Of Economic Zoology (Set Of 2 Vols.)
by A. A. Khan
5. Elementary Textbook of Economic Zoology and Entomology by Rennie
6. Economic Zoology: An Introductory Text-book in Zoology, with Special ...
by Herbert Osborn

List of Journals

9. Journal of Entomology and Zoology Studies.
10. [Journal Rankings on Animal Science and Zoology - SCImago](#)
11. International Journal of Zoology and Applied Biosciences
12. Pest management and economic zoology.

List of Websites

11. <https://www.scimagojr.com> › *journalrank*
12. www.worldcat.org › *title* › *pest-management-and-economic-zoology*
3. <https://www.ijzab.com>

Course Outcome

Upon completion Students should be able to

- CO1** know the economic importance of animal farming.
- CO2** understand the techniques in animal husbandry
- CO3** gain more information on economic aspects of zoology.
- CO4** practice methods for better livelihood.
- CO5** become entrepreneurs and create jobs.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	3	3
CO2	3	3	3	3	3
CO3	3	3	2	3	3
CO4	3	3	2	3	3
CO5	3	2	2	3	3
AVERAGE	3	2.8	2.2	3	3

SEMESTER VI
ELECTIVE III
PUBLIC HEALTH AND HYGIENE

Total hrs : 75

Credits : 5

Course Objectives

4. To understand the importance of hygienic practices.
5. To create awareness about healthy living.
6. To impart knowledge about pathogenic infections and lifestyle diseases.

UNIT I

Scope of Public Health and Hygiene – Concepts of Health and Disease – History of Public Health in India. Nutrition and Health: Classification of foods – Nutritional deficiencies – Vitamin deficiencies – Balanced diet – Nutritional requirements of special groups.

- 15 hrs

UNIT II

Environment and Health: Water-sources, Pollution, purification – water quality standards. Air: Ventilation – pollution - noise pollution - radiation effects - solid waste and excreta disposal - sewage treatment.

- 10

hrs

UNIT III

Communicable diseases: Respiratory infections: Measles, Rubella, Mumps, Diphtheria. Intestinal infections: Poliomyelitis, Cholera, Typhoid, Amoebiasis. Arthropod infections: Malaria, Filariasis, Dengue. Zoonosis: Rabies, Plague, Japanese encephalitis. Surface infections: Tetanus, Leprosy, STD and AIDS.

-15 hrs

UNIT IV

Non Communicable Diseases: Coronary Heart Disease-Hypertension-Diabetes-Obesity-Blindness –Stroke. Occupational Health Hazard: Physical, Chemical, Mechanical, Biological and Psychological. Mental Health: Causes of mental ill health-alcoholism and Drug dependence.

- 20 hrs

UNIT V

Health Education :Health planning in India – Health programmes in India – WHO –Non-governmental Voluntary Health Organizations . First aid and Nursing: Methods – Dressing – Care – Duties – Preparations.

- 15

hrs

Books for study

2. Public Health and Hygiene by V. Kumaresan, R. Sorna Raj,

Books for Reference

3. Park and Park, 1995.Text Book of Preventive and Social Medicine.M/S Banarsidas Bhanot Publishers, Jabalpur.
4. Verma,S. 1998. Medical Zoology, Rastogi Publications, New Delhi.

List of Journals

4. International Journal of Hygiene and Environmental Health
5. Journal of Healthcare and Hygiene - iMedPub LTD
6. Journal of Public Health Hygiene and Safety

List of Websites

4. <https://www.journals.elsevier.com › international-journal-of-hygiene-and-e...>
5. www.annexpublishers.com › journals › journal-of-public-health-hygiene-a.
3. www.imedpub.com › journal-healthcare-hygiene
4. <https://www.jpnh.org>

Course Outcome

Upon completion Students should be able to

- CO1 understand the importance of nutrition in health.
- CO2 comprehend the impact of pollution on human health.
- CO3 distinguish between communicable and non-communicable diseases.
- CO4 recognize lifestyle diseases
- CO5 appreciate and understand the role of various human health organizations in maintenance of health.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	2	3	3	3	3
CO3	3	3	2	3	3
CO4	3	2	3	3	3
CO5	2	2	2	3	3
AVERAGE	2.6	2.6	2.6	3	3

PRACTICAL - III
SEMESTER V & VI
CORE PAPER 14 - ANIMAL PHYSIOLOGY, BIOCHEMISTRY ,
DEVELOPMENTAL BIOLOGY

Total hrs:90

credits: 5

Course Objectives:

4. To study the physiological systems of animals.
5. To analyse the responses of parameters against environmental stress.
6. To study the composition of macro and micro molecules and nutrients.

ANIMAL PHYSIOLOGY

1. Estimation of oxygen consumption of fish with reference to body weight.
2. Qualitative analysis of nitrogenous waste products in fish tank water, frog tank water, bird excreta and mammalian urine.
3. Amylase activity in human saliva in relation to pH.
4. Principles and uses of:
 1. Sphygmomanometer- Stethoscope
 2. Kymograph
 3. Respirometer.

BIOCHEMISTRY

1. Qualitative analysis of Proteins, carbohydrates and lipids in urine.
2. Determination of bleeding time.
3. Determination of Clotting time.
4. Estimation of ESR.

5. Estimation of haemoglobin by Haemoglobinometer.
6. Principles and uses of:
 4. Chromatography
 5. Spectrophotometer/ Colorimeter
 6. Centrifuge

DEVELOPMENTAL BIOLOGY

4. Observation of different stages of development in invertebrates –(Life cycle of any two Arthropods).
5. Early development of Vertebrate(Frog- egg, 2 cell stage, 4 cell stage , 8 cell stage , Cleavage, Blastula, Gastrula and yolk plug and chick-egg, 24, 48 hrs and 72 hrs).
6. Observation of egg and sperm mammals.
4. T.S of Testis and ovary of mammal.
5. Placenta of Sheep and Pig

Course Outcome

Upon completion students should be able to

- CO1** understand the functions of instruments used to analyse physiological systems.
- CO2** indicate the various blood parameters to diagnose abnormality.
- CO3** comprehend the interrelation among physiological processes.
- CO4** grasp the role of biomolecules in physiology.
- CO5** analyse and understand embryological stages and life cycle in various animal models.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	2
AVERAGE	3	3	3	3	2.8

**PRACTICAL - IV
SEMESTER V & VI
CORE PAPER 15 - ENVIRONMENTAL BIOLOGY,
MICRO BIOLOGY & IMMUNOLOGY**

**Total hrs:90
credits: 4**

Course Objectives

1. To analyse environmental data using various parameters.
2. To use techniques to identify microbes through laboratory procedures.
3. To analyse and identify the organisms of various habitats.

ENVIRONMENTAL BIOLOGY

1. Estimation of salinity in water sample
2. Estimation of O₂
3. Estimation of CO₂
4. Estimation of bicarbonates
5. Identification of Planktons - fresh water & marine planktons
6. Usage of Sacchis' Disc, Hygrometer, pH meter, rain gauge etc.
7. Adaptations of Aquatic and Terrestrial Animals based on study of museum specimens such as
 - a. Rocky shore fauna
 - b. Sandy shore fauna
 - c. Muddy shore animals
 - d. Flying animals
 - e. Burrowing animals

MICROBIOLOGY

3. Observation of permanent slides / photographs and identification of spotters Nostoc, Oscillatoria, Spirogyra, Mucor, Yeast, Aspergillus.
4. Identification of bacteria using Simple staining and differential staining methods.

IMMUNOLOGY

3. Blood grouping – Man
4. Lymphoid organs in any animal

Course Outcome

Upon completion students should be able to

CO1:

CO2:

CO3:

CO4:

CO5:

- CO1** understand the analytical methods of essential gases of biogeochemical cycles.
- CO2** describe the instruments involved and their usage.
- CO3** illustrate abiotic/biotic interactions and symbiotic relationships
- CO4** quantify and analyse the microorganisms in the environment.
- CO5** describe the role of lymphatic organs in immunity

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	2
CO4	3	3	3	3	3
CO5	3	2	3	3	3
AVERAGE	3	2.6	2.8	3	2.8

SEMESTER III
ALLIED ZOOLOGY PAPER I

Total hrs- 45
Credits - 5

Course Objectives

1. To study functional morphology of invertebrates and chordates
2. To understand the basic organisation of invertebrates and chordates
3. To understand special adaptations

Invertebrates: Study of the following types including life history
(Classification of each type study)

Unit-I

Protozoa – Paramecium- structure - reproduction.
Porifera - Sycon- structure - canal system .
Coelentrata – Obelia-- structure - reproduction.
Platyhelminthes – Taenia solium- structure - digestive system - reproduction- life cycle-
parasitic adaptations and pathogenecity.

- 10

hrs

Unit – II

Annnelida – Earthworm-morphology ,systems and reproduction.
Arthropoda – Penaeus- morphology - digestive system- excretory system-nervous system -
reproduction- life cycle.
Mollusca – Pila- morphology - digestive system - reproduction- life cycle
Echinodermata – Star fish- morphology - digestive system -water vascular system-
reproduction.

- 10

hrs

Unit – III

Chordata – study of the following types

Prochordates – amphioxus – structure and affinities.

- 5

hrs

Unit – IV

Vertebrates – type study of shark, frog, calotes – morphology, digestive, excretory,
respiratory and urinogenital system. Life cycle.

- 10

hrs

Unit –V

Pigeon and rabbit – morphology, digestive, circulatory – structure of heart, excretory and urinogenital system - respiratory, nervous – structure of brain.

- 10

hrs

Books for study

1. Ekambaranatha Ayyar & T.N. Anantha krishnan 1992 Manual of Zoology Vol – I (Invertebrata) Part I & II Viswanathan Pvt. Ltd.
2. Ekambaranatha Ayyar and T.N. Ananthakrishnan, 1995. "A Manual of Zoology". Vol 2 (Part 1 & 2), S. Viswanathan, Chennai

Books for Reference

3. Invertebrate Zoology – Jan 2009
by [P S Verma](#) , [E L Jordon](#)
4. Chordate Zoology Paperback – Jan 2013
by [P S Verma](#) and [E L Jordan](#)

List of Journals

3. Journal of Invertebrates
4. International Journal of Science: Nature

List of Websites

4. www.earthlife.net/inverts/an-phyla.html Brief overview of all invertebrate phyla with links to information on specific groups.
5. Invertebrate – Wikipedia <http://en.wikipedia.org/wiki/Invertebrate> Foundational information on the classification, phyla, and life history of invertebrates.
6. Vertebrates – Animal Kingdom <http://animalkingdom.net/category/vertebrates/> General website on vertebrates with links to other websites for specific groups.

Course Outcome

Upon completion Students should be able to

- CO1 appreciate the diversity of lower invertebrate fauna.
- CO2 deduce the adaptation of animals to their environment
- CO3 comprehend the parasitic adaptations in higher invertebrates.
- CO4 understand the diversity of higher fauna.
- CO5 interpret the gradual evolution of chordates from invertebrates.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	3
CO2	3	3	2	3	2
CO3	3	2	2	2	2
CO4	3	3	2	2	2
CO5	3	3	2	3	2
AVERAGE	3	2.8	2	2.4	2.2

SEMESTER IV

ALLIED ZOOLOGY PAPER II

Total hrs- 45
Credits - 3

Course Objectives

4. Understand the basic structure and functions of a cell.
5. To understand the basic principles of heredity and the mechanism of inheritance.
6. understand the basic concepts in embryology, environmental biology and evolution

UNIT – I

Cell biology – structure of animal cell, structure and functions of mitochondria, nucleus, Golgi bodies

UNIT –II

Genetics – Mendelism and Mendelian laws, fine structure of gene, sex determination in man, sex linked inheritance

UNIT –III

Developmental biology – Spermatogenesis and Oogenesis.

UNIT –IV

Human physiology – digestion, respiration and excretion.
Endocrine glands – pituitary, thyroid.

UNIT –V

Environmental biology – Ecosystem, biotic and abiotic factors

UNIT –VI

Evolution – Origin of life , Darwinism and lamarkism.

Book for Study

2. Cell biology, genetics, ecology, evolution and embryology – Verma.P.S and Agarwal.V.K. S.Chand and Co. New delhi

Books for Refernce

6. Cell Biology, Verma P.S. & Agarwal V.K. S.Chand & Co, New Delhi
7. Genetics, Verma P.S. & Agarwal V.K. S.Chand & Co, New Delhi
8. Ecology, Verma P.S. & Agarwal V.K. S.Chand & Co, New Delhi
9. Evolution, Verma P.S. & Agarwal V.K. S.Chand & Co, New Delhi
10. Embryology, Verma P.S. & Agarwal V.K. S.Chand & Co, New Delhi

List of Journals

1. Nature Cell Biology
2. Nature
3. Ecology and Evolution
4. Development

List of Websites

1. <https://www.journals.elsevier.com › european-journal-of-cell-biology>
2. <https://www.nature.com>
3. <https://besjournals.onlinelibrary.wiley.com › journal>
4. <https://www.scimagojr.com › journalrank>
5. <https://onlinelibrary.wiley.com › journal>

Course Outcomes

Upon completion students should be able to

- CO1** To know the morphology, structure, and functions of cell and cell organelles
- CO2** Understand the basic principles of genetics
- CO3** Understand the process of gametogenesis.
- CO4** To know the physiology and role of hormones
- CO5** Analyse ecosystems and the factors. Appreciate the theories on the origin of life.

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5

CO1	3	3	3	3	3
CO2	3	3	3	2	2
CO3	2	2	3	2	3
CO4	3	3	2	3	3
CO5	2	2	3	2	3
AVERAGE	2.6	2.6	2.8	2.4	2.8

SEMESTER IV

ALLIED ZOOLOGY PRACTICALS

DISSECTION:

1. Digestive system of Cockroach.
2. Nervous system of Cockroach
3. Digestive system of any Vertebrate (Fish)

MOUNTING:

7. Body Setae of Earthworm.
8. Mouth parts of Cockroach.
9. Mouth parts of Bed bug/honey bee
10. Mouth parts of Mosquito.
11. Shark placoid scales
12. Brain of any vertebrate

SPOTTERS:

Comment on

Entamoeba, Plasmodium, Paramecium, Sycon, Obelia colony, Obelia medusa, fasciola hepatica, Teania solium, Earthworm, Leech, Peneaus, Fresh water mussel, Pila, Starfish, Amphioxus, Shark, Rana, Naja naja, Pigeon, Rabbit.

- CO1** Have hands on experience of dissecting invertebrates and chordates
- CO2** Differentiate the structural modifications of animals
- CO3** Assess the development of adaptive features

CO4 Compare the morphological and anatomical changes in animals

CO5 To know the special features in organisms with reference to their environment

MAPPING COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	2.8	3	3	2.6	3

DEPARTMENT OF HOME SCIENCE

**Quaid-E-Millath Government College For Women
(Autonomous), Chennai-600 002**

**M.Sc., Home Science- Food Service Management & Dietetics
(Choice Based Credit System)**

Quaid-E- Millath Government College for Women (Autonomous) offers the semester system of education with credits for PG courses. Credit is related to the number of hours a teacher teaches a particular subject, as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lecture/ tutorials/ laboratory work/seminar/project work/practical training/viva voce etc., to facilitate effective teaching and learning and the credits are assigned accordingly depending on the content and the specialization.

The credit requirement for a two year PG courses shall be 91 (81 for Core and elective & 10 credits for soft skill papers & Internship)

Regulation

1. Duration

- a. There will be two semesters in each academic year. The first academic year shall comprise of the first & second semesters and the Second academic year, the third and fourth semesters.
- b. The odd semester shall consist of the period from June to November of each year & the even semester from December to April of each year.

2. Course of study

- a. The course of study for post graduate degree course shall comprise of core courses & Electives.
- b. System of credits

Year	No. of papers					Credits				
	Core	Elective	Extra-Disciplinary Elective	Soft skills	Marks	Core	Elective	Extra-Disciplinary Elective	Soft skill	Internship
I	8	2	1	2	1300	33	6	3	4	2
II	6	3	1	2	1300	27	9	3	4	-
Total	14	5	2	4	2600	60	15	6	8	2

Passing Minimum

A candidate shall be declared to have passed in each paper/practical of the Main subject of study wherever prescribed if she secures NOT LESS THAN 50% of the marks prescribed for the examination. She shall be declared to have passed the whole examination, if she passes in all papers and practical wherever prescribed, as per the scheme of examination, earning 90 credits.

Eligibility for the Award of Degree

Candidates must secure a minimum of 50% marks in the Semester End Examinations. A candidate must secure 8 credits in soft skills and 2 credits in internship in addition to 81 credits from core and elective courses to obtain a Post Graduate Degree.

Course of Study and Scheme of Examinations

Total credits - 91

C. Scheme of examination

The scheme of examinations for different semesters shall be as follows:

Distribution of marks for Internals:

Theory papers:	Internal Marks: 25
Test (Best two out of three)	40 marks
Model examination	25 marks

Attendance	10 marks
Assignment/Seminar/Presentation	25 marks
Total	100 marks (Reduced to 25)

SYLLABUS DETAILS

ALONG WITH FRAMEWORK, CREDITS OFFERED

For candidates admitted from 2017 -2018-

M.Sc Home Science-Food Service Management and Dietetics

SE M	COMPONENT	CODE	TITLE	Hrs/ week	CA	SE	TOTAL	CR

I	Core I	176601	Research Methodology and Scientific Writing	6	25	75	100	4
	Core II	176602	Life Span Nutrition	6	25	75	100	4
	Core III	176603	Advanced Food Science	6	25	75	100	4
	Core IV	176604	Quantity Food Production	6	25	75	100	4
	Elective I	176605	Food Microbiology	4	25	75	100	3
	Soft skill –I	175001			40	60	100	2
	Library			2				
			Total	30				21
II	Core V	176606	Public Health Nutrition	5	25	75	100	4
	Core VI	176607	Clinical Nutrition	5	25	75	100	4
	Core VII	176608	Housekeeping & Front Office	6	25	75	100	5
	Core VIII	176609	Quantity Food Production Practical	6	25	75	100	4
	Elective II (Major)	176610	Human Physiology	4	25	75	100	3
	Extra Disciplinary Elective I	176611	Entrepreneurship Management	4	25	75	100	3
	Soft skill –I I	175002			40	60	100	2
			Total	30				25
III	Core IX	176612	Therapeutic Dietetics	6	25	75	100	4
	Core X	176613	Bakery & Confectionery	5	25	75	100	4
	Core XI	176614	Perspectives in Home Science	5	25	75	100	3
	Elective III	176615	Nutrition & Physical Fitness	4	25	75	100	3
	Elective IV (Major)	176616	Fundamentals of Statistics and Data Analysis	4	25	75	100	3
	Extra Disciplinary Elective II	176617	Hospital Management	4	25	75	100	3
	Soft Skill - III	175003			40	60	100	2
		175005	Dietetic Internship*		25	75	100	2
			Total	30				24
IV	Core XII	176619	Therapeutic Dietetics Practical	6	25	75	100	4
	Core XIII	176620	Food Service Management	6	25	75	100	4
	Core XIV	176618	Dissertation	12			200	8

	Elective V	176621	Trends In Food Consumption	4	25	75	100	3
	Soft Skill – IV	175004			40	60	100	2
	Library			2				
			Total	30				21
			Total Working Hours	120				
			Total Credits					91

*Students will undergo Internship in Reputed Hospitals during summer vacation after Semester II.

CHOICE BASED CREDIT SYSTEM – PATTERN PER SEMESTER

For students admitted from Academic year – 2017-2018 onwards

S.No	Paper Title	Core/Elective	Hours	Credits
Semester I				
	Research Methodology and Scientific Writing	Core	6	4
	Life Span Nutrition	Core	6	4
	Advanced Food Science	Core	6	4
	Quantity Food Production	Core	6	4

	Food Microbiology	Elective	4	3
	Soft Skills-I			2
	Library		2	
	Total		30	21
Semester II	Public Health Nutrition	Core	5	4
	Clinical Nutrition	Core	5	4
	Housekeeping & Front Office	Core	6	5
	Quantity Food Production Practical	Core	6	4
	Human Physiology	Elective	4	3
	Entrepreneurship Management	Extra disciplinary Elective	4	3
	Soft Skills-II			2
	Total		30	25
Semester III	Therapeutic Nutrition and Diet	Core	6	4
	Bakery & Confectionary	Core	6	4
	Perspectives in Home Science	Core	6	3
	Nutrition & Physical Fitness	Elective	4	3
	Fundamentals of Statistics and Data Analysis	Elective	4	3
	Hospital Management	Extra disciplinary Elective	4	3
	Dietetic Internship*			2
	Soft skills-III			2
	Total		30	24
Semester IV	Therapeutic Nutrition and Diet Practical	Core	6	4

	Food Service Management	Core	6	4
	Dissertation	Core	12	8
	Trends In Food Consumption	Elective	4	3
	Soft Skills-IV			2
	Library		2	
	Total		30	21
	Total Working Hours		120	
	Total Credits			91

M.Sc. HOME SCIENCE – FOOD SERVICE MANAGEMENT AND DIETETICS
PROGRAM SPECIFIC OUTCOMES

At the end of the programme, the students will be able to:

1. Acquire in–depth knowledge and expertise needed in various avenues of food industry and health care sectors
2. Apply Skill enhancement for teaching and extension activities
3. Identify and apply best practices and principles to promote social responsibilities and environmental sustainability
4. Analyze and contribute to overall health status of the community by developing strategies to combat malnutrition
5. Design and apply research studies to formulate products and address nutritional and health related problems

SYLLABUS

RESEARCH METHODOLOGY AND SCIENTIFIC WRITING

SEMESTER: I

THEORY-6 Hrs /Week

CORE : I

COURSE OBJECTIVES:

To enable the students to

1. Understand the importance of Research.
2. Learn about tools used in data collection.
3. Familiarize on writhing the project report.
4. Obtain knowledge about various applications of statistics in the research.
5. Ensure knowledge on both qualitative and quantitative analysis in hypothetical testing.

COURSE OUTLINE:

UNIT -I

Research – Meaning, Types, objectives, Significance. Selection and Formulation of research problem. Techniques involved in defining a research problem. Research Design – Meaning, types and concepts. Principles of Experimental design.

UNIT-II

Methods of data collection.- Primary and Secondary data. Tools used for data collection – Observation, Interview Schedule, Questionnaire

Case study Method. Selection of Appropriate Method for Data Collection.

UNIT - III

Sampling Design – Census and sample Survey. Types, characteristics and Steps in sample Design. Criteria of selecting a sampling procedure. .

UNIT – IV

Thesis Writing- Contents of thesis. Review of Literature-Need for review, Review process and Bibliography-Use of Index and reference card. Writing methodology and results & discussion- General Guidelines

UNIT – V

Formatting & typing thesis-Fonts, pagination, Spacing, Alignment, Appendices & References

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Develop understanding on various kinds of research, objectives of doing research, research process, research design and sampling
CO2	Have basic knowledge on qualitative research techniques in their day to day activity
CO3	Have adequate knowledge on measurement and scaling techniques as well as quantitative analysis
CO4	Have basics awareness of data analysis and hypothesis testing procedures
CO5	Students were familiar with the ethical issues in educational research

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	2	2	2	3	3
CO5	2	2	2	3	3
Average	2.6	2.6	2.6	3	3

RECOMMENDED TEXTBOOKS:

1. Kothari C.K. (2004), 2/e, Research Methodology –Methods and Techniques (New Age International, New Delhi).
2. “ Statistical Method”, S.P. Gupta, Sultan Chand & Sons, Educational Publishers, 23 Drayage, New Delhi – 110002, 2001

REFERENCE BOOKS :

1. Guru Mani N (2010) Scientific Thesis Writing and Paper Presentation, MJP Publishers, Chennai.
2. Sharma, K.R 2002. Research Methodology. National Publishing House, Jaipur, New Delhi.
3. Thakur, D. 2003. Research Methodology in social. Deep & Deep Publications, New Delhi.

JOURNALS:

- International Journal of social Research Methodology
- Journal of modern Applied Statistical methods

E-LEARNING RESOURCES:

https://www.researchgate.net/publication/303381524_Fundamentals_of_research_methodology_and_data_collection

<https://www.nyu.edu/classes/bkg/methods/005847ch1.pdf>

https://www.researchgate.net/publication/325846997_METHODS_OF_DATA_COLLECTION

https://www.researchgate.net/publication/270956555_CHAPTER_3_-_RESEARCH_METHODODOLOGY_Data_collection_method_and_Research_tools

<https://www.open.edu/openlearncreate/mod/resource/view.php?id=52658>

http://ocw.jhsph.edu/courses/HSRE/PDFs/HSRE_lect12_skinner.pdf

https://www.researchgate.net/publication/319998246_Sampling_Methods_in_Research_Methodology_How_to_Choose_a_Sampling_Technique_for_Research

http://www.stat.osu.edu/~calder/stat528/Lectures/lecture13_2slides.PDF

https://www.student.uwa.edu.au/_data/assets/pdf_file/0007/1919239/How-to-write-a-thesis-A-working-guide.pdf

<https://pdfs.semanticscholar.org/4c45/b4c745a905a3c22790fcd7216c51657cc9de.pdf>

<http://www.iitk.ac.in/doaaold/thesisguide.pdf>

http://www.qu.edu.qa/static_file/qu/research/documents/office-of-graduate-studies-master-project-templateMarch2016-en.pdf

LIFE SPAN NUTRITION

SEMESTER : I

THEORY – 6Hrs /Week

CORE : II

COURSE OBJECTIVES:

To enable students

1. To understand the role of Nutrition during pregnancy, lactation, infancy and other stages of life.
2. To understand the methods of assessment
3. To gain knowledge on nutritional requirements during life span.
4. To learn the techniques of menu planning
5. To correlate the nutritional needs with menu planning

COURSE OUTLINE:

UNIT-I

- a. Nutrition during pregnancy- physiological changes, complications of pregnancy, food and nutrient requirement, pre natal nutrition alterations, general dietary problems and dietary guidelines.
- b. Nutrition during lactation- role of hormones during lactation, factors affecting composition of breast milk, food and nutrient requirement.
- c. Impact of maternal mal nutrition.

UNIT-II

Nutrition during infancy- Growth and Development, food and nutrient requirement, breast feeding VS artificial feeding, feeding pre mature infants, allergies, obesity and sick child. Immunisation schedule.

Nutritional assessment- SGA, LBW, Preterm babies, growth chart, weaning and supplementation.

UNIT-III

- a. Nutrition during preschool age-Growth and Development, nutrition related problems, food habits.
- b. Nutrition during school going age- Growth and Development, Nutritional requirement feeding problems, packed lunch.

UNIT IV

Nutrition during adolescence- physical changes and health needs, food and nutrient requirement, nutritional problems- eating disorders, pre menstrual syndrome, teen age pregnancy, impact of early marriage on health.

UNIT-V

- a. Nutrition during Adulthood: food and nutrient requirement , impact of menopause on women's health, stress related problems
- b. Nutrition during Old age” Physiological changes, food and nutrient requirement , nutrition related problems, dietary modifications.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Gained knowledge of the science of nutrition to human health across the life span
CO2	Developed knowledge on assessment of normal growth and body development
CO3	Understood the nutritional requirements relative to age and developmental stages
CO4	Understood the nutritional requirement during special conditions
CO5	Planned menu for different age groups to meet the nutritional requirements.

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	2

RECOMMENDED TEXTBOOKS:

- B.Srilakshmi, Life Span Nutrition, Seventh Edition (2014), New Age International Publishers

REFERENCES BOOKS:

1. Passmore.Rand Brock.J.D(1989),Human Nutrition and Dietetics, ELBS, Churchic Livingston
2. Krause, M.V., Mallan, L.K(2004), Food Nutrition and Diet Therapy, 11th edition, W.B.Sounders &Co., Philadelphia.
3. Robinson , C.H, Lawlee, M.R,Cherweth, W.L and Garwick,A.E, (1989), Normal and Therapeutic Nutrition, Macmillan Publication Co, New York.

JOURNALS:

- The Journal of nutrition, health and aging
- The Journal of nutrition(American Society for nutrition)

E-LEARNING RESOURCES:

- <https://www.ncbi.nlm.nih.gov> -lactation
- <https://www.ncbi.nlm.nih.gov>-nutrition during infants
- <https://www.hss.gov.nt.ca>>-nutrition for preschoolers
- <https://www.ncbi.nlm.nih.gov>-nutrition during adolescence
- <https://www.ncbi.nlm.nih.gov>-old age problems

ADVANCED FOOD SCIENCE

SEMESTER: I

THEORY – 6Hrs/ Week

CORE: III

COURSE OBJECTIVES:

To enable students to

1. Understand the physiochemical principles underlying food preparation
2. Make them familiar with evaluation of food quality of new standardized food products.
3. Understand the basic food safety issues in the food market
4. Familiarise with physiochemical principles underlying food preparation
5. Gain knowledge on postharvest losses and its preventive measures.

COURSE OUTLINE:

UNIT I

- a. Review of composition and nutritive value of all food groups
- b. Cereal: Processing methods –milling & parboiling, cereal protein- gluten, factors affecting gluten formation, effect of moist heat and dry heat, baking, breakfast cereals, extruded products.
- c. Pulses: processing, toxic constituents, novel soya products – fermented, unfermented products

UNIT II

Vegetables & Fruits –Pigments, Post- Harvest changes and storage, Enzymatic browning, changes during cooking.

UNIT III

Fats and oils, Sugars:

- a. Fat & Oils: Processing and refining of fats, emulsions, rancidity , role of oil in cooking
- b. Sugar cookery: Stages in sugar cookery, crystallization, artificial sweeteners – types and health benefits.

UNIT IV

Flesh foods, eggs & milk

Meat: Types cuts & grades, post-mortem changes, tenderization

Fish –selection classification, uses in cookery

Milk – changes during milk cookery, processing – separation, standardization, pasteurization, homogenization, sterilization, Ultra-High Temperature (UHT)

UNIT V

Evaluation of food quality – Sensory characteristics of food, requirements for conducting sensory tests, sensory methods of analysis- Difference tests, Rating tests, sensitivity tests, Descriptive tests, Tests for objective method – chemical methods, physio – chemical method

FOOD SCIENCE – PRACTICALS

1. Starch cookery - microscopic examination of starch, gelatinization & retrogradation.
2. Batters & Doughs - Preparation of Idli & chappati – sensory evaluation
3. Fats & oils: smoking point, absorption of fat
4. Sugar cookery – stages of sugar cookery with related recipes for each stage
5. Preparation of jams, jellies and custards

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understood the basic concepts in food chemistry and food analysis
CO2	Gained knowledge on food safety
CO3	Developed skills on assessing the quality of new food products using objective and subjective methodologies
CO4	Knew the major chemical reactions that limits shelf life of foods.
CO5	Used the laboratory techniques common to applied food chemistry

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.4	3	3

RECOMMENDED TEXTBOOKS:

- B.Srilakshmi, Food Science, Seventh Edition (2015), New Age International Publishers

REFERENCE BOOKS:

1. Many.Shakunthala,D. AnandShadekasharasway.M, 2001, Food Facts and Principles, 2nd edition, New Age International Ltd publishers, New Delhi.
2. Potter, N.Norman, Hotchkiss, P.JOSEPH, 1997, Food Science, 5th Edition, CBS Publishers and Distributors, New Delhi
3. Parker PICK 2003, Introduction to Food Science, Delmar Thomson Learning. Inc, printed in the USA

JOURNALS

- Journal of Advances in Food Science & Technology
- Journal of Advances in Nutrition and Food Science

E-LEARNING RESOURCES:

- WWW.fao.org--Food and agriculture organization
- WWW.Wfp.org-world food programme
- WWW.foodsafetycouncil.org – international food safety council
- WWW.cfsan.fda.gov – Center for food safety and applied nutrition
- WWW.pubs.acs.org.journal of agricultural and foods chemistry
- WWW.elswvier.com- Food quality and preference
- International journal of Food Science and Technology

QUANTITY FOOD PRODUCTION

SEMESTER : I

THEORY – 6 Hrs /Week

CORE : IV

COURSE OBJECTIVES:

To enable the students

1. To gain knowledge on menu planning, production and service of food
2. To become familiar with kitchen planning and layout
3. To understand the methods of purchase
4. To comprehend the various styles of service
5. To acquire skills in food purchasing

COURSE OUTLINE:

UNIT-I

An overview of food service systems, types of catering, layout plans, flow of work, factors to be considered while planning a food service unit, types of kitchens.

UNIT-II

Quantity food purchase and storage, selection of food- perishable, non perishable, methods of purchase, factors affecting methods of purchase, purchasing procedure, receiving, storage and inventory control and store room records.

UNIT-III

Quantity food production and menu, standardisation of recipes- recipe filling system, formats, types, evaluation and portion control. Menu- definition, types of menus, factors affecting menu planning, steps in menu planning.

UNIT-IV

Styles of services: Table service- English, French, American and Russian, Self Service- cafeteria, counter, free flow, echelon, vending and drive in.

UNIT-V

Food and Beverage Services: Attributes of food and beverage personnel, basic technical skills, interpersonal skills, preparation for services, taking orders, service of food, cleaning. Equipments- Flat Wear, Cutlery, hollow ware. Laying the table, laying covers, napkin folding- Bishops mitre, Rose, Cocks comb and cone.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understood the basic concept of food production and service through menu planning
CO2	Became familiar with evaluation of food quality of standardized products
CO3	Gained knowledge on value of products in the food market
CO4	Equipped to work in catering institutions and industries
CO5	Understood the relationship between menu and other aspects of food service operations.

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3
CO2	3	3	2	3	2
CO3	3	3	3	3	3
CO4	3	3	2	3	3
CO5	3	3	3	3	3
Average	3	3	2.4	3	2.8

Practical:

Napkin Folding- Bishops mitre, Rose, Cocks comb and cone.

RECOMMENDED TEXTBOOKS:

- Dennis Lillicarp, Food and Beverage Service, Dipti Press (OPC) Pvt.Ltd, Edition 2017

REFERENCE BOOKS:

1. West.B. Wood Food Service In Institutions, New York,1995
2. Sethi And Malhan, "Catering Management' Wiley Eastern Limited., 1987
3. Kotschewar.L And Tenal.M.E., " Food Service Planning Layout And Equipment., JOHN Wiley And Sons Limited, 1961
4. Lillicarp, D.R And Cousins. J.A. "Food and Beverage Services"
5. Sudhir Andrews, Text Book of "Food and Beverage Management".

JOURNALS:

- International Journal of Food Properties
- Innovative Food Science and Emerging Technologies

E-LEARNING RESOURCES:

- <http://www.egyankosh.ac.in/bitstream/123456789/33522/1/Unit-12.pdf>
- <https://www.scribd.com/document/75904876/CHAPTER-2-the-Food-Service-System>
- <http://download.nos.org/srsec321newE/321-E-Lesson-7.pdf>
- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=19448>
- <http://cte.sfasu.edu/wp-content/uploads/2015/07/Recipe-Standardization-Process.pdf>
- https://hotelovkasnv.edupage.org/files/Odborna_anglictina_Pb.pdf
- https://www.tutorialspoint.com/food_and_beverage_services/food_and_beverage_services_tutorial.pdf
- <https://www.unileverfoodsolutions.com.ph/chef-inspiration/chefmanship-academy/module-7-service-service-service/topic-1-5-types-of-service.html>
- <https://www.education.gov.pg/TISER/documents/students/short-courses/restaurant-service-table-setting.pdf>

FOOD MICROBIOLOGY

SEMESTER: I

THEORY – 4Hrs/ Week

ELECTIVE: I

COURSE OBJECTIVES:

To enable Students to

1. Understand the methods of spoilage of food.
2. Gain knowledge on role of micro –organisms in relation to food
3. Prevent contamination of food during and after processing and storage
4. Realize the importance of personal hygiene for food handlers
5. Understand the importance of food sanitation methods and quality control.

COURSE OUTLINE:

UNIT – I

Contamination and Spoilage of Perishable Food

- a. Vegetables and Fruits
- b. Milk and Milk Products
- c. Flesh Foods

UNIT – II

Contamination and Spoilage of Non Perishable foods

- a. Cereals & Cereals Products
- b. Sugar & Sugar Products
- c. Fats and Oils

UNIT – III

Foods and Enzymes produced by Micro organisms

Food Fermentations – Bread, Beverages, Vinegar, fermented vegetables and fermented dairy product

UNIT – IV

Food borne Illnesses – Food Poisoning – Infection and Intoxication. Sources of Contamination of Foods – Toxin Production & physiological action of selected types – Signification of toxic organisms like. C.botulinum, C.perfringens and Staphylococcus

UNIT – V

Food Sanitation and Quality Control

Microbiology of Food Products – HACCP, Health of Employees,

Quality Control – Enforcement and Control Agencies.

Related Experiences:

Examine the spoilage of selected perishable and non- perishable foods.

Prepare any five fermented food products

Visit a Hostel to find out the hygienic practices followed while preparing food

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Familiar to utilize the simple methods to identify the microorganisms in food

CO2	Became aware of the role and significance of microbial spoilage
CO3	Applied the principles involved in food preservation
CO4	Oriented towards sanitary techniques in food handling
CO5	Understood and apply personal hygiene for prevention of food borne illness

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	3
CO2	3	3	2	2	3
CO3	3	3	1	3	3
CO4	3	2	2	1	1
CO5	3	3	3	2	3
Average	3	2.6	2	2.2	2.6

RECOMMENDED TEXTBOOK:

- Purohit S.S. Microbiology – Fundamentals and Applications, 6th ed, Agrobices Indiana 2002
- Patel P.H. Industrial Microbiology, Mc, Millan India Co., New Delhi 1996

REFERENCE BOOKS:

1. Adam,M.R. & Moss. M.O. Food Microbiology. New Age International (P) Ltd, New Delhi 1996.
2. FrazierC.&Denis W.C. Food Microbiology,4th edition. Tata Mc Graw Hill Publishing Co New Delhi 2002.
3. James,M.J., Modern Food Microbiology. 4th ed Chapman and Halls, New York 2003.
4. Dubey, R.C. Textbook of Biotechnology S. Chand & Co 1st ed New Delhi 2002 John E, Smith Biotechnology 3rd ed, Cambridge University Press, London 1996.
5. Steiner,R.X., The Microbiology world 5th ed. Prentice Hall of India, New Delhi, 1986.
6. Ananthakrishnan C.P. SinghR.B.& Padmanabhan P.N. –Dairy Microbiology, Sri Lakshmi Publications, Chennai 1994.
7. Casida, L.E. Industrial Microbiology, New Age International Pvt Ltd New Delhi 1996

JOURNALS:

- International Journals of Food Microbiology
- Journal of Food Industrial Microbiology

E-Learning resources:

- <http://www.open.edu>- spoilage & contamination of perishable food
- <http://www.open.edu>- spoilage & contamination of perishable food

- cdn.intechweb.org- food fermentation
- <https://www.cdc.gov>- food borne illness
- <https://ehs.utexas.edu>- food sanitation

PUBLIC HEALTH NUTRITION

SEMESTER : II

THEORY- 5 Hrs/week

CORE : V

COURSE OBJECTIVES:

To enable the students to

1. Sensitize to the nutritional problems of the community
2. Gain skills in planning, executing and evaluating nutritional projects

3. Understand the importance of food security
4. Gain knowledge in organizing nutrition education camp in the community
5. Develop strategies to enhance the nutritional status of the community.

COURSE OUTLINE:

UNIT I

Nutrition and National Development- Ecology and spectrum of health, Health indicators, balance between food and population growth-Food security, agricultural production, storage and distribution.

UNIT II

Assessment of nutritional status-significance, need, methods- Direct method and Indirect method.

UNIT III

Nutritional deficiency disorders-PEM, Anaemia, vitamin A deficiency, IDD, Fluorosis, communicable diseases-Epidemiological transition: Typhoid, Tuberculosis, Malaria, AIDS, STD, Cholera, Viral Hepatitis.

UNIT IV

- a. Role of national and international organization- NIN,ICMR,ICAR,CFTRI,CSWB,SSWB,NNMB,NFI,FAO,WHO,UNICEF,CARE,World bank
- b. Role of programme: ICDS, CMNMP, ANP, SNP, TNIP, Prophylaxis programmes.

UNIT V

- a. National Nutrition policy
- b. Nutrition Education- methods, types and uses of audio visual aids
- c. Role of computer in Nutrition Education

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Acquired knowledge of the role of nutrition in maintaining health
CO2	Applied the role of nutrition in healthy eating and prevent diseases
CO3	Analyzed the relationship between nutritional health and food selection
CO4	Developed strategies based on current issues for promotion of nutritional well-being among the people.
CO5	Promoted employability skills in various health sectors.

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

RECOMMENDED TEXTBOOKS:

- K.Park,(2000), Preventive and Social Medicine, 16th Edition, Banarsidas Bhanot publishers, Jabalpur

REFERENCES:

1. Jellifee D.B(1996), The assessment of nutritional status in the community-WHO Monograph series –No:53, Geneva
2. Shanthi Ghosh (1977), The Feeding and Care of Infants. Voluntary Health Association of India, New Delhi
3. Shukla.P.K (1982), National Problems Of India – Prentice Hall of India Pvt Ltd, New Delhi.
4. V.V.R.Seshubabu (1996), Review in Community Medicine, Paras Medical Books, Hyderabad.
5. K.Park,(2000), Preventive and Social Medicine, 16th Edition, Banarsidas Bhanot publishers, Jabalpur

JOURNALS:

- Journal of Public Health and Nutrition (International Journal)
- Journal of Health, Population and Nutrition

E-Learning Resources

- <http://agritech.tnau.ac.in-agriculturalproducts>
- <https://www.ncbi.nlm.nih.gov-nutritionalassessment>
- <https://www.medicalnewstoday.com-anemia>
- <https://www.nhp.gov.in/national-vitamin-a-prophylaxis-program-pg>
- [https://www.dshs.wa.gov/altsa/program- services/nutrition-education](https://www.dshs.wa.gov/altsa/program-services/nutrition-education)

CLINICAL NUTRITION

SEMESTER : II

THEORY – 6 Hrs /Week

CORE : VI

COURSE OBJECTIVES:

Enable students to:

1. Gain knowledge on different aspects of clinical nutrition.
2. Understand the significance of clinical findings.
3. Interpret clinical findings with health status
4. Understand the basic medical terminology in health and disease.
5. Familiarise with the nutritional aspects of disease management.

COURSE OUTLINE:

UNIT-I

Disorders of Gastro-Intestinal Tract

- a. Chemical Pathology, Gastric Function Test, Endoscopy.

- b. Common Intestinal Problem- Constipation, Diarrhoea, Gastritis, Diverticulitis, Flatulence.
- c. Mal Absorption Syndrome – Tropical Sprue, Steatorrhoea.

UNIT-II

Disorders of Liver, Gall Bladder and Pancreas

- a. Functions of Liver, Clinical Significance Of Altered Bilirubin Level, Liver Function Test, Pancreas Function Test.
- b. Disorders- Pancreatitis, Fatty Liver, Hepatitis, Cirrhosis of Liver, Gall Stones.

UNIT-III

Disorders of Renal System

- a. Concept of renal clearance, excretion of creatinine, urea and uric acid, dialysis- principles and types.
- b. Types, clinical manifestation, laboratory diagnosis of acute and chronic nephritis, nephrotic syndrome, renal failure.

UNIT-IV

Disorders of Metabolism

- a. Importance of Carbohydrates, Proteins And Fat Metabolism, Estimation Of Glucose By Gtt., Screening For Carbohydrate Intolerance, Test For Ketones.
- b. Disorders- Diabetes and Hypoglycemia, Gout, PKU, MSUD, Galactosemia- Etiology, Diagnosis Test.

UNIT-IV

Disorders of Lipid Metabolism

- a. Lipid Profile, Serum Total Cholesterol, Triglycerides, Phospholipids, Lipoproteins, Lipotropic Factors.
- b. Disorders- Atherosclerosis, CHD, Stroke, Hypertension.
- c. **COURSE OUTCOMES:**

CO Number	CO STATEMENTS
CO 1	Demonstrated knowledge of nutrition principles and their application to disease prevention and management.
CO2	Gained knowledge of medical terminology and medical abbreviations associated with nutrition related diseases and conditions
CO3	Collect, organise and assess data relating to the health and nutritional status of individuals
CO4	Acquired skill in maintaining and improving health status
CO5	Able to perform nutritional assessment.

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	2.6	2.6	3	3

RECOMMENDED TEXTBOOKS:

- B.Srilakshmi, Clinical Nutrition, Seventh Edition (2014), New Age International Publishers
- S.Paul,2007, A text Book Of Bio- Nutrition(Caring Disease Through Diet) CPS Publishers And Distributors

REFERENCE BOOKS:

1. Viswanath Sardesai. 2011. Introduction to clinical Nutrition, III Edition.
2. Joshi, Joshi. Y.K.2008. Basics of Clinical Nutrition
3. S.Paul,2007, A text Book Of Bio- Nutrition(Caring Disease Through Diet) CPS Publishers And Distributors.
4. Michael. J.Gbney, 2005, Clinical Nutrition. Black Well Publishing.
5. Williams D.L, And Vincent. R, Biochemistry in Clinical Practices, 1990.

JOURNALS

- The American Journal of Clinical Nutrition
- Journal of Clinical Nutrition and Metabolism

E-LEARNING RESOURCES

- <https://medlineplus.gov/malabsorptionsyndromes.html>
- <https://liverfoundation.org>nutrition>
- <https://www.kidney.org-dialysis>
- <https://www.niddk.nih.gov-hypoglycemia>
- <https://www.nhlbi.nih.gov-atherosclerosis>

HOUSEKEEPING AND FRONT OFFICE

SEMESTER-II

THEORY-5 Hrs/Week

CORE: VII

COURSE OBJECTIVES:

Enable students

1. To understand the structural organization of Housekeeping and front office.
2. To be aware of the functioning of Housekeeping and Front Office and other coordinating departments
3. To develop skills in effective housekeeping practices
4. To understand the operational procedures in Front office
5. Develop competency in handling cleaning devices

COURSE OUTLINE:

UNIT-I

Housekeeping Department-layout of Housekeeping Department – Organisation, coordinating departments, Job Description of the Housekeeping Personnel- Manning – Recruitment, selection and Training. Briefing and scheduling of Staff Etiquettes of Housekeeping Staff.

UNIT – II

Housekeeping Practices

Room cleaning Procedure-The Maid's Cart, Cleaning methods, agents, Pest control and equipments, lost and Found procedure , Linen and Uniform Room- Equipment and accessories for linen. Types of Linen, Inventory Control and Budgeting.

UNIT – III

Front office Management, Organisation Pattern in small, medium and large sized hotels. Functions of Front Office Staff – Manager, Assistant Manager, Cahier, GRE, Receptionist, Reservation Manager, Front office Assistants, Night Manager, Clerical Staff Bell Captain and Bell Boy.

UNIT – IV

Tariff structure Fixation, Tariff Card – stages of Guest contact with the Hotel Guest Arrival, Preparing, receiving, registration procedure – systems of Registration.

UNIT – V

Guest Accounting

Account keeping – Guest ledger – city ledger, Guest accounting Process. Night auditing, Departure procedure, Significance of Electronic Front Office.

Related Experience. Collect information on the latest innovations and trends in housekeeping. Visit a Star Hotel.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Highly developed organizational abilities
CO2	Developed strong time management skills and workplace punctuality
CO3	Developed strong time management skills and workplace punctuality
CO4	Understood the importance of guest handling practices
CO5	Understood the role and function of front office

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	2	3	3
CO4	3	2	2	3	3
CO5	3	3	3	3	3
Average	3	2.8	2.6	2.6	3

RECOMMENDED TEXTBOOKS:

- Sudhir Andrews, Text book of Front office Management and operation, Tata Mc Graw Hill Ltd Delhi 2008.
- Anitha Banerjee & Dr. Chakravarthy. B.K.Housekeeping Management in Hotels. ABH Publishing Corporation, New Delhi 2007.

REFERENCE BOOKS:

1. Branson, C.J & Lennox, M. Hotel, Hostel and Hospital Housekeeping Arnold Heineman, 5th edition, London 2005.
2. Jane Fellows, Housekeeping Supervision pitman publishing co. 1996.
3. Raghubalan, G.& Smrita Raghubalan. Hotel housekeeping and Operations 1st edition Oxford University Press. New Delhi 2007.
4. Ravi Aggarwal, Hotel Front office, Systems and Procedures Sublime Publications- Jaipur India 2002.
5. Sudhir Andrews, hotel housekeeping – Training Manual Tata Mc Graw Hill Ltd. Delhi 2006

JOURNALS

- International Journal of Research
- Clean India Journal

E-LEARNING RESOURCES:

https://www.tutorialspoint.com/hotel_housekeeping/hotel_housekeeping_introduction.htm

https://www.tutorialspoint.com/hotel_housekeeping/hotel_housekeeping_tutorial.pdf

<http://www.uou.ac.in/sites/default/files/slm/HM-103.pdf>

<https://htzagreb.files.wordpress.com/2016/07/housekeeping-training-materials.pdf>

<https://www.hospitality-school.com/hotel-linen-room-housekeeping/>

<http://bieap.gov.in/Pdf/HOPaperIIIR2.pdf>

<http://www.anucde.info/14-11->

[2018%20Online%20Study%20Material/BHM/DBHM04%20Front%20Office%20Procedures.pdf](http://www.anucde.info/14-11-2018%20Online%20Study%20Material/BHM/DBHM04%20Front%20Office%20Procedures.pdf)

QUANTITY FOOD PRODUCTION PRACTICALS

SEMESTER-II

THEORY-6 Hrs/Week

CORE: VIII

COURSE OBJECTIVES:

Enable the students

1. To gain knowledge on menu planning,
2. To Standardize various South and North Indian dishes
3. To learn about service of food
4. To familiarize with product evaluation techniques
5. To gain skill in portion control.

COURSE OUTLINE:

1. Planning menus for South Indian , North Indian, Western & Chinese meal
2. Standardisation of South Indian Breakfast
3. Standardisation of North Indian Breakfast
4. Standardisation of Continental Breakfast
5. Standardisation of South Indian course meal
6. Standardisation of North Indian course meal
7. Stepping up of selected recipes using factor method
8. Demonstration of Table setting & napkin folds

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Developed products by testing and evaluation
CO2	Became entrepreneurs through marketing of developed products
CO3	Learnt about standardization of recipes
CO4	Skilled in stepping up of recipes of different cuisines
CO5	Familiarised with appropriate purchasing procedures and issuing

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	3
CO2	3	3	3	3	3
CO3	2	2	2	3	3
CO4	3	3	3	2	3
CO5	3	2	2	2	3
Average	2.8	2.6	2.6	2.4	3

RECOMMENDED BOOKS:

- Sethi And Malhan, “Catering Management’ Wiley Eastern Limited., 1987

REFERENCE BOOKS:

- West.B. Wood Food Service In Institutions, New York,1995
- Sethi And Malhan, “Catering Management’ Wiley Eastern Limited., 1987
- Kotschewar.L And Tenal.M.E., “ Food Service Planning Layout And Equipment., JOHN Wiley And Sons Limited, 1961
- Lillicarp, D.R And Cousins. J.A. “Food and Beverage Services”
- Sudhir Andrews, Text Book of “Food and Beverage Management”.

JOURNALS

- The Journal of Physiology
- International Journal of Anatomy and Physiology

E-LEARNING RESOURCES:

- <http://www.egyankosh.ac.in/bitstream/123456789/33522/1/Unit-12.pdf>
- <https://www.scribd.com/document/75904876/CHAPTER-2-the-Food-Service-System>
- <http://download.nos.org/srsec321newE/321-E-Lesson-7.pdf>
- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=19448>
- <http://cte.sfasu.edu/wp-content/uploads/2015/07/Recipe-Standardization-Process.pdf>
- https://hotelovkasnv.edupage.org/files/Odborna_anglictina_Pb.pdf
- https://www.tutorialspoint.com/food_and_beverage_services/food_and_beverage_services_tutorial.pdf
- <https://www.unileverfoodsolutions.com.ph/chef-inspiration/chefmanship-academy/module-7-service-service-service/topic-1-5-types-of-service.html>
- <https://www.education.gov.pg/TISER/documents/students/short-courses/restaurant-service-table-setting.pdf>

HUMAN PHYSIOLOGY

SEMESTER: II

THEORY – 4 Hrs/ Week

ELECTIVE: II

COURSE OBJECTIVES:

Enable students to

1. Understand the structure of major human organs and their roles in maintaining healthy individual.
2. Critically evaluate the interrelationship between different organ systems to maintain biological equilibrium in the face of changing environment
3. Learn about specific physiological disorders and diseases of the human body.
4. Understand the pre disposing factors and symptoms of disease.
5. Develop knowledge on digestion of food.

COURSE OUTLINE:

UNIT I

DIGESTIVE SYSTEM:

Brief description of organs of the GI tract. Accessory organs of the Digestion-Liver, gall bladder and pancreas,

Digestion and absorption of food

Common disorders: vomiting, diarrhoea, constipation hyperacidity,

UNIT II

RESPIRATORY SYSTEMS:

Respiratory organs and their functions-Nose, Larynx, Trachea, bronchi and lungs

UNIT III

EXCRETORY SYSTEMS:

Structure and function of organs of urinary system (in brief) Mechanism of urine formation.

Common disease of Urinary system-UTI, Renal stones

Skin- Structure and functions, Regulation of body temperature

UNIT IV

CARDIOVASCULAR SYSTEM:

Blood : Composition, functions of each constituents of blood in brief. Blood clotting and its significance.

Blood groups. Blood transfusion and its importance,

Structure of Human Heart and functions-Cardiac cycle . ECG and its importance, Blood pressure, Pulse pressure

UNIT V

ENDOCRINE SYSTEM

Hormones- Principles of action and endocrine control, synthesis, secretion

Biological effect of pituitary, thyroid, parathyroid, adrenal, pancreas, male and female reproductive Hormones.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understood the physiological process of all body system
CO2	Gained knowledge on the physiological factors and diseases of human body
CO3	Identified the structure of various organs
CO4	Understood how the activities of organs are integrated for maximum efficiency
CO5	Aware of physiological process accurately and concisely using relevant scientific terminology

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	2	2	2	2
CO5	3	3	3	2	3
Average	3	2.8	2.6	2.6	2.8

RECOMMENDED TEXTBOOKS:

- Chaudhuri, A.R(2000), “Text of Practical Physiology”, Paras Publishing, Hyderabad
- Guyton, A.C. and Hall (2001), “Textbook of Medical Physiology”, Xth edition, Harcourt Asia Pvt.Ltd., Singapore.

REFERENCE BOOKS:

- a. Hoffman, J.F. and Jamieson, J.D. (1997), “Cell Physiology”, Oxford University Press, New York.
- b. Chakrabarthy, (1994) “Human Physiology” ,The New Book Stall, Calcutta.
- c. Joshi, V.D (1995) “Physiology – preparation Manual for Undergraduate”, Churchill Livingstone, New Delhi.
- d. Jain,A.K(2013) , “ Text of Physiology”, Arichal Publishing Company.

- e. Brown , H.(1997), “Physiology and Pharmacology of the Heart”, Oxford Blackwell Science, New York.
- f. Mackenna and Callender (1998), “Illustrated Physiology”, Churchill Livingstone, New York.
- g. Ross and Wilson(2005), “Anatomy and Physiology in Health and Illness” Churchill Livingstone, New York.

JOURNALS:

- The Journal of Physiology
- The International Journal of anatomy and Physiology

E-LEARNING RESOURCES:

- <https://www.medicinenet.com-digestive system>
- <https://www.betterhealth.vic.gov.au/health/conditionsand treatment/respiratory-system-respiratory system>
- <https://www.ncbi.nlm.nih.gov/pmc-excretory system>
- <https://www.cancerindex.org-cardiovascular system>
- <https://labtestsonline.org-cardiovascular system>
- www.americanheart.org-cardiovascular system
- <https://medlineplus.gov/endocrine system.html-endocrine system>

ENTREPRENEURSHIP MANAGEMENT

SEMESTER: II

THEORY –4Hrs /Week

EXTRA DISCIPLINARY ELECTIVE: I

COURSE OBJECTIVES:

Enable students

- To learn the concept of Entrepreneurship development
- To inculcate the Entrepreneurship skills
- To enhance job creators from job seekers
- To understand the various infrastructure for employment and income generation
- To acquire skills in planning project proposals

COURSE OUTLINE:

UNIT I

Entrepreneurship- meaning and definition, Types- Qualities of an Entrepreneur, Classification of Entrepreneur – Factors influencing Entrepreneurship

UNIT II

Agencies promoting Self Employment: LEARNING OUTCOMES- functions and assistance given by Central Social Welfare Board – Commercial Banks- District Industries Centre- TRYSEM- All India Financial Institutions- IDBI,IFCI, ICICI,IRDBI, DWRCA

UNIT III

Project report

Meaning and definition of project- Project Formulation-Planning Commissions guidelines for formulating a project report- Procedure for applying for Licenses, Registration of units

UNIT IV

Marketing Management- Concept of Management- Steps in conducting Market Survey- Marketing Mix- Pricing Policy- Methods of marketing – Departmental purchase

UNIT V

Women Entrepreneurs- Problems faced by Women Entrepreneurs. Self Help Groups, Special assistance by given to women Entrepreneurs by Government, Financial Institution and NGO'S

Related Experience:

1. Visit to units runs by Women entrepreneurs
2. Working out a Project proposal
3. Visit to exhibition by Self help groups
4. Organising an exhibition cum sale of products
5. Visit to small scale and cottage Industries

COURSE OUTCOMES:

CO Number	CO STATEMENTS

CO 1	Developed advanced knowledge on assessing business opportunities and in-depth understanding of entrepreneurial voyage.
CO2	Gained knowledge about key processes necessary to bring new products and services to market and key challenges facing the entrepreneur at different stages
CO3	Understood the dynamics of how teams develop and function as well as the various types of conflicts which arise during teamwork
CO4	Learnt about sources of finance available for entrepreneurs
CO5	Able to plan, organize and execute a project or new venture and transform it into a fully-fledged business opportunity.

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	2	1	3
CO4	3	3	2	1	3
CO5	3	3	2	2	3
Average	3	3	2.4	1.6	3

RECOMMENDED TEXT

1. Bhatia, B.S. Bhatia, G.S., Entrepreneurship and small Business Management , Deep and Deep Publication , (P) Ltd, Delhi. 2001

REFERENCE BOOKS:

1. S.Anil kumar., S.C.Poornima,, K.Mini Abraham and Jayashree,-Entrepreneurship Development, New Age International (P) Limited Publishers. Delhi, 2008
2. Dr. V.Balu,-Entrepreneurial Development, Sri Venkateshwara Publications, Chennai, 2005
3. Bhatia, B.S. Bhatia, G.S., Entrepreneurship and small Business Management , Deep and Deep Publication , (P) Ltd, Delhi. 2001
4. Chandra Prasanna, Project planning – Analysis, Selection , Implementation and Review, Tata McGraw Hill CO. 2000
5. Dewhurst, J., Burns Paul ., - Small Business Management, Mac Millan. 2003
6. Dr. C.B.Gupta and S.S. Kanka, Entrepreneurship and small business management, Sultan Chand and sons., New Delhi. 2008

JOURNALS:

Economic Survey-2000-2001, Government of India

E LEARNING RESOURCES

- https://www.researchgate.net/publication/311495235_Entrepreneurship_Management
- <http://www.pondiuni.edu.in/sites/default/files/Entrepreneurship%20Managementt200813.pdf>
- http://shodhganga.inflibnet.ac.in/bitstream/10603/96618/10/10_chapter%202.pdf
- http://entrepreneuriat.inforoutefpt.org/documents/ang_nc-4328_projet.pdf
- <https://www.cbd.int/doc/guidelines/fin-dk-gd-lns-prep-en.pdf>
- https://dpi.wi.gov/sites/default/files/imce/cte/pdf/mme_standards.pdf
- https://www.researchgate.net/publication/228907037_Entrepreneurial_marketing_Moving_beyond_marketing_in_new_ventures
- https://www.researchgate.net/publication/304024317_STATUS_OF_WOMEN_ENTREPRENEURSHIP_IN_INDIA
- http://shodhganga.inflibnet.ac.in/bitstream/10603/6775/12/12_chapter%201.pdf
- <http://www.oecd.org/cfe/smes/31919215.pdf>

THERAPEUTIC NUTRITION AND DIET

SEMESTER: III

THEORY-6 Hrs/Week

CORE: IX

COURSE OBJECTIVES:

Enable students

1. To obtain knowledge about therapeutic diets.
2. To develop skills in planning diet during diseased condition.
3. To learn recent concepts in dietary management.
4. To understand the importance of antioxidants in disease prevention

5. To apply the scientific principles in planning diet.

COURSE OUTLINE:

UNIT-I

Basic concepts in Diet therapy-Food nutrient and Drug interaction. Routine Hospitals Diets. Special Feeding methods, TPN, pre and post operative diets. Obesity-Etiology, Assessment, Dietary Management and prevention. Diabetes mellitus – Classification, Symptoms, meal plan with and without Insulin, Diabetes in pregnancy, juvenile Diabetes, Diabetic coma.

UNIT-II

Diseases of Gastrointestinal tract- indigestion, Peptic ulcer, constipation, Diarrhoea, celiac diseases, Irritable bowel syndrome- Etiology, Symptoms and Dietary management, Gastric Surgery.

Infective hepatitis, cirrhosis of liver, Cholelithiasis, Cholecystitis. Etiology Symptoms and Dietary management.

UNIT-III

Diseases of kidney and Endocrine system

Kidney-Etiology, Symptoms and Dietary Management in Nephritis, nephrosis, Renal Failure, urolithiasis, dietary modification for dialysis. Endocrine system-Etiology, Symptoms and Dietary Management of Disorders of Thyroid, pituitary and Adrenal Cortex.

UNIT – IV

Disease of Cardio vascular system Etiology, Symptoms, Dietary Management and prevention of Atherosclerosis, hypertension, hyper cholesterolemia and heart failure. Role of fat in the development of Atherosclerosis. Functional foods for CHD.

UNIT – V

Dietary Management in cancer, Genetic Disorders and Diseases of Musculoskeletal system. Cancer –Risk Factors, patho physiology, signs and symptoms, nutrition intervention and Role of Functional Food in th Cancer prevention.

Genetic Disorders – Etiology, symptoms and Dietary management of Phenylketonuria, Galactosemia, Fructosuria.

Musculoskeletal system – Dietary Management of Rheumatoid arthritis, osteoarthritis, osteoporosis.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understood the core concept in therapeutic diets
CO2	Understood the role of food and nutrients in health and disease
CO3	Gained knowledge about planning diets for diseases
CO4	Became aware of appropriate prevention and intervention strategies for diseases
CO5	Integration of scientific information products in practice

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	2.8	3	3

RECOMMENDED TEXT BOOKS

- Krause, M.V., Mahan, L.K. 2004, Food, Nutrition and Diet Therapy, 11th edition, W.B.Saunders & Co. Philadelphia.
- Sri lakshmi. B., 2004, Dietetics. Chennai, New Age International pub.Co

REFERENCES BOOKS:

1. Antia, F.B., 1973, Clinical Nutrition and Dietetics. London, Oxford University Press
2. Cataldo, C.B., Debryme, L.K. and Whitney, E.N.1995, Nutrition and Diet Therapy, 4th Edition, West Publishing Co.
- 3.Garrow, J.S., James, W.P.T, and Ralph Ann, 2000. Human Nutrition and Dietetics, Ninth Edition, Longman Singapore Publishers Pvt.Ltd.
- 4.Gopalan, C. Balasubramanian, S.C. and Ramasastry, B.V. (2002).The Nutritive value of Indian Foods, ICMR, New Delhi.
- 5.Guthrie, A.H. (1993) Introduction to Nutrition, C.V.Mosbey Co., St. Louis.
- 6.Passmore, R. Brock, J.B.(1989). Human Nutrition and Dietetics, ELBS, Churchill Livingstone.
- 7.Robinson, C.H., Lawler, M.R.,Cherweth, W.L., and Garwick, A.E., 1986, Normal and Therapeutic Nutrition, Macmillan publication Co. New York.
- 8.Stanfield p.S.1992, nutrition and Diet Therapy, Second edition, Jones and Bartlett publishing Co.

JOURNALS:

- Journal of Nutritional Medicine and diet care
- International Journal of clinical nutrition and Dietetics

E LEARNING RESOURCES:

- <http://www.adaevidencelibrary.com/topic.cfm>
- <https://liverfoundation.org>nutrition>
- www.kidney.org
- <http://www.nlm.nih.gov/medlineplus/metabolicdisorders>

- <http://www.heart.org>
- <http://www.nlm.nih.gov/medlineplus/metabolicdisorders>

BAKERY AND CONFECTIONARY

SEMESTER : III

THEORY – 5 Hrs /Week

CORE: X

COURSE OBJECTIVES:

Enable students

1. To study the types of bakery and confectionary products
2. To understand the principles of baking and confectionary
3. To develop skills for setting up Bakery & Confectionary unit
4. To familiarize with major and minor equipments used in Bakery
5. Develop aesthetic quality in cake art.

COURSE OUTLINE:

UNIT I

BAKING

Principles of Baking, role of ingredients-flour, water, yeast, sugar, shortening, milk, egg, butter, salt and leavening agents,, flavourings, fruits, nuts.

UNIT II

PREPARATION & DECORATION OF COOKIES AND CAKES

Cookies: Types of cookies, Steps in making cookies. Cake making- types of cake, Methods of mixing cakes, cake faults and causes and types of icing.

UNIT III

PREPARATION OF BREAD AND PASTRY

Preparation of bread, Types of bread, Bread faults, staling of bread. Types and preparation of pastry.

UNIT IV

STARTING A BAKERY UNIT

Major and Minor Equipments used in bakeries. Steps in starting a bakery unit

UNIT V

CONFECTIONERY

Types of confectionery, raw material used. preparation of toffee, chocolates fruit drops, marshmallow, hard boiled candies, bars and Indian Sweets.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Gained knowledge in methods of preparation of bakery products
CO2	Became aware of types of appliances used in baking
CO3	Learnt the steps involved in starting a bakery
CO4	Understood the scope of confectionery
CO5	Equipped to meet the current needs of food service environments.

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	3
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	2	3	3
Average	3	2	2	3	3

RECOMMENDED TEXT BOOKS

- Text book of Bakery and Confectionary, yogambal ashokumar 2nd edition, (2018), PHI learning (P) limited Delhi.

- A professional text to bakery and confectionary, John kingslee, First edition (2014), New age international (P) Limited publishers

REFERENCES BOOKS:

1. Sethi.M & Malhar.S. Catering Management an integrated approach, Wiley Eastern Ltd, New Delhi, 2008
2. Dubey, S.C.Basic baking science craft, Jwalmukthi, Job Press, Bangalore, 2004
3. Potter,N.N and Hortenkiss, J.H, Food Science, v edition, CBS Publishers an distributors, New Delhi, 2007
4. Bakers hand book on practical baking(1998) Compiled and Published by US Wheat Associates

JOURNALS:

- American Journal of Food Science and Technology
- Journal of Culinary Science and technology

E LEARNING RESOURCES:

- www.nios.ac.in>media>documents>bakery
- www.indian-cooking.info>Ebooks>cakes-desserts
- <https://epdf.pub>understandingbaking-the> art and science of baking
- <https://bakerpedia.com>
- https://fssai.gov.in/guidancedocument_bakerysector
- <https://portal.blisd.ca>public>documents>professionalbaking6thedition>
www.eiilmuniversity.co.in>downloads>bakeryandconfectionery

PERSPECTIVES IN HOME SCIENCE

SEMESTER: III

THEORY – 5 Hrs/ Week

CORE: XI

COURSE OBJECTIVES:

Enable students

1. To study of the importance of different fields of Home Science
2. To understand the new trends and development in the various fields of Home Science
3. To develop skills to serve the community
4. To understand the importance of various streams of Home science.
5. To recognize thrust areas in the field of Home Science.

COURSE OUTLINE:

Unit I

HOME MANAGEMENT

- (i) Concept and principles of Home Management

- (ii) Management of Resources- Classification and basic characteristics
- (iii) Work simplification- Importance of work simplification in human, Mundel's classes of changes.
- (iv) Interior Design: Elements and principles of design, colour-prang colour system, colour harmonies.

Unit II

FOOD, NUTRITION AND INSTITUTIONAL MANAGEMENT

- (i) Food science and food analysis- space foods, factors considered in preparation of space foods
- (ii) Methods of improving nutritional quality- fortification and enrichment , criteria for food fortification
- (iii) Management process and functions.

Unit III

TEXTILE AND CLOTHING

- (i) Textile fibers- General properties and structure
- (ii) Yarns- Definition, Classification, Identification and its uses in various places.
- (iii) Fabric construction- Definition and woven, non-woven, knitted and other construction techniques.
- (iv) Clothing-Principles, socio-psychological aspects .Selection of fabrics, clothing and family clothing.

Unit IV

HUMAN DEVELOPMENT

- (i) Principles and stages of child rearing , socialization practices.
- (ii) Early childhood care and education
- (iii) Development problems and disability during childhood and adolescence.
- (iv) Management of social institutions- family- functions of family, features of modern families. Geriatric institutions- functions and features.

Unit V

FORMAL AND NON-FORMAL AND EXTENSION EDUCATION

- (i) Formal, Non-formal and Extension Education-Definition, differences, teaching aids.
- (ii) Development of extension education in Home Science-curriculum planning and development, monitoring, supervision and evaluation of formal, Non-Formal and extension education.
- (iii) Theories and principles of guidance and counseling.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Identified the evolution, meaning, importance, thrust areas in Home Science and scope of Home Science
CO2	Developed qualities needed for responsible citizenship and improve quality of life
CO3	Gained knowledge for higher studies and job opportunities
CO4	Acquired knowledge, skill and attitude to work with the communities

CO5	Sensitized on the issues of society

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	2	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	2.8	3	3	3

RECOMMENDED TEXT BOOKS

- V.K Dubey, Indira Bishnoi, Extension education and communication
First Edition (2008), New age international publisher

REFERENCE BOOKS:

1. K.Park,(2000), Preventive And Social Medicine, 16th Edition, Banarsidas Bhanot Publishers, Jabalpur
2. Sethi And Malhan, “ Catering Management” Wiley Eastern Limited, 1987.
3. Kotschewar.L.And Tenal, M.E, “ Food Service Planning Layout And Equipment, John Wiley And Sons Limited, 1961
- 4.Gross And Crandall, Management For Modern Families, Sterling Publishing(P) Ltd.1967.
5. Dubey AND Bishoni, Extension Education And Communication, New Age International Publishers, 2008.

JOURNALS:

- International Journal of Home Science, Extension and Communication skills
- Perspectives in Science

E LEARNING RESOURCES:

- <http://www.nmdhb.govt.nz>
- <https://www.nasa.gov/aeroresearch/resources/artifact-opportunities/space-foods>
- <https://www.scribd.com/doc>
- <http://www.unicef.org/education/early-childhood-education>
- <http://www.ncbi.nlm.nih.gov/books>

FUNDAMENTALS OF STATISTICS AND DATA ANALYSIS

SEMESTER : III

THEORY: 4 Hrs/Week

ELECTIVE: III

COURSE OBJECTIVES:

To enable the students to

1. Learn about tools used in data collection.
2. Obtain knowledge about various applications of statistics in the research.
3. Gain knowledge about collection and tabulation of data.
4. Learn about various statistical methods.
5. Familiarize with the use of SPSS

COURSE OUTLINE:

UNIT I

Types of variables & scale, frequency distribution-properties
Classification & Tabulation of Data, Diagrammatic & Graphic presentation

UNIT II

- a) Measures of Central Tendency- Mean, Median, Mode
- b) Measures of Dispersion- SD, Variance

UNIT III

Correlation & Regression-
Pearson's Co-efficient of Correlation, Pearson's rank correlation, Interpreting Co-efficient of Correlation
Regression – uses,

UNIT IV

Tests of Hypothesis. Large, small sample test- 't' test, 'f' test, Chi-square and Analysis of Variance

UNIT V

Introduction to SPSS, Opening a data file in SPSS, Entering & Editing data, importing data, uses of SPSS for descriptive statistics.

't' test, ANOVA, Correlation & linear regression analysis.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Developed skill in data collection
CO2	Collect and code data effectively
CO3	Apply principles of classification and tabulation of data
CO4	Understood the descriptive and inferential methods in statistical analysis
CO5	Identified research problems and tested hypothesis

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	2	3	3
CO3	3	3	2	3	3
CO4	3	3	2	3	3
CO5	3	3	2	3	3
Average	3	3	2.2	3	3

RECOMMENDED TEXT BOOKS

- Fundamental of applied statistic, sultan chand & sons 4th edition (2007), educational publishers, New Delhi.
- Statistical Method'', S.P. Gupta, Sultan Chand & Sons, Educational Publishers, 23 Drayage, New Delhi – 110002, 2001.

REFERENCES :

1. 'Kothari C.K. (2004), 2/e, Research Methodology –Methods and Techniques (New Age International, New Delhi).
2. Guru Mani N (2010) Scientific Thesis Writing and Paper Presentation, MJP Publishers, Chennai.
3. Sharma, K.R 2002. Research Methodology. National Publishing House, Jaipur, New Delhi.
4. Thakur, D. 2003. Research Methodology in social. Deep & Deep Publications, New Delhi.
5. Rajathi,A., Chandran,P.,(2010) SPSS for you. MJP Publishers , Chennai

JOURNALS:

- Journal of Fundamental and Applied Statistics
- International Journal of Statistics and Analysis

E LEARNING RESOURCES:

https://www.student.uwa.edu.au/_data/assets/pdf_file/0007/1919239/How-to-write-a-thesis-A-working-guide.pdf

<https://pdfs.semanticscholar.org/4c45/b4c745a905a3c22790fcd7216c51657cc9de.pdf>

<http://www.iitk.ac.in/doaaold/thesisguide.pdf>

http://www.qu.edu.qa/static_file/qu/research/documents/office-of-graduate-studies-master-project-templateMarch2016-en.pdf

NUTRITION AND PHYSICAL FITNESS

SEMESTER : III

THEORY – 4 Hrs /Week

ELECTIVE: IV

COURSE OBJECTIVES:

Enable students

1. To understand the role of nutrition in maintaining fitness
2. To realize the importance of physical activity in maintaining health
3. To adopt stress coping alternatives technologies towards positive health
4. To learn importance of good nutrition for athletes
5. To learn about ergogenic aids

COURSE OUTLINE:

UNIT I

Importance of health, fitness and wellness. Energy and performance-definition, role of ATP and its inter conversion, storage of carbohydrate and protein in the body, important fuels for exercise, role of creatine, lactic acid and fatigue, anaerobic glycolysis.

UNIT II

Fitness-definition, benefits, components, conditioning by training, aerobic and anaerobic activities.

UNIT III

Gym and fitness-Major fitness equipment and their importance in maintaining desirable body composition and ideal body weight. Workplace fitness-effective strategies for increasing physical activity and healthy eating in the work place.

UNIT IV

Stress related problems and coping technologies-Yoga, meditation and relaxation techniques.

UNIT V

Nutritional requirements of athletes –Fluid, vitamins and minerals. Ergogenic aids. Problems of athletes-dehydration, eating disorders, amenorrhea, iron deficiency anaemia and sports anemia.

RELATED EXPERIENCE

Study the dietary intake of athletes
Observe the performance of athletes.
Diet counselling to QMGC (W) sports students.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understood the prevention and management of lifestyle related disorders
CO2	Understood the technical aspects to run fitness centres
CO3	Gained knowledge about nutrition supplement
CO4	Gained knowledge on important fuels for exercise
CO5	Developed knowledge on nutritional requirements of athletes.

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

RECOMMENDED TEXT BOOKS

- B.Srilakshmi Exercise Physiology fitness and Sports Nutrition ,First Edition, New age international publishers.

REFERENCES

- 1.Anita Bean, The complete guide to sports nutrition, A&C Black publishers, 2000
- 2.L.K.Mahan, S.E.Stump and J.L.Raymond (2012). 'Krauses's Food and nutrition care process, Elsevier Saunders company, USA
- 3.Robinson, C.H.M.R.Lawrie, Chenoweth and A.E.Garwick; Normal and Therapeutic nutrition, 17th ed .Macmillan pub.co.
- 4.Williams S.R (1985): Essentials of nutrition and diet therapy, 5th, Mosby college pub.st.louis
- 5.G.M.Wardlaw, P.M.Insel and M.F.Seyler (1994) Contemporary Nutrition Issues, insights, 2nd edn, Mosby publishers, London

- 6.R.Passmore and M.A.Eastwood (1986) Human Nutrition and dietetics, 8th edn.ELBS publishers, Edinburgh.
- 7.Shils-M.E (2006) Modern Nutrition in health and disease, 10th edn,Lippincott Williams Williams,Sydney

JOURNALS:

- International Journal of Behavioural Nutrition and Physical Activity
- Indian Journal of applied Research

E LEARNING RESOURCES:

- <https://medlineplus.gov/exerciseandphysicalfitness>
- [https://my.clevelandclinic.org/aerobic exercise](https://my.clevelandclinic.org/aerobic-exercise)
- <https://fitforwork.org> healthy eating in the work place
- <https://www.ncbi.nlm.nih.gov> - coping technologies
[http://www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov/pmc)>pmc-nutritional requirement of athletics

HOSPITAL MANAGEMENT

SEMESTER : III

THEORY: 4 Hrs/Week

EXTRA DISCIPLINARY ELECTIVE: II

COURSE OBJECTIVES:

Enable Students

1. Learn about the types of hospital and their administration
2. To be aware of the legal aspects of hospital administration.
3. Know about National and International organizations financing medical care.
4. Understand the organization structure of hospital.
5. Gain knowledge on resource management in hospitals.

COURSE OUTLINE:

UNIT I

Hospital Management – Introduction, general principles, History and functions of Hospital, types of hospital, management – structure and duties, Relationship of Hospital to the community.

UNIT-II

Legal Aspects of Hospital Management – Duties and responsibilities of nurses, doctors, dietitians and employees in the hospital, Medical malpractices, Laws applying to hospital.

UNIT III

Organisation Financing Medical Care National – ICMR, NIN, CFTRI International _WHO, UNICEF, FAO

UNIT IV

Budget-Types of Budget, steps in planning a budget, Book Keeping, transactions, rules for single and double entry, books of account – ledger journal, trial balance, balance sheet.

UNIT V

Total Quality Management – Definition of Quality, meaning of Total Quality Management, Total Quality Management process, Difference between ISO 9000 and Total Quality Management.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understood the best practices in hospital management and relationship of hospital to community development

CO2	Equipped to lead role in implementing reforms in the hospital sector.
CO3	Developed awareness of the legal aspects of hospital administration
CO4	Familiarised with National and International organizations financing medical care
CO5	Understood and apply resource management concepts and the process and strategies needed in specific hospital sector

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	2	3
CO3	3	3	2	3	3
CO4	3	3	3	2	3
CO5	3	3	3	2	3
Average					

RECOMMENDED TEXT BOOKS

- Hospital management volume3, Manisha saxena first Edition (2018) , CBS publishers &Distributors.
- Robinson et.al. 1986, normal and Therapeutic Nutrition. MacMillan Co., New York

REFERENCES:

- 1.Davidson S.R and Passmore J.F., 1975, Human Nutrition and Dietetics. Vol I II Edition
- 2.Francis, C.M and D' Souza, M.C., 2000, hospital Administration. Jay Brothers
- 3.Gillespie S.Mc.Neil G., 1992, hospital Management Macmillan and Co., New York.
- 4.Mitchell et al., 1987, Nutrition in Health & disease, Pitman M.Edu. publishing Co.,
- 5.Robinson et.al. 1986, normal and Therapeutic Nutrition. MacMillan Co., New York.

JOURNALS:

- International Journal of Research Foundation of Hospital Health Care
- Journal of Hospital and Health Care Administration

E LEARNING RESOURCES:

- www.who.int -management of hospital
- www.djo.org.in-legal aspects of hospital management
- <https://www.ncbi.nlm.nih.gov> -organisation financing medical care national
- www.commonwealthfund.org -budget of hospital govt link

- <https://www.ncbi.nlm.nih.gov> -total quality management

DISSERTATION

SEMESTER: IV

HOURS:12

CORE: XII

COURSE OBJECTIVES:

Enable students

1. To find out the nutritional problems in the society and indentify ways to solve them.
2. To design and formulate the research study
3. Enable the students to find out thrust areas and carryout research on that.
4. Help the students to collect and analyze the data
5. Gain knowledge in conducting surveys.

CO Number	CO STATEMENTS
CO 1	Equipped students with knowledge to develop innovative products
CO2	Found solution for the research problems related to Home Science
CO3	Enabled to undertake surveys on diet and disease relationships
CO4	Ability to collect and critically evaluate the relevant literature
CO5	Recognized the importance of planning and preparation required to undertake a research project

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

RECOMMENDED TEXT BOOKS

Students will work individually under the guidance of staff members on topics of their interest in thrust areas in Home Science.

JOURNALS:

- IJAR
- IJMR
- International Journal of Thesis, Projects and Dissertation

E LEARNING RESOURCES:

- Google scholar
- Pubmed
- Shodhganga

THERAPEUTIC NUTRITION AND DIET PRACTICALS

SEMESTER : IV

THEORY- 6

Hrs/Week

CORE : XIII

COURSE OBJECTIVES:

Enable students to

1. Understand the concept of therapeutic nutrition and diet
2. Learn to formulate diets and feeding techniques
3. Update knowledge on advanced techniques and concept of diet planning and diet counseling

4. Prepare diets and calculate nutrient composition for dietary intervention
5. Critically evaluate the adequacy of therapeutic diets

COURSE OUTLINE:

1. Calculation of selected nutrients for diseases based on modified recommended dietary allowances.
2. Planning, preparation and service of diets for :
 - a. Peptic ulcer
 - b. Viral hepatitis
 - c. Cirrhosis of liver
 - d. Irritable bowel syndrome
 - e. Obesity
 - f. Diabetes mellitus
 - g. Hypertension
 - h. Atherosclerosis
 - i. Nephritis
 - j. Nephrosis
 - k. Kidney stones
 - l. Colon cancer

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Comprehended the principles of diet for diseases
CO2	Acquired skills in planning diets
CO3	Formulated special feeds
CO4	Addressed the nutritional needs for critical care
CO5	Critically evaluated the nutritional adequacy of diets

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

RECOMMENDED TEXT BOOKS

- L.kathleen Mahan, MS,RD,CDE, Sylvia Escoot-stump MA,RD,CDN, Krause's food nutrition and diet therapy, 11th Edition (2004), Printed in the united states of America
- Dietetics, B. Srilakshmi, 7th Edition (2014), New age international (p) Limited, Publishers.

REFERENCES

1. Antia, F.B., 1973 Clinical Nutrition and Dietetics. London, Oxford University Press.
2. Davidson, S and Passmore, R., 1977, Human Nutrition and Dietetics,London,ELBS.
3. Gopalan, C and Balasubramanian, S.C . and Ramasastry, B.V., 1981, The Nutritive value of Indian Foods,New Delhi, ICMR.
4. Joshi.s., 2002, Nutrition and Dietetics, New Delhi, Tata McGraw Hill Publishing Co.
5. Robinson,C.H., 1977, Normal and Therapeutic Nutrition. The Oxford and IBM Publishing Co.
6. Sri Lakshmi.B., 2004, Dietetics. Chennai, New Age International Pub Co.
7. Williams.S.R., 1986, Essentials of Nutrition and Diet Therapy. Toronto, Times Mirror/Mosby College Publishing

JOURNALS:

- Journal of Nutritional Medicine and Diet Care
- International Journal of Clinical Nutrition and dietetics

E LEARNING RESOURCES:

- <http://www.adaevidencelibrary.com/topic.cfm>
- <https://liverfoundation.org>nutrition>
- www.kidney.org
- <http://www.nlm.nih.gov/medlineplus/metabolicdisorders>
- <http://www.heart.org>
- <http://www.nlm.nih.gov/medlineplus/metabolicdisorders>

FOOD SERVICE MANAGEMENT

SEMESTER-IV

THEORY-6 Hrs/ Week

CORE-XIV

COURSE OBJECTIVES:

Enable students

1. To understand the important aspects of management
2. Develop appropriate managerial skills required to operate a food service unit
3. Learn about the concepts in financial management
4. Understand the aspects of human resource management
5. Promote entrepreneurship skills

COURSE OUTLINE:

UNIT-I

Principles and tools of management –An overview of the principles of management , management of resources- the m's, functions and tools of management. Leadership styles.

UNIT-II

Human resource management- recruitment and selection, induction, training, supervision, promotion, transfer, termination and dismissal of employees. laws governing food service units-food and labour laws, . Welfare measures, Maslow's theories, motivational factors- incentive, bonus and fringe benefits.

UNIT-III

Financial management- definition of costs, elements and behaviour of cost, factors affecting cost control, methods of pricing, gross profit ratio, net profit ratio, break even analysis. Book keeping, transactions, rules for single and double entry, books of account- ledger journal, trial balance, balance sheet.

UNIT-IV

Marketing Management- LEARNING OUTCOMES, functions, marketing mix- definition, components,- the 4 P's , steps in product planning, Product promotion- definition, LEARNING OUTCOMES, components, Advertising- meaning, LEARNING OUTCOMES, types

UNIT-V

Sanitation and safety. Environmental sanitation and safety- causes and prevention of accidents, insects and pest control, garbage disposal.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Developed potential skill in planning, production and service of food
CO2	Initiated entrepreneurship ventures
CO3	Developed various managerial skills required to operate a food service unit for effective work environment
CO4	Analyzed and implement quality control in food service institution
CO5	Promoted products in the market

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	2	3
CO5	3	3	3	3	3
Average					

RECOMMENDED TEXT BOOKS

- Sethi and Malhan, “Catering Management” Wiley Eastern Limited, 1987

REFERENCES:

1. West.B. Wood Food Service in Institutions, New York, 1995.
2. Sethi and Malhan, “Catering Management” Wiley Eastern Limited, 1987.
3. Kotschewar.L.and Tenal, M.e, “Food Service Planning Layout and Equipment, John Wiley and sons limited, 1961.
4. Lillycrap, D.R and Cousins. J.A, “Food and Beverage Service”
5. Sudhir Andrews, Textbook of Food and Beverage Management.

JOURNALS:

- The Journal of food Service Management and Education
- International Journal of Contemporary Hospitality Management

E LEARNING RESOURCES:

- <http://www.egyankosh.ac.in/bitstream/123456789/33546/1/Unit-3.pdf>
- <http://ncert.nic.in/textbook/pdf/lehe104.pdf>
- <https://pdfs.semanticscholar.org/6651/55d6d884b0ca81e936ccdccd681cfc2bce46.pdf>
- <https://www.ijac.org.uk/images/frontImages/gallery/Vol. 3 No. 9/12. 159-167.pdf>
- https://icmai.in/upload/Students/Syllabus-2012/Study_Material_New/Inter-Paper8-Revised.pdf

TRENDS IN FOOD CONSUMPTION

SEMESTER: IV

THEORY -4 Hrs/ Week

ELECTIVE : V

COURSE OBJECTIVES:

1. Become aware of the impact of nutrition transition
2. Understand the changing patterns of food consumption
3. Be aware of the value of medicinal plants.
4. Realize the need for Functional foods and antioxidant
5. Correlate the role of nutraceuticals with disease prevention

COURSE OUTLINE:

UNIT – I

Nutrition Transition- Relation to Economic development – Changes in Food Consumption Pattern Life style changes-Effect on health

UNIT – II

Traditional diets: Characteristics of traditional diets – Health benefits of Palaeolithic & Mediterranean diets

From Traditional to Modern Diets- Myths and truths about Nutrition.

UNIT III

Medicinal Herbs and their uses – Tulasi, Omavalli., Mint, Thoothuvalai, kizhanelli, ginger garlic, cinnamon, neem, mustard, Coriander and Turmeric

UNIT IV

Functional Foods – Nutraceuticals – Types and uses

Organic Foods – Origin, Definition – Comparison of organically and conventionally grown foods. Health benefits of organic foods.

UNIT – V

Antioxidants in foods- Sources of free radicals and reactive oxygen species- Disease produced by free radicals. Markers of Oxidative Stress- Antioxidant defence system- Combating free radicals and reactive oxygen.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understood the trends and dimensions in food consumption pattern
CO2	Became aware of the health benefits of nutraceuticals
CO3	Related to new frontiers in nutrition functional foods and antioxidant
CO4	Able to make healthy food choices
CO5	Apply acquired knowledge in personal hygiene, food handling and environmental safety

MAPPING PSO WITH CO

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	3
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	2	3
CO5	3	3	3	3	3
Average	3	3	3	3	3

RECOMMENDED TEXT BOOKS

- Sri Lakshmi B. Food Science New Age International Publishers, New Delhi 2003
- Barnji Mehtab, S.et.al Text Book of Human Nutrition, Oxford & IBH Publishing Company, Pvt Ltd New Delhi 2002.

REFERENCE BOOKS:

1. 2.Shils, M.E., James A., Olson Moshe Shike, Modern Nutrition in Health and Disease Lea and Febzler, Philadelphia 1996.
2. 3.Sri Lakshmi B. Nutrition Science. 3rd ed New Age International (P) Ltd., Publishers, New Delhi 2009.
3. 4.Pathak, Y.V.2010 Ed Handbook of Nutraceuticals. Vol I Ingredients, Formulations and Applications CRC Press. 2010.
4. 5.Manay, S &Shadakshraswami M., Food Facts and Principles, New Age International Publishers, New Delhi 1997.
5. 6.Bennion, M., Introductory foods, 7th Mac Millam Publishinng Co., U.S.A 1980.
6. 8.Potter, N.M. Foods The AVI Publishing Co., Connectic

JOURNALS:

- International Trend in Food Consumption
- Journal of Rural Development

E LEARNING RESOURCES:

- <https://www.ncbi.nlm.nih.gov-> nutrition transition
- <https://oldwaysspt.org-> traditional diets
- <https://www.nhp.gov.in-> medicinal herbs
- <https://foodfacts.org.2a/nutraceuticals-> functional-foods/
- <https://www.ompj.org-> antioxidant defence system

DEPARTMENT OF HOME SCIENCE

Undergraduate Courses

Choice Based Credit System

Quaid- E – Millath Government College for Women (Autonomous) offers the Semester System of Education with credits for UG courses. Credit simply means the weightage given to what is taught and what is learnt. It is normally related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures/tutorials/laboratory work/ seminar/project work/practical training/ viva voce etc too facilitate effective teaching and learning and the credits are assigned accordingly, depending on the content and the specialization.

The minimum credit requirement for a three-year UG course shall be 140.

REGULATIONS

1. Duration
 - a) There will be two semesters in each academic year. The first academic year shall comprise of the first and second semesters, the second academic year, the third and fourth semesters and the third academic year, the fifth and sixth semesters.
 - b) The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year.
2. Course of Study
 - a. The course of study for Bachelor Degree courses shall comprise of the following

Part I & II – Foundation Courses:

- I. Part – I Tamil
- II. Part – II English

Part III:

- a. Core subjects
- b. Allied Subjects

PART IV

- a. Soft Skill (4 Papers)
- b. Non –Major Elective (2 Papers)
- c. Environmental Studies

d. Value Education

Compulsory Core Module Course in Environmental Studies consisting of 2 extra credits, Value Education -2 Credits, Soft skills – 8 Credits (2 Credits each) Non-Major electives – 4 credits (2 credits each)

PART V

Compulsory Extension Service. All students shall have to enrol for NSS/NCC/YRC/RRC/Sports And Games/Consumer club / Enviro club or any other service organization in the College and shall have to put in compulsory attendance of 40 hours, which shall be duly certified. If a student lacks 40 hours attendance in the First year, she shall have to compensate the same during the subsequent years.

Students who complete the minimum attendance of 40 hours in One Year only will get credit and those who complete the attendance of 80 or more hours in Two years will get I credit.

**PATTERN OF QUESTION PAPER
CORE PAPER AND ALLED
(THEORY)**

SECTION		Max Marks:75
	PART –A	
Short Answers	(Answer all Questions)	(10X2=20)
	PART _ B	
Paragraph Answers	(5 out of 8)	(5X5=25)
	PART _ C	
Essay	(3 out of 5)	(3X10=30)

**CORE PAPER AND ALLIED
(PRACTICAL)**

Practical	Max Marks: 75

SYLLABUS DETAILS

ALONG WITH FRAMEWORK, CREDITS OFFERED

For candidates admitted from 2017 -2018

B.Sc Home Science-Nutrition Food Service Management and Dietetics

SE M	COMPONENT	CODE	TITLE	LECTURE HRS	CA	SE	TOTAL	CR

I	Language	173301	Tamil Paper-I		6	25	75	100	3
		173801	English paper –I		4	25	75	100	3
	Core	172601	Microbiology		6	25	75	100	5
		172602	Food Science and Basic Cookery		6	25	75	100	5
	Allied	172391	Chemistry-I		6	25	75	100	5
	NME		Non-Major Electives (Arts Department)		2	40	60	100	2
	Soft Skill – I	179001	Essentials of Language and communication		2	40	60	100	3
II	Language	173302	Tamil Paper-II		6	25	75	100	3
		173802	English paper –II		4	25	75	100	3
	Core	172603	Human Physiology		6	25	75	100	4
		172604	Food Science and Basic Cookery Practical		6	25	75	100	4
	Allied	172392	Chemistry-II	Theory	3	25	75	100	3
				Practical	3	25	75	100	2
	NME		Non-Major Electives (Arts Department)		2	40	60	100	2
	Soft Skill – II	179002	Essentials of spoken and Presentation skills		2	40	60	100	3
III	Language	173303	Tamil Paper-III		6	25	75	100	3
		173803	English paper –III		4	25	75	100	3
	Core	172605	Bio Chemistry		6	25	75	100	4
		172606	Quantity Food Production and Food Service		6	25	75	100	4
	Allied	172393	Food preservation		6	25	75	100	5
	Soft Skill – III	179003	Personality Enrichment		2	40	60	100	3
	E VS	174001	Environmental Studies		2	-	-	-	
IV	Language	173304	Tamil Paper-III		6	25	75	100	3
		173805	English paper –III		4	25	75	100	3
	Core	172607	Nutrition Through Life Cycle		6	25	75	100	4
		172608	Human Nutrition-I		6	25	75	100	4
	Allied	173312	Interior Decoration		6	25	75	100	5
	Soft Skill – IV	179004	Basic Computer Skills and Applications		2	40	60	100	3
	E VS	174001	Environmental Studies		2	40	60	100	2
	Ext	174002	Extension Activities		-	-	-	-	1
V	Core	173309	Food Service Management		6	25	75	100	4
		173310	Human Development		6	25	75	100	4
		173311	Human Nutrition-II		6	25	75	100	4
		173314	Dietetics		6	25	75	100	4
	Elective	173313	Principles of Resource Management		5	25	72	100	5
	VE	174003	Value Education		1	-	-	-	-

VI	Core	142394	Community Nutrition	6	25	75	100	4
		143315	Human Nutrition Practical	6	25	75	100	5
		143316	Dietetics Practical	6	25	75	100	4
	Elective	143317	Consumer Education	6	25	75	100	5
		143318	Entrepreneurship Development	5	25	72	100	5
	VE	144003	Value Education	1	40	60	100	2

B SC- SPECIFIC OUTCOMES

6. Develop basic skills for perusing higher education/careers in the field of microbiology, nutrition, dietetics, interior decoration, fitness and preschool education in government and non-government organisations
7. Sensitized towards existing nutritional challenges and develop strategies to overcome them for holistic living
8. Adopt effective mobilization and utilization of resources for sustainable development and address nutritional concern with the focus on national development
9. Develop employability skills for avenues in food hospitality, health sector, marketing and finance
10. Apply critical thinking and analytical evaluation to contemporary knowledge in Home Science

SYLLABUS MICROBIOLOGY

SEMESTER I /PAPER – I
Subject Code: 172601

Hours: 75 hrs
Credits: 5

COURSE OBJECTIVES :

- To gain knowledge about the microbes in the environment and ways of controlling them.
- To understand that personal health is dependent on clean air, water, food and surroundings.

- To learn about ways of controlling and preventing infection.

COURSE OUTLINE:

Unit – I

General Characteristics of Bacteria, Virus, Yeasts and Moulds – Morphology, Classification, Motility, Nutrition, Respiration and Reproduction.

Unit – II

Environmental Microbiology-

- a) Soil Microbiology- Nitrogen Fixation and Nitrogen cycle
- b) Air – Common microorganism in air & methods of air purification –dust control, UV radiation and laminar air flow.
- c) Water – micro organisms in water – tests for sanitary quality of water – purification of water-UV, Reverse Osmosis

Unit – III

Microorganisms in health and disease – Infection – sources, methods of transmission, Immunity Schedule.

Common infectious diseases: Bacterial – Cholera, Typhoid, Tuberculosis

Viral – Hepatitis-A & B, Dengue, Swine Flu, Measles,

Food Poisoning-Causes, Types and Prevention

Unit – IV

The Immune System- Immune response, Hypersensitivity-Allergic response, Antigen-Antibody reaction - Agglutination test, ELISA

Unit – V

Destruction of micro organisms – Sterilization and Disinfection, Physical and Chemical methods.

Practical:

- Use and care of microscope
- Identification of Bacteria, Moulds, Yeasts and Algae
- Preparation of hanging drop
- Simple staining
- Identification of micro organisms from soil, water and food.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understand the structure of various microorganisms and their functions.

CO2	Acquire knowledge about the spread of disease and means of controlling it.
CO3	Practical application of water purification methods at home for effective resource utilization.
CO4	Gain knowledge on environmental safety and sanitation.
CO5	Enable to understand the human immune system.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	3
CO2	2	3	2	2	3
CO3	2	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Average	2.8	2.8	2.4	2.4	3

RECOMMENDED TEXTBOOKS:

- Park, J.E., and Park, K – 1989 – Text Book of Preventive and Social Medicine – 12th Edition, Banarsidar Bharol, 1167 Prem Nagar.
- Yash Pal Bedi – 1988, 15th Edition – A Handbook of Social and Preventive Medicine, Atma Ram & Sons, Delhi

REFERENCES BOOKS:

- Pelczar, M.J., and Raid R.D. and Chan – 1972 – Microbiology – McGraw Hill Publishing Co.,
- Burdon, K.L., and Williams R.P. – 1968 – Microbiology – 6th Edition – The Macmillan Co., London.
- Joshua, A.K. 1988, Microbiology – Popular Book Depot, Saidapet, Chennai – 15.

JOURNALS:

- International Journal of Medical Microbiology
- Microbiological Research

E-LEARNING RESOURCES:

- https://www.researchgate.net/publication/315803754_MORPHOLOGY_AND_CLASSIFICATION_OF_BACTERIA

- https://www.researchgate.net/publication/241028913_Microorganisms_in_Soil_Water_and_Air
- https://www.researchgate.net/publication/321957191_Food_Poisoning_Caused_by_Bacteria_Food_Toxins/link/5a3b59960f7e9bbef9feb168/download
- https://www.researchgate.net/publication/14774280_Antigen-Antibody_Reactions
- https://www.researchgate.net/publication/315804456_STERILISATION_AND_DISINFECTION

FOOD SCIENCE AND BASIC COOKERY

SEMESTER I/Paper – II

Hours: 75 hrs

Subject Code: 172602

Credits: 5

COURSE OBJECTIVES:

To enable students to

- Obtain knowledge of different food groups and their nutritive value.
- Understand the principles underlying Food Preparation.
- Develop skill and techniques in Food Preparation with conservation of nutrients and palatability using cooking methods generally employed.

COURSE OUTLINE:

Unit – I

Methods of Cooking – Moist and Dry heat. methods of cooking- Cereals, Pulses, Vegetables and fruits, Milk and Milk products, Fleshy and sea foods

Unit – II

Cereals – Composition, Nutritive value , Gelatinization and Dextrinization.

Pulses – Nutritive value, cooking, dhals and other legumes – Sprouting, Toxic constituents in Pulses.

Unit – III

Vegetables and Fruits – Classification of fruits and Vegetables, Composition and nutritive value of some common vegetables and fruits. Enzymatic Browning, changes during cooking.

Unit – IV

Flesh Foods – Meat- Nutritive value, Fish – Selection and Classification, Nutritive value, Eggs – Structure and composition, Nutritive value, Uses in cookery.

Milk and Milk Products – Nutritive Value, Coagulation of milk, Milk products, whole and skimmed milk, ghee, butter and cheese.

Unit – V

Fats and Oil – Source, Hydrogenation, Rancidity, Smoking point, Emulsification uses in cookery.

Sugar Cookery – Stages in Sugar cookery, Crystallisation in Sugar cookery, Jaggery.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Equipped to understand the scientific aspects of food preparation.
CO2	Understand the nutritional importance of foods
CO3	Gain knowledge on minimizing cooking losses of nutrients through proper cooking method for optimal health.
CO4	Understand the effects of processing parameters on product quality.
CO5	Gain sufficient knowledge of food chemistry to control reactions in food.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3
CO2	3	3	3	3	3
CO3	2	3	2	1	3
CO4	2	3	3	3	3
CO5	3	3	2	2	3
Average	2.6	3	2.4	2.4	3

RECOMMENDED TEXTBOOKS:

- Manay, Shakunthala, D. And Shadaksharaswamy Y.M., 2001: Food Facts and Principles, 2nd Edition, New Age International Ltd., Publishers, New Delhi
- Thangam E. Philip, 200e: Modern cookery for Teaching and the Trade, vol. 1, 5th Edition, Orient Longmans Pvt., Ltd., New Delhi.

REFERENCES BOOKS:

- Brich, C.G. Spencer, M. And Cameron, A.G., 1977: Food Science, 2nd edition, Perfmon Press, New York.
- Fox B.A. and Cameron, A.G., 1997 Food science – Nutrition and Health, 6th Edition, Hoddon and Stoughton, G.B.,
- Gopalan, C. Ramasastri, P.N. and Balasubramanian, S.C., 2002: Nutritive value of Indian Foods: NIN, Hyderabad.
- Margret Mc Williams, 1993: Food Experimental Perspectives, Mac Millan Inc.
- Mudambi, S.R. and Rao, S.M. 1986: Food Science, Delmar Thomson Learning. Inc. Printed in the USA.

JOURNALS:

- Journal of Food Science
- International Journal of Food Science and Nutrition

E-LEARNING RESOURCES:

- www.nal.vsda.gov/fnic/foodcomp
- www.fda.gov-vegetables
- www.eatright.org/cgi/search.cgi
- <http://www.eatforhealth.gov.au-fleshfoods,egg&milk>
- <https://www.business.qld.gov.au-sensory> analysis of food products

HUMAN PHYSIOLOGY

Semester – II /Paper III

HOURS: 60 hours

SUBJECT CODE: 172603

CREDITS: 4

COURSE OBJECTIVES:

- To enable students to understand the structure and functions of various systems in our body.
- To enable student to understand the function of different organs and system in the human body.
- To understand the physiological basis of diseases

COURSE OUTLINE:

Unit I

Cardiovascular system: Blood – Composition, functions.

Haemopoiesis – RBC, Structure ,function, normal count, haemoglobin functions, WBC – Structure, function, normal count, coagulation of blood, anticoagulants, blood grouping.

Heart and Circulation: Structure of the Heart , properties of cardiac muscle, cardiac cycle, cardiac output, ECG heart sound s, blood Pressure – definition, measurement of Bp and factors affecting it.

Unit II

Respiratory System: Structure and functions of respiratory system. Mechanism of respiration, transport of gases, lung volume and capacities.

Unit III

Digestive System: Structure and functions of digestive system

Unit IV

Excretory System: Structure and functions of nephron, Urine formation, micturition.

Unit V

Endocrine system: Pituitary, thyroid, Parathyroid, adrenal glands, Islets of langerhans and pancreas – functions and disorders.

Reproductive system: Structure of male and female reproductive organs, functions of the ovarian hormones and testicular hormones, menstrual cycle.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understand the role of nutrients in growth and maintenance for holistic health.
CO2	Understand the normal functioning of all the organ systems of the body and their Inter actions.
CO3	Learn about pathogenesis of commonly occurring diseases.
CO4	Understand the mechanism of various metabolic processes in disease condition.
CO5	Understand the functions of various physiological systems.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	3	3
CO2	1	3	2	2	2
CO3	3	3	3	3	3
CO4	2	3	1	2	3
CO5	3	3	3	3	3
AVERAGE	2.4	3	2.4	2.6	2.8

RECOMMENDED TEXTBOOKS:

- Chandrani Sanyal Datta, Essential of Human Physiology. Alt. B.S. Publishers and Distributors (Regd) 2006.
- Chatterjee C.C. Human Physiology, Vol. I & II.

REFERENCES BOOKS:

- Best and Taylor's – Physiological Basis of Medical Practice, 1990, edited by West J.B. 12th Edition Williams and Williams, Baltimore, San Francisco, London.
- Dr. N.M.Muthayya, Essentials of Physiology, Vol. I 8.II, Emerald publishers, Anna salai, Chennai – 2 1991.
- Gerard J. Tortora Introduction to The Human Body, 4ft edition, Addison Wesley Longman, 1997.
- Guyton A.C Functions of the Human Boody WB Saunder Co., Philadelphia 1969
- Rita Jansi, Neerai Dhingra, Meenu Dhingra – Quick Review in Anatomy and physiology PEE PEE, 2007.

JOURNALS:

- The Journal of Physiology
- International Journal of Clinical and Experimental Physiology

E-LEARNING RESOURCES:

- <https://www.betterhealth.vic.gov.au/health/conditionsandtreatment/respiratory-system- respiratory system>
- <https://www.ncbi.nlm.nih.gov/pmc- excretory system>
- <https://www.cancerindex.org- cardiovascular system>
- www.americanheart.org- cardiovascular system
- <https://medlineplus.gov/ endocrine system.html- endocrine system>

FOOD SCIENCE AND BASIC COOKERY PRACTICAL

SEMESTER –II/ Paper – IV

Hours: 90 Hours

Subject Code: 172604

Credits: 4

COURSE OBJECTIVES:

- To understand the measuring techniques.
- To understand the changes during cookery.
- To enable ways to prevent nutrient losses during cookery.

COURSE OUTLINE:

Unit – I

Survey of locally available foods – Nutritive value of 100 gms of food from the Basic Five food groups.

Measurement Techniques – Edible and Non- edible.

Cereal cookery – Different methods of cooking rice – straining method, Absorption method, pressure cooking and Microwave cooking. Method of mixing. Powdered cereal, granular cereal – Semolina, fine cereal, maida or ragi flour. Related recipes.

Pulses Pulse cookery – factors affecting cooking quality of pulses, Hard water and soft water cooking. Effect of papaya and soaking on texture and cooking time using whole Green gram and Green gram dhal. Related recipes.

Unit – II

Vegetables – Vegetable cookery – Effect of shredding, dicing, acid, alkali, covering, steaming and pressure cooking on vegetables using greens, carrot, beet root and red cabbage.

Fruits – Demonstration of browning reaction and methods of preventing browning in fruits. Related recipes.

Unit – III

Eggs – Factors affecting boiling, whipping and poaching of eggs- demonstration.

Milk and milk products Preparation – cream of Tomato Soup, White sauce, vanilla ice cream, Banana milk shake, Vermicelli payasam Sponge cake and Biscuits – Demonstration. Related recipes.

Unit – IV

Fried Foods – Demonstration – Smoking point, Bread cube test, Frying chips at different temperatures. Related recipes.

Unit – V

Sugar Cookery – Demonstration of stages of Sugar Cookery. Related recipes.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Apply the scientific principles in food preparation.
CO2	Understand the desirable and undesirable changes taken place during cooking of foods
CO3	Minimize loss of nutrients during food preparation
CO4	Analyze and apply the food science operations.
CO5	Calculate and interpret nutrient composition of foods.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

O/PSO	PSO1	PSO2	PS03	PSO4	PSO5
CO1	3	3	3	3	3
CO2	2	2	2	2	2
CO3	3	3	2	3	3
CO4	3	3	3	3	3
CO4	3	2	3	2	2
AVERAGE	2.8	2.8	2.8	2.8	2.8

RECOMMENDED TEXTBOOKS:

- Thangam E. Philip, 2003: Modern cookery for Teaching and the Trade, Vol. 1, 5th Edition, Orient LONGMANS Pvt, Ltd. New Delhi.
- Gopala, C. Ramasastry, P.N. and Balasubramanian, S.C., 2002: Nutritive value of Indian Foods : NIN, Hyderabad

REFERENCE BOOKS:

- Bennion, M and Hughes, D., 1975: Introductory foods, Mac Millan publishing Co., Inc. New York.

- Fox B.A., and Cameron A.G., 1997 Food Science – Nutrition and Health, 6th Edition, Hodden and Stoughton, G.B.
- Margret MC Williams, 19993: Food Experimental perspectives, Mac Millan Incc.
- Potter, N .Norman, Hotchkiss P. Joseph, 1997: Food Science, 5th Edition, CBS Publishers and Distributors, New Delhi.

JOURNALS:

- Journal of Food Science
- International Journal of Food Science and Nutrition

E-LEARNING RESOURCES:

- www.ncbi.nlm.nih.gov- moist and dry heat cooking
- www.nal.usda.gov/fnic/ food composition of cereals
- [https://www.cdc.gov/healthy eating /](https://www.cdc.gov/healthy eating/) fruits & vegetables
- <http://www.eatforhealth.gov.au>- flesh foods
- <https://www.choosemyplate.gov>- fats &oils

BIO CHEMISTRY

SEMESTER III/Paper V

Hours:60 hours

Subject Code:172605

Credits: 4

COURSC OBJECTIVES:

To introduce students to

- Principles of Biochemistry
- Understand the functions of Biological systems in relation to Biochemistry.
- To learn about various metabolic pathology.

COURSE OUTLINE:

UNIT I

Carbohydrate – structure, general reactions of mono, di, tri and oligo saccharides. Metabolism – glycolysis, TCA Cycle, Hexose Monophosphate Shunt, Gluconeogenesis.

UNIT II

Amino acids – Classification and structure.

Proteins – Primary, secondary, Tertiary structure – Hydrolysis of proteins – denaturation, precipitation, coagulation.

Metabolism of proteins – Deamination, Transamination, Decarboxylation – Urea Cycle

UNIT III

Fatty Acids – Role of Saturated fatty acids, EFA, Beta oxidation of fatty acids, Bio synthesis of fatty acids - Palmitic acids, Ketogenesis, Cholesterol – biosynthesis.

UNIT IV

Enzymes – Classification, factors affecting enzyme activity, mechanism of enzyme action , Coenzyme and prosthetic group.

UNIT V

Acid – Base Balance: Definitions, Henderson Hasselbalch Equation, Buffer Systems of blood- Haemoglobin Buffer System, Chloride Shift, Respiratory Mechanism Renal Mechanism,

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Gained knowledge on various metabolic pathways of proximal nutrients.
CO2	Understand the mechanism of enzyme action.
CO3	To understand the fundamentals of biochemical principles and processes.
CO4	Develop the basic knowledge on fundamental concepts of chemistry and biology.
CO5	Critically analyze and apply the knowledge on both chemistry and biology in solving complex problems involving living system.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3
CO2	2	2	2	2	2
CO3	3	3	3	3	3
CO4	3	3	3	3	2
CO5	3	3	3	3	3
AVERAGE	2.8	2.8	2.6	2.8	2.6

RECOMMENDED TEXTBOOKS:

- Shanmugam Ambika – Fundamental of Biochemistry of Medical Students, NV A Bharat Printers, and Traders 56, Peters Road, Madras – 86, 1985.
- Damodaran M, Vasudevan and S.Sreekumari - Textbook of biochemistry for medical students

REFERENCE TEXTBOOKS:

- Conn EE Stump P.K. Outlines of Biochemistry – Wiley eastern (P) Ltd.,
- West E.S.Todd W.R.Mosses R.S. and Van Bruggan J.S. Text Book of Biochemistry, The Macmillan Co., New York, 1968.

- Mazar A and Harrow B, Biochemistry, A Laboratory Manual, John Wiley Sons Inc, New York, 1969.
- Donald Voet, Judith.G.Voet, Charlotte W Pratt, 2013, Principles of Biochemistry, John Wiley and sons, Singapore Pvt. Ltd.

JOURNAL:

- Journal of Biological Chemistry
- The International Journal of Biochemistry

E-LEARNING RESOURCES:

- <https://www.ncbi.nlm.nih.gov-carbohydratemetabolism>
- <http://medlineplus.gov-aminoacids>
- <http://www.ncbi.nlm.nih.gov-fattyacids>
- <https://www.rsc.org-enzymes>
- <http://www.ncbi.nlm.nih.gov-acidbasebalance>

QUANTITY FOOD PRODUCTION AND FOOD SERVICE

SEMESTER III /Paper – VI

Subject Code:172606

Hours: 75

Credits: 4

COURSE OBJECTIVES:

To enable students to

- Understand basis principles of bulk production of food
- Gain knowledge regarding selection & Purchase of food.
- Develop skills in menu planning.
- Understand the different styles of service.

COURSE OUTLINE:

UNIT I

- Food Production systems: Conventional, Commissary, Assembly Serve, Ready prepared.

UNIT II

Equipment in Food Service: Classification, factors for selection of equipment .

UNIT III

Quantity Food Purchase and Storage:

- Food Purchase: Types of purchasing purchase specification, selection of foods.
- Storage: Types of storage. Maintenance of stores, store room records.

UNIT IV

Quantity Food Preparation

- Menu: Types of menu, functions of menu, factors affecting menu and planning.
- Standardization and Portion Control, Stepping up off recipes.
- Environmental sanitation- Waste disposal, pest control & personal hygiene.

Unit V

Quantity Food Service

- Types of service – English, French, Russian, American.
- Styles of service – Waiter – Waitress service, Counter, Buffet, Banquet and vending.
- Table setting.

Practical:

- Standardization of selected recipes, their preparation,
- Calculating nutritive value, yield, cost per serving, portion size.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Familiar with basic food preparation, quantity food production and food presentation skills.
CO2	Acquire knowledge on types and uses of equipments in food production and service.
CO3	Learn about basic principles of personal & environmental hygiene & sanitation.
CO4	Adopt effective utilization of standardized recipes to enhance quality of life.
CO5	Applies quality standards for the evaluation of menus.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	2.8	3	3	3

RECOMMENDED TEXTBOOKS:

- Patil P.V. (2007), Quantity Food preparation Techniques, Aavishkar Publishers, Jaipur.

- Sethi, M & Malhan. S. (2006), Catering Management, An Integrated approach, Wiley Eastern Ltd., New Delhi.

REFERENCE BOOKS:

- Bobby, G. (2005), Food and Beverage service, Jaico Publishing House, Chennai.
- Philip J.E., 2003, Modern Cookery for teaching and trade, Orient Longman Ltd., Hyderabad, India.
- Manish, R. (2000), Food Service Management, Rajat Publication, New Delhi.
- Verghese. B. (1999), Professional Food & Beverage Service Management, Macmillan India Ltd., Chennai.
- June PP and Monica.T (1997). West and Wood's Introduction to Food Service, Simon & Schuster / A Viacom Company, New Jersey.

JOURNALS:

- Journal of Food Science (International)
- Journal of food Quality

E-LEARNING RESOURCES:

- https://www.academia.edu/33471336/Foodservice_Systems_A_Guide_to_Centralized_Foodservice_Systems_INTRODUCTION_TO_FOODSERVICE_SYSTEMS
- <http://www.preservearticles.com/articles/brief-notes-on-the-classification-of-kitchen-equipments/5085>
- <https://opentextbc.ca/foodsafety/chapter/storage-temperatures-and-procedures/>
- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=110626>
- https://www.tutorialspoint.com/food_and_beverage_services/food_and_beverage_services_types_of_service.htm

FOOD PRESERVATION

SEMESTER III/ Allied III

HOURS: 75

SUBJECT CODE: 172393

CREDITS: 5

COURSE OBJECTIVES:

To enable students

- To understand the need for Food Preservation
- To learn the principles and the methods of preservation of commonly available foods.
- To understand the methods of spoilage of foods.

COURSE OUTLINE:

UNIT I

General Principles of food preservation – Importance and scope of food preservation – Principles and methods of food preservation.

UNIT II

Preservation by food additives – Preservatives, Antioxidant, stabilizers, Emulsifying Agents, flavouring agents.

UNIT III

Preservation by use of low Temperatures – chilling, Freezing and Refrigeration.

Preservation by drying – Sun drying – Drying by mechanical dryers – Freeze drying.

UNIT IV

Preservation of foods by salting – Pickling

Preservation of foods as sugar concentrates.

Preservation of fruit beverages – Squash, Crush, Cordial, Fruit Juice Concentrates.

Unit V

Packaging and labelling – Types of packaging materials – advantages and disadvantages – Importance of labelling, types and nutritional information.

Practical:

- Survey of preserved foods available in the market.
- Preparation of pickles, sugar concentrates, squash, crush, cordial, fruit, concentrates, jams, jelly, etc.,

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understand the nature of microorganisms involved in food spoilage, food infections and intoxications.
CO2	Comprehend principles of various preservation and control techniques.
CO3	Apply scientific principles for effective food preservation.
CO4	Enable to understand the shelf life of different food articles.
CO5	Develop employability skills in food industries.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO4
CO1	3	3	2	2	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	2	3	3
AVERAGE	2.8	3	3	2.6	3

RECOMMENDED TEXTBOOKS:

- Meera Rao Patnakar, 2001: Food preparation, Anna Publications, Pushpabharathi Pvt. Ltd., New Delhi
- Sivasankar.B 2005: Food Processing and preservation, 3rd Edition, Prentice Hall of India Pvt Ltd., New Delhi.

REFERENCE TEXTBOOKS:

- Frazier, W.C. 1995 Food Microbiology, Tata Mc Graw Hill Book co., New Delhi.
- Journal of Food Science and Technology, 1995, Association of Food Scientists and Technologists, CFTRI, Mysore.
- Sudesh Neelam, 2002: Food Preservation, Agrotech Publishing Co., Khetopal, Udaipur.
- Thangam E.Philip, 2003: Modern Cookery for Teaching and the Trade, Vol.1, 5th Edition, Orient Lognmans Pvt. Ltd., New Delhi.
- R.P.Srivastava and Sanjeev kumar 2002: Fruits and vegetable preservation –Principles and practices, CBS Publishers and distributors private limited

JOURNALS:

- Journal of Food Processing and Preservation
- International Journal of Food and Bioscience

E-LEARNING RESOURCES:

- <https://edblog.hkedcity.netpdf/> food preservation and method
- www.betterhealth.vic.gov.au/ preservation by food additives
- <https://www.eufic.org/en/whats-in-food/article>
- <https://foodsafetyhelpline.com/salting-pickling-processes-food-preparation-> preservation
- <http://www.fao.org/3/v5030E/v5030Eom.html>
- agriexchange.apeda.gov.in – packing & labeling

NUTRITION THROUGH LIFE CYCLE

SEMESTER IV/Paper – VII
Subject Code: 172607

Hours: 75
Credits: 4

COURSE OBJECTIVES:

To enable students to

- Gain knowledge on the nutritional needs of individuals at different age level.
- Gain expertise in planning and preparing normal diets.

- Understand the required dietary allowances of an individual.

COURSE OUTLINE:

Unit I

Menu Planning

- Recommended Dietary allowances, Basic Five Food groups, Food exchange lists, Principles of planning meals for a family.
- Nutrient requirement during adulthood.
- To address the issues of nutritional concerns during pregnancy and lactations.

Unit II

Nutrition in pregnancy and lactation

- a. Physiological changes in pregnancy
- b. Pattern of weight gain during pregnancy
- c. Nutritional requirements during pregnancy
- d. Diet in Pregnancy
- e. Complications of pregnancy
- f. Physiology of lactation
- g. Nutrient requirements during lactation

Unit III

Nutrition in Infancy

- a. Nutrient requirements in Infancy
- b. Breast feeding – Its advantages over bottle feeding.
- c. Weaning – Supplementary foods.
- d. Artificial feeding – food substitutes.

Unit IV

- I. Preschool age (1-6 years)
 - a. Nutritional requirements
- II. School Going age (6-12 years)
 - a. Nutritional requirements
 - b. Packed lunch

Unit V

- I. Adolescence.
 - a. Nutritional requirements
 - b. Eating disorders – Bulimia, Anorexia Nervosa
- II. Nutrition in old age

- a. Changes during ageing
- b. Nutritional requirements
- c. Modification of diet for the aged

Practical:

Planning and Preparation of a days menu for

- a. Preschool children
- b. School going age – Packed lunch
- c. Adolescents
- d. Pregnant woman & Nursing mother
- e. Normal adult man & woman
- f. Old age

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understand the importance of good nutrition at various stages of life cycle
CO2	Able to plan diet for individuals according to the age.
CO3	Suggest the dietary guidelines for various age groups.
CO4	Enable to understand the physiological basis for nutritional needs of healthy human.
CO5	Gained knowledge on nutrition issues and recommends intervention support.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
C01	3	3	2	2	3
C02	3	3	3	3	3
C03	3	3	3	3	3
C04	3	3	3	3	3
C05	3	3	3	3	3
Average	3	3	2.8	2.8	3

RECOMMENDED TEXTBOOKS:

- Swaminathan, M. 2003, Advanced text book on Food & Nutrition, Second Edition, The Bangalore Printing and Publishing Co., Ltd., Bangalore.
- Krasuse, M.V., Malhan, L.K. 2004, Food, Nutrition and Dietetics, ELBS, Churchill Livingston.

REFERENCE BOOKS:

- Cataldo C.BB. Debryme, L.K. and Whitney, E.N. 1995, Nutrition and Diet Therapy, 4th Edition, West Publishing Co.,

- Garrow, J.S., James, W.P.T and Ralph Ann, 2000, Human Nutrition and Dietetics, Ninth Edition, Longman Singapore Publishers P, 1. Ltd.,
- Goopalan, C.Balasubramanian, S.C. and Ramasastry, B.V (2002). The Nutritive value of Indian foods, ICMR, New Delhi.
- Guthrie, A.H. (1993) Introduction to Nutrition, C.V. Mosbey Co., St. Louis.
- Stanfield P.S., 1992, Nutrition and Diet Therapy, Second edition, Jones and Bartlett Publishing Co.,

JOURNALS:

- The American Journal of Clinical Nutrition
- Journal of Nutrition and Diet Supplements

E-LEARNING RESOURCES:

- www.nal.usda.gov/fnic/fpyr/pyramid/html-food pyramid
- <https://www.icmr.inc>- nutrient requirement
- <https://www.nutrion.org.uk>- pregnancy
- <https://www.who.int>- infants nutrition
- <https://my.clevelandclinic.org/health>- pre-school age
- <https://www.who.int>> adolescence

HUMAN NUTRITION –I

SEMESTER –IV/Paper – VIII

HOURS: 75

SUBJECT CODE: 172608

CREDITS: 4

COURSE OBJECTIVES:

To enable students to understand

- The importance of nutrition in relation to health.
- Function, sources and metabolism in nutrition.
- Nutritive value of different foods.

COURSE OUTLINE:

Unit I

History of Nutrition – Definition of Nutrition, Health, Malnutrition – Over nutrition – Under nutrition – Nutritional care and support – Signs of good and poor Nutrition.

Unit II

- a. Carbohydrates – Definition, Classification, Functions, Sources.
- b. Digestion and Absorption of Carbohydrates,
- c. Maintenance of Blood glucose level,

- d. Role of Dietary fibre in Human Nutrition

Unit III

- a. Proteins – Definition, functions, sources and RDA.
- b. B. Importance of Essential Amino acids, Non- essential amino acids. Limiting amino acid and mutual supplementation.
- c. Evaluation of protein quality – PER, NPU, BR, chemicals score, Nitrogen Balance studies
- d. Digestion and absorption of Proteins.

Unit – IV

- a. Lipids – Definition, functions, sources
- b. Essential fatty acids, non essential fatty acids. Characteristics of animal and vegetables fats.
- c. Lipid profile – lipoprotein ratio. Relationship between fat consumption and Cardio vascular disease.

Unit - V

- a. Energy – Definition, Determination of energy value of foods – Direct method (Bomb calorimeter) Indirect method (Benedict's Oxy Calorimeter) Physiological fuel value and gross fuel value.
- b. B. Basal metabolism – Definition, factors affecting, determination of BMR by direct and indirect method. Respiratory, Quotient. Energy requirements during work by factorial method. SDA

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	In depth understanding of the role of foods and nutrients in maintaining health
CO2	Apply the role of nutrition in healthy eating and prevent diseases
CO3	To analyze the relationship between nutritional health and food selection
CO4	To develop strategies based on current issues for promotion of nutritional well-being among the people.
CO5	Promote employability skills in various health sectors.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	3
CO2	2	3	3	3	3
CO3	3	3	3	3	3
CO4	2	3	3	3	3
CO5	3	3	3	3	3

AVERAGE	2.6	3	3	2.8	3

RECOMMENDED TEXTBOOKS:

- Shubhangini A.Joshi, 2008. Nutrition and Dietetics, Tata Mc.Graw Hill Publishing Company Limited, New Delhi.
- Sumathi R. Mudambi, M.V. Rajagopal, 2001, Fundamentals of Foods and Nutrition, New Age International Publishers, New Delhi

REFERENCE BOOKS:

1. Bamji Melilab S. Et al (ed) 1998, Text Book of Human Nutrition, Oxford and IBH Publishing & Co Pvt Ltd., New Delhi
2. Guthrie Helen A and Mary Frances Picciano., 1999 Human Nutrition, WCB, McGraw Hill Boston.
3. Mahan Kathleen L and Sylvia Escott. Stuncy (ed) 2000 Krause's Food, Nutrition and Diet therapy W.B. Saunders company Philadelphia.
4. Park & Park 1995, Park's Text Book of Preventive and Social Medicine, Banarsidoss, Bhauot Publishers, Jabalpur 48 – 2001.
5. Sunetra Roday, 2007, Food Science and Nutrition, Oxford University Press.

JOURNALS:

- Journal of Human Nutrition and Dietetics
- British Journal of Nutrition

E-LEARNING RESOURCES:

- <https://www.nin.res.in> /- malnutrition
- <https://med.libretexts.org>- digestion and absorption of CHO
- <https://www.naspghan.org> - digestion and absorption of protein
- <https://bio.libretexts.org>-lipid function
- <https://www.jbc.org>- direct method [bomb calorimeter]

INTERIOR DESIGN

SEMESTER IV/Allied – IV

Hours: 75

Subject Code: 172694

Credits: 5

COURSE OBJECTIVES:

To enable students to

- Gain understanding of the basic art principles.

- Learn apply colour in the interiors.
- Develop ability to apply the above knowledge to create interesting and beautiful interiors for varied purposes.

COURSE OUTLINE:

Unit I

Elements of design – types of design, principles of design, Harmony: Balance, proportion, Rhythm and emphasis. Colour – Qualities of Colour – Prang colour chart, Colour Harmonies, developing colour schemes for different rooms.

Unit II

Furniture and Furnishings: Selection, arrangements of furniture in different rooms. Different types of furnishing material- factors considered in their selection.

Windows and window treatment: Selection, use and care of curtains and draperies.

Unit III

Floor coverings: Selection, care and maintenance of carpets & rugs.

Wall Finishes and Covering: Types and care.

Unit IV

Lighting – Importance – Principles and types of lighting, lighting needs for various activities.

Unit V

Accessories – Selection, types, use and care of accessories. Flower arrangement

PRACTICAL:

1. Evaluation of Design
2. Preparation of colour chart and various colour schemes
3. Application of art principles in Area arrangement and window treatment

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Able to apply basic art principles in home decors
CO2	Gain employment opportunities as interior designer
CO3	Apply the knowledge pertaining to interior design to build self and the environment.
CO4	Gained knowledge in principles of Interior design for holistic living
CO5	To analyse interiors and decorative arts through contemporarily design solutions.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2
CO2	3	2	3	3	2
CO3	3	2	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	2.8	3	3	2.4

RECOMMENDED TEXTBOOKS:

- Chaudri S.N.2009, Interior Design. Published by Aavishkar publishers and distributors, Jaiipur.
- Nicholas Barnard, 1997 The complete Home Decorating Book, Darling Kinders el, London

REFERENCE BOOKS:

- Hideki Chijiwa, 1988: Colour Harmony, 4th Printing, Rock Fort Publishers, India.
- Jane Lott, 1985: Floors and Flooring, Conron OCT Ltd., London.
- Joh Cullen, 1986: The Complete Interior Decorator, G.B.
- Nina Grunfeld, 1994: The Better Home Conran Octopus Ltd., London
- Nonie Niesewand 1990: Tricia Guilds Natural flower arranging, First edition, London.

JOURNALS:

- Journal of Interior design
- International Journal of Interior Architecture

E-LEARNING RESOURCES:

- KEVINRIGDONElementsandPrincipalsof Design.pdf
- <https://www.researchgate.net/publication/290591878> - Factors influential in Consumers' Furniture selection and their Preferences regarding Product Features
- <https://www.researchgate.net/publication/320800578> _Interior_Finishing_Materials
- <http://anj.co.in/idea-at-anj/> importance-of-lighting
- <https://www.researchgate.net/publication/315835473> _Interior_Decoration

FOOD SERVICE MANAGEMENT

SEMESTER V / Paper – IX

Hours: 90 hours

Subject Code:172609

Credits: 4

COURSE OBJECTIVES:

To enable students to

- Understand basic principles of management in food service units.
- Become conscientious caterers and food service administrators.
- Learn about different styles of catering.

COURSE OUTLINE:

Unit I

Food Service Industry

- History of Food Service Industry
- Types
- Commercial – Restaurant, Hotels, Fast food and cafeterias
- Welfare – Hospital, Industry, School/college
- Transport Catering
- Unit II
- Physical Plant: Space allocation, flow of traffic, planning and positioning of work areas – receiving, storage, pre preparation & cooking, service and dishwashing area.

Unit II

Physical Plant: Space allocation, flow of traffic, planning and positioning of work areas – receiving, storage, pre preparation & cooking, service and dishwashing area.

Unit III

Organisations and Management

- Organisation – Definition, Types of Organisations- their advantages and disadvantages.
- Management – Definition, Principles, Tools – Organisation chart, Job description, Job specification, Job schedule.

Unit IV

Personnel Management

- Recruitment, Selection, Induction, Training, Promotion and transfer, Dismissal, performance appraisal – rating scales, PERT>
- Labour Laws and Welfare measures

Unit V

Financial Management

- Factors Affecting Food Cost, Break Even Analysis
- Cost control – Food cost, Labour cost and over head cost.
- Pricing – Cost plus pricing, rate of return pricing, factors affecting pricing
- Budget – Definition, types of Budget

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Capability to function as a food service operator. .

CO2	Build up knowledge in the administration of various food service systems.
CO3	Able to relate the product flow with manufacturer and the customer.
CO4	Develop nutritional menus for food science production.
CO5	Understand and handle resources in a food service institution.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3
CO2	3	3	3	3	3
CO3	3	2	3	3	3
CO4	3	2	2	3	3
CO5	3	3	3	3	3
AVERAGE	3	2.8	2.6	3	3

RECOMMENDED TEXTBOOKS:

- Puroola B.Z (2009). Dining room and Banquet Management, Alfa Publications' New Delhi
- Ravi. A (2008) Basic Principles of Kitchen Design, Sublime Publications Jaipur

REFERENCE BOOKS:

- Malhotra (2002) Food & Beverages Management & Cost control, Kanishkar Publishers, New Delhi.
- West B.B. et al. 1991, Food service in Institution, John wiley and Sons, Inc' New yark.
- Colleer, M.and Sussams, C.1990, Success in Principles of catering, John Murray Publishers, London
- Kotschever, L., Terrel M.E., 1971, Food Service Planning, Lay out equipment, 2nd Edition, John Wiley and Sons Inc., New York
- Sethi, M and Malhan, S. 2006, Catering Management, An Integrated Approach. Wiley Eastern Ltd., New Delhi

JOURNALS:

- International Journal of Contemporary Hospitality Management
- Journal of Culinary Science and Technology

E-LEARNING RESOURCES:

- [http://www.ihmbbs.org/upload/CHAPTER-0\(THE%20HOTEL%20&%20CATERING%20INDUSTRY\).pdf](http://www.ihmbbs.org/upload/CHAPTER-0(THE%20HOTEL%20&%20CATERING%20INDUSTRY).pdf)
- <https://www.dodea.edu/edSpecs/upload/Food-Service-15-Nov-11.pdf>
- <http://ncert.nic.in/textbook/pdf/lehe104.pdf>
- <https://pdfs.semanticscholar.org/6651/55d6d884b0ca81e936ccdccd681cfc2bce46.pdf>

- https://icmai.in/upload/Students/Syllabus-2012/Study_Material_New/Inter-Paper8-Revised.pdf

HUMAN DEVELOPMENT

SEMESTER – V/Paper -X
SUBJECT CODE: 172610

HOURS: 90
CREDITS:4

COURSE OBJECTIVES:

To enable students to

- Develop an understanding of an individual from infancy to adolescence so that they can be guided effectively.
- Develop an awareness of the problems of children and adolescents and old age.
- Learn about exceptional children and address their needs

COURSE OUTLINE:

Unit I

Growth and development – Meaning and importance of growth and development , Principles of development, Prenatal development – Conception, stages of prenatal development, Prenatal care, Discomforts and complications, factors affecting prenatal development, birth process, types of birth, test tube baby.

Unit II

Babyhood – (Birth to two years) – Characteristics – Adjustment of new born to temperature, breathing, feeding and elimination. Physical, social, emotional, intellectual and languages development. Child rearing practices- feeding, weaning, supplementary foods, toilet training bathing, sleeping, clothing, immunization schedule.

Unit III

Early Childhood period (2 to 6 years) – Characteristics Physical, social, emotional, intellectual and moral development.

Exceptional Children : Physically challenged – Blind, Deaf, dumb and crippled. Mentally challenged – Cerebral Palsy Mongolism, criticism, mental retardation, phenyl ketonuria. Gifted Children.

Unit – IV

Late childhood (6 to 12 years) characteristics, physical, social, emotional, intellectual, language and moral development.

Adolescence – Characteristics, physical, Social, emotional, intellectual, language and moral development. Problems of adolescence. Delinquency – Definition causes and rehabilitation.

Unit – V

Adulthood – Early and middle adulthood – Characteristics, Physical changes and role changes, Menopause and andropause.

Old age – Characteristics, Problems – Psychological, Physical, Social, Emotional, and Economical. Homes for the aged.

Practical:

1. Observation on physical, social, emotional and intellectual development.
2. Socio – metric study of adolescents.
3. Visit to a centre for exceptional children.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Enlighten the students on the principles of growth & development during various stages
CO2	Understand the prenatal care to reduce the ratio of congenital abnormalities.
CO3	Apply the gained knowledge in better child rearing practices.
CO4	Able to analyse abilities, knowledge and actions to foster overall well being.
CO5	Make students to contribute to communities through the best practices of family therapy

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	3
CO2	1	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	2.8	3	2.8	2.8	3

REFERENCE TEXTBOOKS:

- Suriakanthi, Child Development. An Introduction Kavitha Publication, Gandhigram, Tamil Nadu, 1997.
- Diane E.Papalia et al., Human Development New Delhi: Oxford and IBH Publishing Company. Pvt Ltd., 1975

REFERENCE BOOKS:

- Bassard, J. Family Behaviour and child Development, Agro Botanical Publishers India. 1996
- Chintamanikar, Exceptional Children, Sterling Publishers Pvt Ltd., New Delhi, 1992

- Hurlock, E.B., Child Developmental Psychology, Tata Mc Graw Hill Book Co, New Delhi, 1999
- Jaganath Mohanty, Child Development and Education Today, Deep and Deep Publication Pvt Ltd., New Delhi, 1998.
- James, w.vanderzanden, Human Development, Mc Graw Hill Inc' New Delhi, 1995
- Mahesh Bhargava, Introduction to Exceptional children, Sterling Publishers Pvt. Ltd, New Delhi, 1994.
- Poonam Sharma, Lata Gairda, Fundamentals at Child Development and child Care. New Delhi, Sterling Publishers Private Ltd., 1990.
- Mangal, S.K Advanced Educational Psychology, New Delhi: Prentice Hall of India, 2006.
- Dr. Mohan Kumar, Dictionary of psychology, Delhi, A.I.T.B'S. Published' 2007.
- Robert A Baron, Psychology, New Delhi Prentice – Hall of India Private Ltd., 2008.
- Clifford T. Morgan et al., Introduction to psychology, New Delhi, Tata Mc. Graw Hill, Publishing Company Pvt' Ltd', 2008.

JOURNALS:

- International Journal of Ageing and Human Development
- Journal of Human Development and Capabilities

E-LEARNING RESOURCE

- <https://my.clevelandclinic.org>- prenatal development
- <https://www.tuv.edu>- child rearing practices
- <https://library.ccis.edu>- exceptional children
- <https://www.childtrends.org>- adulthood characteristics
- <https://www.ncbi.nlm.nih.gov>- old age problems social

HUMAN NUTRITION II

Semester : V/Paper – XI
SUBJECT CODE: 172611

HOURS: 90
CREDITS: 4

COURSE OBJECTIVES:

To enable the students to understand

- The importance of nutrition in relation to health
- Functions, sources and metabolism of nutrients.
- Nutritive value of different foods.

COURSE OUTLINE:

Unit – I

Fat soluble vitamins – vitamins A, D, E, K – Functions, sources, requirements, effects of deficiency, Toxicity

Unit – II

Water Soluble Vitamins – Ascorbic acid, Thiamine, Riboflavin and Niacin, Folic acid, Vitamin B12, Pyridoxine, Biotin and Pantothenic acid Functions, sources, Requirements, effects of deficiency, Toxicity

Unit – III

Macro minerals – Calcium and Phosphorus – functions, food sources, food sources, requirements and effects of deficiency

Unit IV

Micro minerals – Copper, Fluorine, Zinc, Iron and Iodine – functions, food sources, requirements and effects of deficiency

Unit V

Water and Electrolytes – Distribution of water and Electrolytes water Balance – intake, loss, water intoxication, effects of dehydration. Computer in the management of aNutrition practices.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Critically evaluate and derive requirements for specific macronutrients.
CO2	Understand critical periods in growth and development and impact of malnutrition.
CO3	Combat nutritional inadequacies
CO4	Making aware of importance of computer in relation with nutrition research.
CO5	Adopt effective utilization of nutrients to meet the existing nutritional challenges.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	2	2	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	2.8	2.8	3

RECOMMENDED TEXTBOOKS:

- B.Srilakshmi (2016), Nutrition Science, fifth Publication, New Age International (P) Ltd.

- Sunetra Roday, 2007, Food Science and Nutrition and Dietetics, Tata Mc.Graw Hill Publishing Company Limited, New Delhi
- Shubhangini A.Joshi, 2008. Nutrition and Dietetics, Tata Mc. Graw Hill Publishing Company Limited, New Delhi.
- Sumathi R.Mudambi, M.V. Rajagopal, 2001, Fundamentals of Foods and Nutrition, New Age International Publishers, New Delhi.
- Mahan, Escon Stump 2004, Krause's Food, Nutrition and Diet Therapy, Saunders, Elsevier Publishers, U.S.A

REFERENCE BOOKS:

- Bamji Melilab S.et al (ed) 1998, Text Book of Human Nutrition, Oxford and IBH Publishing & Co PPvt Ltd., New Delhi
- Guthrie Helen A and Mary Frances Picciano, 1999 Human Nutrition, WCB, McGraw Hill Boston.
- Park & Park 1995, Park's Text Book of Preventive and Social Medicine, Banarsidoss, Bharti Publishers, Jabalpur 48-2001:
- Passmore R. And M.A. Eastwood, IggO, Davison and Passmore, Human Nutrition, Oxford and IBH Publishing Co' New Delhi.
- Robinson Corinne, H. Marilyn, R.Lawler, 1982, Normal and Therapeutic Nutrition, Oxford and IBH Publishing Co' New Delhi.
- S.Shils, M.E., James A Olson Moshe Shike, 1994 Modern Nutrition in Health and Disease Lea & Febiger, Philadelphia.
- Swaminathan, M. 1988, Essential of Food and Nutrition, Volume I & II, the BAPPCO Ltd., Bangalore
- Williams Sue Rodwell, 1985, Nutrition and Diet Therapy Times Mirror Mosby College Publishing St. Lois

JOURNALS:

- Journal of Human Nutrition
- The Journal of Nutrition

E-LEARNING RESOURCES:

- <https://www.ncbi.nlm.nih.gov> - fat soluble vitamins
- <https://ods.od.nih.gov> - vitamin B12
- <https://www.vofmhealth.org>- macro minerals
- <https://www.nutrition.org.uk>- micro minerals
- www.fao.org- computers in the management of a nutrition practises

DIETETICS

Semester: V/Paper – XII
SUBJECT CODE: 172612

HOURS: 90
CREDITS: 4

COURSE OBJECTIVES:

- To enable students
- To obtain knowledge on role of diet in disease conditions.
- To gain experience in planning, preparing and serving therapeutic diet.

COURSE OUTLINE:

Unit I

Principles of diet therapy – routine hospital diets – special feeding, methods – tube feeding, parenteral nutrition.

Etiology and modification of diet in febrile conditions – Typhoid, Tuberculosis.

Unit II

Etiology and modification of diet in Obesity and Underweight.

Prevalence, pathogenesis, risk factors and modification of diet – Atherosclerosis and hypertension.

Unit III

Diabetes mellitus – prevalence, types, etiology, symptoms, diagnosis and treatment – Etiology and modification of diet in diseases of the kidney – glomerulonephritis, nephritic syndrome, acute and chronic renal failure – urinary calculi

Unit IV

Etiology and modification of diet in gastro intestinal disease – Peptic ulcer, Diarrhoea and Constipation.

Etiology and modification of diet in disease of liver and gall bladder – Hepatitis, Cirrhosis.

Unit V

Risk factors and modification of diet in Cancer – role of antioxidants and fibre.

The dietitian – Responsibilities in Indian context – Diet counselling.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Plan diet for diseases across the lifespan in diverse cultures and for different income levels
CO2	Understand the dietary modifications for various diseases.
CO3	Provide nutritional counselling and education to individuals, groups and communities using a variety of communication strategies.
CO4	Aware of code of ethics and role of dietician in the society
CO5	Gain knowledge on the preparation of hospital diets

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5

CO1	3	3	2	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	2	2	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	2.8	3	3

RECOMMENDED TEXTBOOKS:

- B.Srilakshmi (2014), Dietetics, seventh edition, Publication, New Age International (P) Ltd.
- Swaminathan, M.2003, Advanced text book on Food & Nutrition, Second Edition, The Bangalore Printing and Publishing Co., Ltd., Bangalore.
- Gopalar. C.Balasubramanian, S.C. and Ramasastry, B.V. 2002 The Nutritive value – I Indian foods, ICMR, New Delhi.

REFERENCE BOOKS:

- Antia F.P. 1997 Clinical Nutrition and Dietetics, Fourth Edition, Delphii London, New York” Oxford University Press
- Krause, M.V Malhan, L.K.2004, Food, Nutrition and Diet therapy 11th edition W.B. Saunders, & C., Philadelphia.
- Robinson. C.H. Lau-ler M.R., Chenveth, WL., and Garwick A.E., 1986. Normal and Therapeutic Nutrition. Macmillan Publication Co., New York.
- Williams S.R. 1972. Essentials of Nutrition and Diet therapy, second edition, St. Loius.
- Cataldo., C.B. Debryme, L.K. and Whitney, E.N. 1995, Nutrition and Diet Therapy, 4th Edition, West Publishing Co.,
- Stanfield P.5., 1992 Nutrition and Diet Therapy, second edition, Jones and Bartlett publishing co.,
- Garror, J.S.James, W.P.T and Ralph Ann, 1994, Human Nutrition and Dietetics, Ninth Edition, longman Singapore Publishers Pvt Ltd.,
- Guthrie. A.H (1993) Introduction to Nutrition, C.V. Mosbey Co., St. Lois. PassnIrre. R and Brock, J.B. (1989) Human Nutrition and Dietetics EIBS, Churchill Livingston.

JOURNALS:

- Journal of the Academy of Nutrition & Dietetics
- Journal of Human Nutrition and Dietetics

E-LEARNING RESOURCES:

- https://www.rdehospital.nhs.uk/docs/trust/foi/foi_responses/2015/december/Enteral_feeding_guideline~version_Jan_201411.pdf

- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5038894/>
- https://www.kidney.org/sites/default/files/11-50-0114_docsnutrikidfail_stage1-4.pdf
- http://www.apiindia.org/pdf/medicine_update_2011/24_diet_in_diabetes.pdf
- <https://www.untypoint.org/cedarrapids/filesimages/Services/Digestive%20Health/Information%20Regarding%20Your%20Diet%20for%20Peptic%20Ulcer%202013.pdf>
- https://www.researchgate.net/publication/287348329_Ant-cancer_diet_Reviewing_the_role_of_nutrition_in_cancer_prevention
- <http://clinicalnutritionupdate.in/wp-content/uploads/2015/01/Diet-Counselling.pdf>

PRINCIPLES OF RESOURCE MANAGEMENT

Semester – V/Elective Paper -1

HOURS: 75

SUBJECT CODE: 172613

CREDITS: 5

COURSE OBJECTIVES:

To enable students to

- Understand concepts & principles of Management & its functions.
- Understand the significance of management in changing environment.
- Help students to learn to use resources effectively.

COURSE OUTLINE:

Unit I

Objectives & Scope of Management

Management Process: Planning, Controlling and Evaluating.

Values, goals and standards: Classification and Inter relatedness.

Unit II

Decision making: Types of decision – Steps in decision making, methods of resolving conflicts.

Unit III

Resources in the family: Classification, factors affecting use of resources – family size, type, composition, stages in family life cycle, customs, traditions. Income, location

Unit IV

Time management: Time norms, Tools in time management, Time plans.

Money Management: Sources of Income, Types of income ‘Budgeting’ Account keeping – Records. Savings – Importance, Types of institutions.

Unit V

- Energy management: Types and causes of fatigue, methods of overcoming fatigue, Body Mechanics.

- Work Simplification: Definition, Techniques of work simplification. Mundel's classes of change

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Learnt to use resources effectively
CO2	Understand the significance of resource management in changing environment
CO3	Apply the skills learnt to simplify work and save energy
CO4	To develop cognizance of the importance of management principles.
CO5	Identify and evaluate social responsibility and issues in business situations.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	3
CO2	2	3	3	2	3
CO3	3	3	3	3	2
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	2.8	3	3	2.6	2.8

RECOMMENDED TEXTBOOKS:

- Bharathi V.V and Jacintha, M.1994 Family Resource Management Discovery Publishing House, New Delhi.
- Verghese, M.A. Ogale N.M & Srinivasan, K 2005 Home Management New International (P) Ltd., Publishers, New Delhi

REFERENCE BOOKS:

- Gross I.H & Crandall, W.E., 1967, Management of Modern Families Wiley Eastern Pvt Ltd., New Delhi.
- Nickell, P & Dorsey, J.M. 1991, Management in family living. Willey Eastern Pvt Ltd., New Delhi.
- Deacon, R.E, Firebaugh, E.M. 1915 – Home Management – Context concept Printed in the U.S.A

JOURNALS:

- The Journal of Human Resources
- The International Journal of Human Resource Management

E-LEARNING RESOURCES:

- <http://download.nos.org/srsec321newE/321-E- Lesson-10.pdf>
- <http://cmsnew.pdst.ie/sites/default/files/Resource%20Mgt.pdf>
- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=122107>
- http://shodhganga.inflibnet.ac.in/jspui/bitstream/10603/129462/8/08_chapter3.pdf
- <http://www.yourarticlelibrary.com/home-management/home-science-work-simplification-methods-with-diagram/47806>

COMMUNITY NUTRITION

Semester – VI/Paper – XIII
SUBJECT CODE: 142614

HOURS: 90hrs
CREDITS: 4

COURSE OBJECTIVES:

- To enable students to understand the Malnutrition problems and prevalence in India.
- Gain knowledge on the National effort in combating malnutrition
- Appreciate the National and International contributor towards National improvement in alleviating nutrition problems.

COURSE OUTLINE:

Unit I

Nutrition and National development, Nutrition transition – changing food consumption patterns and growing burden of non communicable diseases.

Unit II

Nutritional problems confronting our country – PEM, Iodine Deficiency Disorder, Fluorosis, Vitamin A deficiency, Iron Deficiency Disorder – Prevalence, Symptoms and prophylaxis

Unit III

Methods of Assessment of Nutritional Status – Sampling – Direct assessment – Diet survey, Anthropometry, Clinical, Biophysical and Biochemical estimation, Indirect Assessment – Vital Statistics.

Unit IV

Role of National, International Organisations and Programmes – FAO, UNICEF, WHO, ICMR, NIN, CFTRI, ICDS, Chief Minister's Nutritious Noon Meal programme, ANP & SNP.

Unit V

Nutrition Education – Definition & Methods Audio visual aids – types and uses.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understand the concept and purpose of nutritional status assessment in community setting.

CO2	Understand the nutritional concerns among vulnerable sections of the community and strategies to combat them.
CO3	Gain knowledge with regard to standard methods and techniques for assessing nutritional status.
CO4	Be familiar with the use of indices and indicators for screening and consequent identification of malnutrition in the community.
CO5	Provide nutrition counseling and education to individuals and communities.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	2.8	3

RECOMMENDED TEXTBOOKS:

- V.V.R.Seshubabu (1996), Review in Community Medicine, Paras Medical Books, Hyderabad
- K.Park,(2000), Preventive and Social Medicine, 16th Edition, Banarsidas Bhanot publishers, Jabalpur

REFERENCES BOOKS:

- Jellifee D.B(1996), The assessment of nutritional status in the community-WHO Monograph series –No:53, Geneva
- Shanthi Ghosh (1977), The Feeding and Care of Infants. Voluntary Health Association of India, New Delhi
- Shukla.P.K (1982), National Problems Of India – Prentice Hall of India Pvt Ltd, New Delhi.

JOURNALS:

- Journal of Community Nutrition and Health
- International Journal of Epidemiology

E-LEARNING RESOURCES:

- <http://agritech.tnau.ac.in-agriculturalproducts>
- <https://www.ncbi.nlm.nih.gov-nutritionalassessment>
- <https://www.medicalnewstoday.com-anemia>

- <https://www.nhp.gov.in/national-vitamin-a-prophylaxis-program-pg>
- <https://www.dshs.wa.gov/altsa/program-services> /nutrition-education

HUMAN NUTRITION – PRACTICALS

Semester – VI/Paper – XIV

HOURS: 90hrs

SUBJECT CODE: 142615

CREDITS: 5

COURSE OBJECTIVES:

- To understand the use of various equipment for food analysis.
- To prepare students to know about life style wellness, healthy living.
- Gain knowledge on macro and micro nutrients present in the food stuff.

COURSE OUTLINE:

Unit – I

Qualitative test for Sugars – glucose, fructose, lactose and maltose

UNIT – II

Qualitative test for minerals

Qualitative test for proteins – Albumin

UNIT – III

Quantitative estimation of reducing sugar – glucose

UNIT – IV

Quantitative estimation of vitamin C in lime juice

Quantitative estimation of vitamin C in raw cabbage

UNIT – V

Quantitative estimation of Phosphorus in food

Quantitative estimation of Iron in food

Quantitative estimation of Calcium in food

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understand the laboratory techniques for assessing macro nutrients.
CO2	Evaluate the nutritional properties its reactions.
CO3	Analyse the principles behind the analytical technique of food products.

CO4	Competence to use various equipment for the analysis of nutrients
CO5	Perform qualitative analysis of macro and micronutrients

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO4
CO1	3	3	3	3	3
CO2	2	3	2	2	2
CO3	3	3	3	3	3
CO4	3	2	3	3	3
CO5	3	3	3	3	3
AVERAGE	2.8	2.8	2.8	3	2.8

RECOMMENDED TEXTBOOKS:

- Bamji Melilab S. Et al (ed) 1998, Text Book of Human Nutrition, Oxford and IBH Publishing & Co. Pvt Ltd., New Delhi.
- Mahm Kathleen L and Sylvia.Escott. Stuncy (ed) 2000 Krauses Food, Nutrition and Diet therapy W.B. Saunders company Philadelphia.

REFERENCE BOOKS:

- Passmore R. And M.A Eastwood, 1990, Davidson and passmore, Human Nutrition and Dietetics, ELBS, Churchill Livingstone.
- Robinson Corinne, H.Marilyn, R. Lawler, 1912, Normal and Therapeutic Nutrition, Oxford and IBH publishing co., New Delhi.
- Williams Sue Rodwell, 1986, Nutrition and Diet therapy Times Mirror. Mosby College Publishing St. Lois.
- Garrou. J.S.and W.P>PT James 1993, Human Nutrition and Dietetics, Churchill living stone.
- Park & Park 1995, Parks Text Book of Preventive and Social Medicine. Banarsidoss. Bhauot, Jabalpur 48 – 2001.
- Guthric Helen A and Mary Frances picciano, 1999 Human Nutrition, WCB, McGraw Hill Beston.
- Shils, M.E., James A Olson Moshe Shike, 1994, Modern Nutrition in Health and Disease Lea & Febizer, Philadelphia.
- Swaminathan, M. 1988, Essential of Food and Nutrition, Volume I & II, the BAPPCO Ltd., Bangalore.

JOURNALS:

- Journal of Human Nutrition
- The Journal of Nutrition

E-LEARNING RESOURCES:

- <https://vlab.amrita.edu>- qualitative test for sugar
- <https://www.gamineral.org>- qualitative test for minerals
- <https://pubs.acs.org>
- <https://pdfs.semanticscholar.org>>

DIETETIC PRACTICALS**Semester : VI/Paper – XV****SUBJECT CODE: 142616****HOURS: 90hrs****CREDITS: 4****COURSE OBJECTIVES:**

- To gain knowledge in planning therapeutic diet
- To apply therapeutic knowledge in planning therapeutic diet.
- To prepare and evaluate diet for different diseases.

COURSE OUTLINE:**Unit I**

- Planning and preparation of a) formula feeds b) Clear liquid diet c) Full liquid diet d) Soft diet.
- Planning and preparation of therapeutic diets for typhoid and tuberculosis

Unit II

Planning and preparation of therapeutic diets for

- Peptic ulcer
- Constipation (high fibre diet), diarrhoea
- Hepatitis, cirrhosis

Unit III

Planning and Preparation of therapeutic diets for

- Obesity
- Atherosclerosis

Unit IV

Planning and preparation of therapeutic diets for

- Diabetes mellitus
- Hypertension (low sodium diet)

Unit V

Planning and preparation of therapeutic diets for

- Nephritis, Nephrosis
- Cancer – High protein diet.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Gain skill in planning & preparing therapeutic diets
CO2	Ability to be a health professional
CO3	Apply the knowledge for diet counseling
CO4	Able to modify recipes and recipe proportions for dietary and volume production.
CO5	Gain knowledge in health promotion and disease prevention technique for holistic life.

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	2	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

RECOMMENDED TEXTBOOKS:

- Antia F.P. 1997 Clinical Nutrition and Dietetics, Fourth Edition, Delphii London, New York” Oxford University Press
- Gopalan. C.Balasubramanian, S.C. and Ramasastry, B.V. 2002 The Nutritive value – Indian foods, ICMR, New Delhi.

REFERENCE BOOKS:

- Krause, M.V Malhan, L.K.2004, Food, Nutrition and Diet therapy 11th edition W.B. Saunders, & C., Philadelphia.
- Robinson. C.H. Lau-ler M.R., Chenveth, WL., and Garwick A.E., 1986. Normal and Therapeutic Nutrition. Macmillan Publication Co., New York.
- Williams S.R. 1972. Essentials of Nutrition and Diet therapy, second edition, St. Louis.
- Cataldo., C.B. Debryme, L.K. and Whitney, E.N. 1995, Nutrition and Diet Therapy, 4th Edition, West Publishing Co.,

- Stanfield P.5., 1992 Nutrition and Diet Therapy, second edition, Jones and Bartlett publishing co.,
- Garrow, J.S., James, W.P.T and Ralph Ann, 1994, Human Nutrition and Dietetics, Ninth Edition, longman Singapore Publishers Pvt Ltd.,
- Guthrie. A.H (1993) Introduction to Nutrition, C.V. Mosbey Co., St. Louis. Passanelli, R and Brock, J.B. (1989) Human Nutrition and Dietetics EIBS, Churchill Livingstone.
- Swaminathan, M.2003, Advanced text book on Food & Nutrition, Second Edition, The Bangalore Printing and Publishing Co., Ltd., Bangalore

JOURNALS:

- Journal of the Academy of Nutrition and Dietetics
- Journal of Human Nutrition and Dietetics

E-LEARNING RESOURCES:

- <http://alraziuni.edu.ye/book1/nursing/fundamentals%20of%20food,nutrition%20and%20diet%20therapy.pdf>
- http://www.who.int/nutrition/publications/public_health_nut5.pdf
- http://www.scielo.br/pdf/abc/2010nahead/en_aop08410.pdf
- https://www.niddk.nih.gov/-/media/Files/Health-Information/Communication-Programs/NDEP/health-care-professionals/ndep-diet-counseling-webinar-may-2014_508.pdf?la=en&hash=039CC4C1BB78BDCC946A6EFBF88AF2AD
- https://www.who.int/nutrition/publications/public_health_nut6.pdf

CONSUMER EDUCATION

Semester : VI/Elective Paper : 11

HOURS: 90hrs

SUBJECT CODE: 142617

CREDITS: 5

COURSE OBJECTIVES:

To enable students to

- Be aware of the consumer's problems in the market
- Become aware of the rights and responsibilities and enlightened consumers.
- Realise the importance of the effective role of consumer in the market and develop good buying skills in the selection of goods in the market.

COURSE OUTLINE:

Unit – I

Consumer and Consumer Problems: Definition of consumer, Problems of Consumers, frauds, faulty weights and measures, adulteration and other malpractices – causes and consequences.

Unit – II

Markets: Definition, Types of markets, marketing functions, e- marketing.

Unit –III

Consumer Education; Scope of consumer education – Consumer Rights and responsibilities – Consumer Decision making, Buymanship skills.

Unit IV

Producers Ais to Consumers: Advertisement, brand, packaging labelling, grading.

Unit V

Consumer Protection: Standards, standardization, ISI,BIS, Agmark, other quality assurance sales, Consumer guidance societies.

Consumer Laws – COPRA, Drugs and Cosmetics Act, Essential Commodities Act, MRP Act.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understand the choices of goods and services
CO2	Able to know the rights and responsibilities of consumers
CO3	Gained knowledge on consumer protection laws to fight against unfair trade practices
CO4	Apply good buying skills become enlightened & education consumer
CO5	Gain knowledge in how local, national, global market can influence financial decisions

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2
CO2	2	2	3	2	2
CO3	3	2	3	3	3
CO4	3	2	3	3	3
CO5	3	3	3	3	3
AVERAGE	2.8	2.8	3	3	2.8

RECOMMENDED TEXTBOOKS:

- Khetarpaul N., and Grover, I.A Consumer Guide for Home Makers, Agrotech Publishing, Udaipur, 2000.
- Bhat. R.V and Rao Food Safety, Bapco Publishing Co. Ltd., Bangalore, 1997.

REFERENCE BOOKS:

- Geardan. H.C and Vailes, R.S. Economics for Consumers, America Book Co., 1961.
- Gupta, B.D. Consumption pattern in India, Tata McGraw Hill, 1973.
- London, D.L., & Briutta A.J.D Consumer behaviour, Tata McGraw – Hill Pub. Co., New Delhi, 2002.
- Sethi M. Znd Seetharaman, Consumerism, A. Growing concept, P. Phoneix Publishing House, New Delhi 1994.

JOURNALS:

- Journal of Consumer Policy
- International Journal of Consumer Studies

E-LEARNING RESOURCES:

- <http://www.consumer.ftc.gov>
- <http://www.consumerinterest.org>
- <http://www.food.gov.uk.packagingand> labelling
- <http://www.hg.org.consumerlaws>
- <http://www.economicshelp.org>

ENTREPRENEURSHIP DEVELOPMENT

Semester – VI/Elective III
SUBJECT CODE: 142618

HOURS: 75hrs
CREDITS: 5

COURSE OBJECTIVES:

To enable the students

- To study the concept of entrepreneur and entrepreneurship.
- To trace out the evolution and development of entrepreneurship and women entrepreneurs in our country.
- To guide to formulate project report.
- To suggest strategies to develop entrepreneurship in rural areas through self-help groups.

COURSE OUTLINE:

Unit I

Concept of entrepreneur and entrepreneurship, qualities of an entrepreneur, functions of entrepreneurs.

Factors affecting entrepreneurial growth – motivating factors, economic and non-economic factors.

Unit II

Ownership Structures – Proprietorship, Partnership, Company, Co-Operative, Selection of an appropriate for of ownership structure, ownership pattern in small scale enterprises in India.

Unit III

Project Identification selection, formulation – meaning and significant of project Report, Content of a project report, formulation of a project report, Planning Commissioner's guidelines for formulation

Unit IV

Institutional Finance to Entrepreneurs, Commercial bank. Other financial Institutions-IDBI, LIC, IFCI etc. Institutional support to small entrepreneurs-SIDCO, SSIB, TCOs

Unit V

Concept and functions of Women Entrepreneurs and self – help groups. Problems of Women Entrepreneurs. Government and Private training given to start an Enterprise, Marketing and profits obtained.

Practical:

- Case study of Women Entrepreneurs
- Study of Self –Help groups.

COURSE OUTCOMES:

CO Number	CO STATEMENTS
CO 1	Understand the importance of entrepreneurship for economic development
CO2	Establish a foundation of confidence and the skills necessary to achieve the goals.
CO3	Acquired knowledge about opportunities for new ventures and master the in entrepreneurship skills.
CO4	Able to understand different methods to assess the attractiveness of business opportunities
CO5	Develop knowledge in facing new challenges in entrepreneurial voyage

MAPPING- COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	3	3	3	3

RECOMMENDED TEXTBOOKS:

- Desai, V.(2004) Dynamics of Entrepreneurial Development & Management,Himalayan Publishing House,Chennai.
- Sharma S.,Singh,B and Singhal,S.,(2005).Entrepreneurship Development,Wisdom Publication,Delhi.

REFERENCE BOOKS:

- Gupta,C.B. and Srinivasan,N.P.(1985)..Entepreneurial Developments,Sultan,Chand & co.,New Delhi.
- Khanka,S.S(2006).Entrepreneurial Development,Sultan chand & co.,New Delhi.
- Lall,M.,and Sahal s.,(2006)Entrepreneurship,Excel Books,New Delhi.
- Balu. V.(2005).Entrepreneurial, Development Sri. Venkateswara publication,Chennai-4.
- Gupta C B. & Khanka (2008).Entrepreneurial and small business management,sultan Chand& Sons New Delhi.
- Balu, V. (2004).Entrepreneurial and small business promotion.Sri venkateswara Publications, Chennai

JOURNALS:

- Journal of Entrepreneurship Development
- International Journal of Entrepreneurship and Development Studies

E-LEARNING RESOURCES:

<http://mek.oszk.hu/11400/11406/11406.pdf>

http://planningcommission.nic.in/reports/sereport/ser/maker/mak_cht2b.pdf

http://entrepreneuriat.inforoutefpt.org/documents/ang_nc-4328_projet.pdf

https://dpi.wi.gov/sites/default/files/imce/cte/pdf/mme_standards.pdf

https://www.researchgate.net/publication/304024317_STATUS_OF_WOMEN_ENTREPRENEURSHIP_IN_INDIA

**QUAID - E- MILLATH GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS), CHENNAI - 600 002.**

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS



M.Phil., COMPUTER SCIENCE

**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION**

(OFFERED FROM THE ACADEMIC YEAR 2017 -2018)

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**QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMENS
(AUTONOMOUS)**

ANNASALAI, CHENNAI 600 002.

10. ELIGIBILITY

A Candidate who has qualified for the Master's Degree in Computer Science/Computer Applications/Information Technology of University of Madras or any other University recognized by the University of Madras as equivalent there to (including old Regulations of any University) subject to such conditions as may be prescribed

therefore shall be eligible to register for the Degree of Master of Philosophy (M. Phil) and undergo the prescribed course of study in a Department concerned.

A candidate who has qualified in Master degree with not less than 55% of marks in the concerned subject shall be eligible to register for M. Phil course. SC/ST candidates are exempted by 5% from the prescribed minimum marks.

11. DURATION

The duration of the M. Phil course shall be one year consisting of two semester for the full-time programme.

12. COURSE OF STUDY

The course of study shall consist of

Part-I : 3 written papers, and

Part-II : Dissertation.

The three papers under Part-I shall be:

Paper- I : Research Methodology

Paper –II : Performance Evaluation of Systems

Paper I & II in Part-I shall be common to all candidates in a course. Paper I,II& III shall consist of 5 units covering the subject requirements of the course offered. The Syllabi for Paper I,II&III has been approved by the board of studies. The subject specialization for paper III in Part-I shall be prescribed by each research Guide/Supervisor advisor which also approved by the board of studies. The number of specialized papers by the research advisor can be more than one. Paper- I & II shall be set externally and valued by two examiners, one internal and one external. The concerned HOD will be the Chairman of the Board of Examiners to pass the results. Paper III shall be conducted by the Controller of Examination.

13. SCHEME OF EXAMINATION

13.1 Part-I

Paper –I : Research Methodology

Paper-II : Data Analytics

Paper-III : Field of Specialization

13.2 Written Examination

The examinations for papers-I,II and III shall be taken at the end of March of every year. Each paper shall have 100 marks for the examination (written). The duration for each examination shall be 3 hours. A candidate shall be declared to have passed Part-I examination if he secures not less than 50% of marks.

13.3 Part-I Credits

Paper	Name of the Paper	Contact Hours	Library Hours	Total Hours	Credits
I	Research Methodology	6	4	10	6
II	Data Analytics	6	4	10	6
III	Field of Specialization	6	4	10	6
	Total			30	18

13.4 Part-II

13.4.1 Dissertation

For carrying out the dissertation the mandatory requirements is a pass in paper III. Every student is expected to give two seminars one concerning Review of Literature just within three weeks from the beginning of the second semester and other on data analysis just before the submission of the final draft of the dissertation. Candidates shall submit the Dissertations to the Controller of Examination at the end of 5th Month after the theory examination. The above said time limit shall start from 1st of the month which follows after the month in which Part-I examinations are conducted. If a candidate is not able to submit his Dissertation within the period stated above, he shall be given an extension of one month time with penalty. One external examiner and the Research Guide/Supervisor shall value the Dissertation. The external examiner should be University within Tamilnadu.

13.4.2 Part-II Credits

Paper	Evaluation	Marks	Credits
IV	Dissertation Evaluation	100	18

14. QUESTION PAPER PATTERN

The pattern of Question Paper will be easy type. The students should answer 5 out of 10 questions and each question will carry 20 marks.

15. CLASSIFICATION OF SUCCESSFUL CANDIDATES

The candidates who passed the Part-I and Part-II examinations in their first attempt shall be classified as follows.

3. 50% to 74%
4. 75% and above Highly commended

16. QUALIFICATIONS OF GUIDES FOR THE M.Phil COURSE

A Person eligible to be a Guide shall be required to possess a Ph.D. Degree or two years of Post-Graduate teaching experience after qualifying for M.Phil degree. He/ She should have obtained recognition from the University. Change of guide may be permitted as per University norms.

17. ATTENDANCE

Daily attendance for 90 working days should be enforced for the students. Periodical report of to a student to the guide concerned should be recorded in the register kept by the guide. The broad area for the dissertation may be finalized at the beginning of the M.Phil Programme, so that the collection of relevant literature and research design could be completed in the First semester leaving the entire for the research work.

18. COURSE STRUCTURE

Paper Code	Title of the Paper	Contact Hours	Marks	Credits
PART-I				
Paper-I	Research Methodology	10	100	6
Paper-II	Data Analytics	10	100	6
Paper-III	Field of Specialization	10	100	6
PART-II				
Paper-IV	Dissertation	-	100	18
TOTAL			400	36

PROGRAMME OUTCOMES (POs)

On completion of the Programme, the learner will be able to:

- PO 1** Apply professional al knowledge
- PO 2** Identify abilities to motivate the students
- PO 3** Design skills to guide and mentor the future generation
- PO 4** Acquire immense knowledge of the subject
- PO 5** Demonstrate high quality skills

PROGRAMME SPECIFIC OUTCOME (PSOs)

On completion of the specific programme Master of Computer Applications the student will be able to:

PSO 1	Identify, analyze and synthesize scholarly literature and tools relating to the field of computer science the literature relating to the field of computer science
PSO 2	Strengthen their knowledge on algorithms and algorithm design techniques
PSO 3	Understand the technological advances of computer technology and their usage.
PSO 4	Exposed to the techniques for presenting research papers in seminars and conferences
PSO 5	Use the knowledge in various domain to identify research gaps and provide solution to new ideas and innovation

END SEMESTER EVALUATION PATTERN – M.Phil.,

THEORY PAPERS SINGLE VALUATION BY EXTERNAL EXAMINERS

SINGLE VALUATION BY THE GUIDE FOR THE GUIDE PAPER

MAXIMUM MARKS : 100

PASSING MARK : 50

DISSERTATION : REPORT OF THE EXTERNAL EXAMINER

LIST OF ELECTIVES									
SE M	MAJOR / ELECTIVE	CODE	TITLE OF THE PAPER	CREDIT S	HOURS/ WK	TOTAL HOURS	CA	SE	TOTAL
	ELECTIVE	172003A	ADVANCED COMPUTER TECHNOLOGY	6	10	90		100	100
	ELECTIVE	172003B	EDUCATION & TECHNOLOGY	6	10	90		100	100
	ELECTIVE	172003C	PATTERN RECOGNITION	6	10	90		100	100
	ELECTIVE	172003D	ADVANCED APPROACHES IN ANALYZING UNSTRUCTURED DATA	6	10	90		100	100
	ELECTIVE	172003E	TEXT MINING AND BUSINESS INTELLIGENCE	6	10	90		100	100
	ELECTIVE	172003F	SOFTWARE QUALITY ASSURANCE	6	10	90		100	100
I	ELECTIVE	172003G	CRYPTOGRAPHY AND NETWORK SECURITY ESSENTIALS	6	10	90		100	100
	ELECTIVE	172003H	WEB DATAMINING	6	10	90		100	100
	ELECTIVE	172003I	INFORMATION SECURITY	6	10	90		100	100
	ELECTIVE	172003J	MACHINE LEARNING	6	10	90		100	100
	ELECTIVE	172003K	CLOUD COMPUTING	6	10	90		100	100
	ELECTIVE	172003L	SOFT COMPUTING	6	10	90		100	100
	ELECTIVE	172003M	INFORMATION RETRIEVAL	6	10	90		100	100
	ELECTIVE	172003N	KNOWLEDGE MANAGEMENT	6	10	90		100	100
	ELECTIVE	172003O	SECURITY IN COMPUTING	6	10	90		100	100
	ELECTIVE	172003P	KNOWLEDGE MINING	6	10	90		100	100

RESEARCH METHODOLOGY

TOTAL HOURS: 90hrs

COURSE CODE: 172001

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To study the meaning of Research and its methods.
2. To study and develop the reading techniques of Journals and focused on Research design.
3. To study the concepts of collection of data - methods and techniques, provides guidelines for questionnaire and Interviewing.
4. To study the Report writing and the presentation.
5. To study the Writing methods for preparation of Tables, Figures, Summary and Synopsis.

COURSE OUTLINE

UNIT I

17 hrs

Research Methodology: An introduction – Meaning of Research – Objectives of Research – Motivation in Research – Types of Research – Research Approaches – Significance of Research – Research methods versus methodology - Research and Scientific Method – Importance of knowing how Research is done – Research process – Criteria for good Research – Problems encountered by Researchers in India.

UNIT II

20 hrs

Journal Reading Techniques - Defining the Research problem – What is the Research Problem – Selecting the Problem – Necessity of Defining the problem – Technique involved in Defining the Problem – An illustration – Conclusion. Research Design – Need for Research Design – Features of good design – Important concepts relating to Research Design – Different Research Design – Basic principles of Experimental Designs – Conclusion – Developing a Research Plan.

UNIT III

18 hrs

Methods of Data Collection – Collection of primary data – Collection of data through questionnaires – Schedules – Differentiation between questionnaires and schedules – Other methods of data collection – Collection of secondary data – Selection of appropriate method for data collection–Guidelines for constructing questionnaire/Schedule–Guidelines for successful Interviewing – Difference between survey and experiment – Data Collection using Journals.

UNIT IV

17 hrs

Significance of Report Writing – Different steps in writing Report – Layout of the Research Report – Types of Reports – Oral presentation – Mechanics of writing a Research Report – Precautions for writing a Research Reports – Conclusions.

UNIT V

18 hrs

Thesis Writing and Paper Presentation: Writing Materials and Methods- Writing Results- Preparation of Tables- Preparation of figures- writing discussion- Writing Abstract, Summary and Synopsis.

RECOMMENDED TEXTBOOKS:

1. C.R. Kothari. “Research Methodology – Methods and Techniques”, 2nd Edition, New Delhi: New Age International (P) Limited, 2003.
2. N. Gurmani. “Scientific Thesis Writing and Paper Presentation”, MJP Publication

REFERENCE BOOKS:

1. Eileen M. Trauth. “Qualitative Research in IS: Issues & Trends”, USA/London: IDEA Group Publishing, 2001. (ISBN: 1-930708-06-08)
2. www.dcs.gla.ac.uk/~johnson/teaching/research_skills/research.html
3. <http://www.csc.liv.ac.uk/~ullrich/COMP516>
4. Dr. Vijay Upagade, Dr.ArvindShende, “Research Methodology” Revised Edition, S.Chand Publication
5. R. Paneerselvam, “Research Methodology” 2nd Edition, PHI Publication.

JOURNALS:

1. [Journal of Fundamentals of research methodology and data collection](#)
2. **Journal of Students' Developing Knowledge in a Subject Discipline: Insights from combining Quantitative and Qualitative Methods**

E-LEARNING RESOURCES:

1. https://www.researchgate.net/publication/323833808_Significance_of_Research_in_Education
2. https://www.researchgate.net/publication/308262064_Research_Design
3. https://shodhganga.inflibnet.ac.in/bitstream/10603/3704/12/12_chapter%202.pdf
4. http://content.inflibnet.ac.in/data-server/eacharya-documents/5717528c8ae36ce69422587d_INFIEP_304/181/ET/304-181-ET-V1-S1__file1.pdf
5. <https://shodhganga.inflibnet.ac.in/bitstream/10603/25041/6/c3.pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Identify and apply the basic concepts of methods of Research
CO 2	Develop the important strategies of reading techniques of journals and strengthen the research design
CO 3	Expose the techniques of data collection and for preparation of questionnaire and interviewing
CO 4	Understand the techniques of Report writing and for presentation
CO 5	Knowledge of writing methods provides innovative ideas for preparing the summary and synopsis

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk)

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

DATA ANALYTICS

TOTAL HOURS: 90 hrs
172002

COURSE CODE:

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To understand the concepts of handling the complex and big data in various applications.
2. To study the various methods of Descriptive and Inferential Statistics.
3. To study the strategies of Machine Learning.
4. To study the various analysis and approaches of Supervised Learning with Regression and Classification.
5. To understand the concepts of UnSupervised Learning.

COURSE OUTLINE

Unit I - Empirical investigation of complex data 15

hrs

Essential practical familiarization with complex and big data. Typical challenges with real business data. Basics on data acquisition, manipulation, cleaning, filtering, representation and plotting.

Unit II - Descriptive Statistics & Inferential Statistics 15

hrs

Introduction to the course - Descriptive Statistics - Probability Distributions - Inferential Statistics through hypothesis tests - Permutation & Randomization Test

Unit III - Machine Learning: Introduction and Concepts 15

hrs

Differentiating algorithmic and model based frameworks - Regression : Ordinary Least Squares, Ridge Regression, Lasso Regression - K Nearest Neighbours Regression & Classification

Unit IV - Supervised Learning with Regression and Classification techniques

20

hrs

Bias-Variance Dichotomy - Model Validation Approaches - Logistic Regression - Linear Discriminant Analysis - Quadratic Discriminant Analysis - Regression and Classification Trees - Support Vector Machines - Ensemble Methods: Random Forest - Neural Networks -Deep learning

hrs

Clustering - Associative Rule Mining - Challenges for big data analytics

RECOMMENDED TEXTBOOKS:

1. E Turban, R Sharda, D Delen Decision support and business intelligence systems - Indian Edition – Dorling Kindersley (India) Pvt. Ltd. 2011.
2. Hastie, Trevor, et al. The elements of statistical learning. Vol. 2. No. 1. New York: springer, 2009.

REFERENCE BOOKS:

1. Montgomery, Douglas C., and George C. Runger. Applied statistics and probability for engineers. John Wiley & Sons, 2010
2. Dunlop, Dorothy D., and Ajit C. Tamhane. Statistics and data analysis: from elementary to intermediate. Prentice Hall, 2000.
3. G Casella and RL Berger, Statistical Inference, Thomson Learning 2002.
Newman “Networks: an introduction”, Oxford University Press
4. Mayer-Schönberger, Viktor, and Kenneth Cukier. Big data: A revolution that will transform how we live, work, and think. Houghton Mifflin Harcourt, 2013.
5. Silver, Nate. The signal and the noise: Why so many predictions fail-but some don't. Penguin, 2012.

JOURNALS:

1. [Journal of Big Data](#)
2. [Unsupervised Feature Learning on Big Data Based on Deep Learning with Weighted Softmax Regression](#)

E-LEARNING RESOURCES:

1. <https://www.digitalocean.com/community/tutorials/an-introduction-to-big-data-concepts-and-terminology>
2. <https://statisticsbyjim.com/basics/descriptive-inferential-statistics/>
3. www.it.uu.se › *edu* › *course* › *homepage* › *sml* › *literature* › *lecture_notes*
4. <http://cs229.stanford.edu/notes/cs229-notes1>
5. <https://data-flair.training> › Blog Home › Machine Learning Tutorials

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Identify , analyze the complex and Big Data in various applications by referring the literatures relating to the field of computer science.
CO 2	Strength the knowledge of various mathematical methods of Descriptive and Inferential Statistics.
CO 3	Understand the various techniques of Machine Learning system and their usage.
CO 4	Exposed to evaluate Big Data in applications and apply Supervised Learning with Regression and Classification.
CO 5	Strengthen the Knowledge of UnSupervised Learning that emphasis to design and provide solutions to the new ideas in Big Data analysis and innovative to research areas.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk)

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

ADVANCED COMPUTER TECHNOLOGY

TOTAL HOURS: 90 Hrs.

COURSE CODE: 172003A

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To study about security issues in Databases and Networks.
2. To study about Grid computing technologies
3. To study about shared memory and synchronization.
4. To study about Distributed Databases.
5. To study about Parallel processing and Microprocessors.

COURSE OUTLINE

UNIT I

20hrs

Security problems in Computing – Cryptography – program security – Database security – Security in Networks

UNIT II

20hrs

Grid Computing organization and their role – Grid computing anatomy – Merging the Grid service architecture with web services architecture

UNIT III

15hrs

Fundamental – Remote procedure calls – Distributed shared memory – Synchronization

UNIT IV

20hrs

Distributed Databases – Homogeneous and Heterogeneous databases – Distributed data storage – distributed transactions – commit protocols – concurrent control – availability – Distributed theory processing Heterogeneous distributed databases – Directory systems

UNIT V

15hrs

Fundamentals of Parallel processing – MIMD computers or Multiprocessor 4.1 – 4.2, 4.3

RECOMMENDED TEXTBOOKS:

1. Chapter 1,2,3,6 & 7 – (Security in Computing, Charles P. Pfleeger, & Shani Lawrence Pfleeger)
2. Joshy Joseph, GraigFelenstern „Grid Computing“ – Pearsons 2004
3. Distributed File Systems: Distributed Computing Architecture Book by Neal Kobel.
4. Abraham fiberschatz& Hendry F. Korths “Data base systems concepts” Mc Graw Hill International fifth edition, 2006

REFERENCE BOOKS:

1. Distributed Operating Systems, Pradeep K. Sinha, PHI, 2004

2. Distributed memory multiprocessors 5.1, 5.2, 5.3, 5.4, 5.5
3. Data dependence and parallelism – 7.1 – 7.2, 7.3, 7.4, 7.5
4. Implementing synchronization and data sharing 8.1, 8.2, 8.3, 8.4 Harry F. Jordan
Gita Alaghband.
5. Algorithms and Parallel Computing by Fayez Gebali Publisher: John Wiley & Sons

JOURNALS:

1. <https://link.springer.com>
2. <https://www.journals.elsevier.com>

E-LEARNING RESOURCES:

1. <https://ieeexplore.ieee.org>
2. <https://www.tutorialspoint.com>
3. <https://globaljournals.org>
4. <https://www.classcentral.com>
5. <https://www.udacity.com>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Review the fundamental concepts of Security issues in Databases and Networks
CO 2	Analyze Grid computing technologies.
CO 3	Evaluate the techniques of Remote procedure calls and Synchronization.
CO 4	Review the fundamentals of Distributed databases.
CO 5	Interpret Parallel processing.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	2
AVERAGE	3	1.8	1.8	2.4	2.4

KEY: **STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0**

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

EDUCATION & TECHNOLOGY

TOTAL HOURS: 90 Hrs.

COURSE CODE: 172003B

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To study the ICT methods in class rooms.
2. To study the fundamentals of communication skills
3. To study about communication technologies and its uses.
4. To study about teaching pedagogy.
5. To learn about Teaching skills.

COURSE OUTLINE

UNIT I

20hrs

Computer Application Skills : Computer system: Characteristics, Parts and their functions – Different generations of Computer – Operation of Computer: switching on / off / restart, Mouse control, Use of key board and some functions of key – Information and Communication Technology (ICT): Definition, Meaning, Features, Trends – Integration of ICT in teaching and learning – ICT applications: Using word processors, spread sheets, Power point slides in the classroom – ICT for Research: On-line journals, e-books, Courseware, Tutorials, Technical reports, Theses and Dissertations

UNIT II

20hrs

Communication Skills : Communication: Definitions – Elements of Communication: Sender, Message, Channel, Receiver, Feedback and Noise – Types of Communication: Spoken and written; Non-verbal communication – Intrapersonal, Interpersonal, Group and Mass communication – Barriers to communication: Mechanical, Physical, Linguistic & Cultural – Skills of communication: Listening, Speaking, Reading and writing – Methods of developing fluency in oral and written communication – style, Diction and Vocabulary – Classroom communication and dynamics

UNIT III

15hrs

Communication Technology: Communication Technology: Bases, Trends and Developments – Skills of using Communication Technology – Computer Mediated Teaching: Multimedia, E-content – Satellite-based communication: EDUSAT and ETV channels, Communication through web: Audio and Video applications on the Internet, interpersonal communication through the web.

UNIT IV

20hrs

Pedagogy : Instructional Technology: Definition, Objectives and Types – Difference between Teaching and Instruction – Lecture Technique: Steps, Planning of a Lecture, Delivery of a lecture – Narration in tune with the nature of different disciplines – Lecture with power point presentation – Versatility of lecture technique – Demonstration, Characteristics, Principles, Planning Implementation and Evaluation – Teaching – Learning Techniques: Team Teaching, Group discussion, Seminar, Workshop, Symposium and Panel Discussion – Models of teaching: CAI, CMI and WBI

UNIT V

15hrs

Teaching Skills : Teaching skill: Definition, Meaning and Nature – Types of Teaching skills: Skill of Set Induction, Skill of Stimulus Variation, Skill of Explaining, Skill of Probing Questions, Skill of Black Board writing and Skill of Closure – Integration of Teaching Skills – Evaluation of Teaching Skills

RECOMMENDED TEXTBOOKS:

1. Bela Rani Sharma (2007), Curriculum Reforms and Teaching Methods, Sarup and sons, New Delhi
2. Don Skinner (2005), Teacher Training, Edinburgh University Press Ltd., Edinburgh
3. Information and Communication Technology in Education: A Curriculum for Schools and programme of Teacher development, Jonathan Anderson and Tom Van Weert, UNESCO, 2002.
4. Kumar K.I (2008) Educational Technology, New Age International Publishers, New Delhi
5. Mangal, S.K. (2002) Essential of Teaching – Learning and Information Technology, Tandon Publications, Ludhiana

REFERENCE BOOKS:

1. Michael D. and William (2000), Integrating Technology into Teaching and Learning: Concepts and Applications, Prentice Hall, New York
2. Pandey S.K. (2005) Teaching Communication, Commonwealth Publishers, New Delhi
3. Ram Babu A. and Dandapani S (2006) Microteaching (Vol.1&2) Neelakamal Publications, Hyderabad
4. Singh V.K. and Sudarshan K.N. (1996) Computer Education, Discovery Publishing Company, New York
5. Sharma R. A. (2006) Fundamentals of Educational Technology, Surya Publications, Meerut
6. Vanaja. M. and Rajasekar S. (2006) Computer Education, Neelkamal Publications, Hyderabad.

JOURNALS:

1. <https://journals.sagepub.com>
2. <http://www.sciedu.ca/journal/index.php>

E-LEARNING RESOURCES:

1. <https://uncw.edu/jet/>
2. <https://www.teachermagazine.com.au/>
3. <https://www.griffith.ie/faculties/springboard/what-are-ict-skills>
4. https://swayam.gov.in/nd2_cec19_ed10/preview
5. <https://education.gov.gy/web/index.php/teachers/tips-for-teaching>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Review the fundamental concepts ICT methods.
CO 2	Analyze communication skills for class room.

CO 3	Evaluate the communication technologies and E-contents.
CO 4	Categorize various pedagogical techniques.
CO 5	Interpret various teaching skills.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	2
CO2	3	2	3	3	3
CO3	3	3	2	3	3
CO4	3	2	2	3	3
CO5	3	2	2	2	3
AVERAGE	3	2.2	2.2	2.6	2.8

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

PATTERN RECOGNITION

TOTAL HOURS: 90 hrs
172003C

COURSE CODE:

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To study the life cycle and basic features of Pattern Recognition.
2. To study the Bayes Decision Theory for estimating the patterns.
3. To understand the various methods of Clustering.
4. To emphasis the student to understand the Component analysis strategies for representing the Patterns in various applications
5. To study and implement the Hidden Markov model for Pattern Recognition.

COURSE OUTLINE

UNIT I

20 hrs

Introduction: Machine perception, pattern recognition example, pattern recognition systems, the design cycle, learning and adaptation (Text book-1, p.nos: 1-17).

Bayesian Decision Theory: Introduction, continuous features – two categories classifications, minimum error-rate classification- zero–one loss function, classifiers, discriminate functions, and decision surfaces (Text Book, p.nos: 20-27, 29-31).

UNIT II

15 hrs

Normal density : Univariate and multivariate density, discriminate functions for the normal density different cases, Bayes decision theory – discrete features, compound Bayesian decision theory and context (Text book-1, p.nos: 31-45,51-54,62-63).

Maximum likelihood and Bayesian parameter estimation : Introduction, maximum likelihood estimation, Bayesian estimation, Bayesian parameter estimation–Gaussian case (Text book-1, p.nos: 84-97).

UNIT III

15 hrs

Un-supervised learning and clustering: Introduction, mixture densities and identifiability, maximum likelihood estimates, application to normal mixtures, K-means clustering. Data description and clustering – similarity measures, criteria function for clustering (Text book-1, p.nos: 517 – 526, 537 – 546).

UNIT IV

15 hrs

Component analyses : Principal component analysis, non-linear component analysis; Low dimensional representations and multi dimensional scaling (Text book-1, p.nos: 568-570,573 – 576,580-581).

UNIT V

25 hrs

Discrete Hidden Markov Models: Introduction, Discrete-time markov process, extensions to hidden Markov models, three basic problems for HMMs. (Text book -2, p.nos: 321 – 344)
Continuous hidden Markov models : Observation densities, training and testing with continuous HMMs, types of HMMs. (Text book-2, p.nos: 348 – 352)

RECOMMENDED TEXTBOOKS:

1. Pattern classifications, Richard O. Duda, Peter E. Hart, David G. Stroke. Wiley student edition, Second Edition, 2001.
2. Fundamentals of speech Recognition, Lawrence Rabiner, Biing – Hwang Juang Pearson education, 1993.

REFERENCE BOOKS:

1. Pattern Recognition and Image Analysis – Earl Gose, Richard John baugh, Steve Jost PHI 2004
2. Markov models for Pattern Recognition – Gernot A Fink 2nd edition 2014 .
3. Data Clustering C.Aggarwal and ChandanK.Reddy
4. Pattern Recognition J.P Marquesde
5. Pattern Recognition – Statistical, Structural and Neural Approaches Robert Schalkoff

JOURNALS:

1. International Journal of Advanced Research in Computer Science and Software Engineering
Classification - Classification in Pattern Recognition: A Review
2. An Introduction to Hidden Markov Models and Bayesian Networks.

E-LEARNING RESOURCES:

1. <https://www.geeksforgeeks.org/pattern-recognition-introduction>
2. http://research.cs.tamu.edu/prism/lectures/pr_16
3. <https://www.analyticsvidhya.com/clustering>
4. <https://towardsdatascience.com/introduction-to-principle-component-anal...>
5. <http://jedlik.phy.bme.hu/~gerjanos/HMM/node4>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Analyze the basic ideas to understand the Patterns in applications by referring the literatures related to the field of computer science.
CO 2	Design and gain knowledge on patterns estimation using Bayes Decision theory.
CO 3	Understand and implement the various techniques of Clustering for Classification.
CO 4	Exposed to evaluate and represent the Patterns in Component analysis.
CO 5	Apply and design a model for Pattern Recognition using Hidden Markov model and gain knowledge to provide solutions to new ideas and innovative in research areas.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk)

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

ADVANCED APPROACHES IN ANALYZING UNSTRUCTURED DATA

TOTAL HOURS: 90Hrs.
172003D

COURSE CODE:

CREDITS:6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To study the text mining fundamentals and pre-processing techniques.
2. To study the machine learning and clustering algorithms.
3. To study information extraction architecture and algorithms.
4. To study the probabilistic model of information extraction.
5. To study and implement applications and case studies of text mining.

COURSE OUTLINE

UNIT I 15 Hrs.

Introduction to Text Mining-General Architecture of Text Mining Systems-Core Text Mining Operations-Text Mining Preprocessing Techniques: Task-Oriented Approaches.

UNIT II 15 Hrs.

Categorization: Applications – Definition – Document Representation-Knowledge Engineering Approach- Machine Learning Approach-Evaluation of Text Classifiers. Clustering: Clustering-Tasks in Text Analysis-Clustering Algorithms-Clustering of Textual Data.

UNIT III 15 Hrs.

Information Extraction: Introduction-IE Examples-Architecture of IE Systems-Anaphora Resolution-Inductive Algorithms- Structural Information Extraction.

UNIT IV 15 Hrs.

Probabilistic Models of Information Extraction: Hidden Markov Models - Stochastic Context-Free Grammars-Maximal Entropy Modeling-Maximal Entropy Markov Models-Conditional Random Fields.

UNIT V 30 Hrs.

Preprocessing Applications, Presentation Layer: Browsing – Query Refinement, Visualization Approaches, Text Mining Applications – Case Studies.

RECOMMENDED TEXTBOOKS:

1. Ronen Feldman and James Sanger, The Text Mining Handbook – Advanced Approaches in Analyzing Unstructured Data, Cambridge University Press, 2006
2. Sholom M. Weiss, Nitin Indurkha, Tong Zhang, Fred J. Damerau, "Text Mining – Predictive Methods for Analyzing Unstructured Information", Springer International Edition, 2010

REFERENCE BOOKS:

1. Jiawei Han and Micheline Kamber, Data Mining: Concepts and Techniques, 2nd edition, Morgan Kaufmann Publishers, Second Edition, 2010
2. Michael W. Berry, Survey of Text Mining – Clustering, Classification and Retrieval, Springer International Edition
3. Gerald J. Kowalski, Mark T. Maybury, Information Storage and Retrieval System – Theory and Implementation, Second Edition, Springer International Edition, 2012
4. Margaret H. Dunham, Pearson Education, Data Mining: Introductory and Advanced Topics, 2004
5. Efraim Turban, Ramesh Sharda, Dursun Delen, "Decision Support and Business Intelligence systems", Pearson, 9th Edition, 2014

JOURNALS:

1. International Journal of Information Retrieval
2. International Journal of Innovative Technology and Exploring Engineering

E-LEARNING RESOURCES:

1. <https://www.slideshare.net/kanimozhiu/text-data-mining1>
2. https://www.cse.iitb.ac.in/~cs725/notes/classNotes/extra_lecturenotes_cs725.pdf
3. <https://www.slideshare.net/BAIRAVIT/information-retrieval-systems-notes>
4. <https://www.slideshare.net/shivangisaxena566/hidden-markov-model-ppt>
5. <https://www.elderresearch.com/company/resource-center/case-studies/topic/text-mining>

COURSE OUTCOMES:

CO Number	CO STATEMENT

CO 1	Review the fundamental concepts of text mining fundamentals and pre-processing techniques.
CO 2	Analyze machine learning and clustering algorithms.
CO 3	Strengthen the knowledge in information extraction.
CO 4	Identifying the probabilistic model of information extraction.
CO 5	Use the knowledge and identify research gap text mining domain.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	3	3	3	3
AVERAGE	3	2.2	2.2	2.6	2.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

TEXT MINING AND BUSINESS INTELLIGENCE

TOTAL HOURS: 90Hrs.

COURSE CODE: 172003E

CREDITS:6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To study the text mining fundamentals and vector formation of textual information.
2. To analyze the prediction techniques and finding structure in a document collection.
3. To gain knowledge of business intelligence framework and procedures.
4. To study the text mining tools.
5. To study and implement case studies on text mining.

COURSE OUTLINE

UNIT I 15 Hrs.

Overview of Text Mining: Document Classification, Information Retrieval, Clustering and Organizing Documents, Information Extraction, Prediction and Evaluation - From Textual Information to Numerical vectors

UNIT II 15 Hrs.

Using Text for Prediction - Information Retrieval and Text Mining - Finding Structure in a Document Collection - Looking for Information in Documents - Case studies

UNIT III 15 Hrs.

Business Intelligence: Framework for Computerized Decision Support - Concept of Decision Support Systems - Framework of Business Intelligence - Decision Making: Introduction and Definitions - Models and Phases of Decision making process - Components of Decision Support Systems

UNIT IV 15 Hrs.

Study of Text mining tools

UNIT V 30 Hrs.

Case study using Text Mining tools and techniques

RECOMMENDED TEXTBOOKS:

1. Sholom M. Weiss, Nitin Indurkha, Tong Zhang, Fred J. Damerau, "Text Mining – Predictive Methods for Analyzing Unstructured Information", Springer International Edition, 2010
2. Efraim Turban, Ramesh Sharda, Dursun Delen, "Decision Support and Business Intelligence systems", Pearson, 9th Edition, 2014

REFERENCE BOOKS:

1. Michael W. Berry, Survey of Text Mining – Clustering, Classification and Retrieval, Springer International Edition
2. Gerald J. Kowalski, Mark T. Maybury, Information Storage and Retrieval System – Theory and Implementation, Second Edition, Springer International Edition, 2012

3.Ronen Feldman and James Sanger, The Text Mining Handbook – Advanced Approached in Analyzing Unstructured Data, Cambridge University Press, 2006

4.Jiawei Han and Micheline Kamber, Data Mining: Concepts and Techniques, 2nd edition, Morgan Kaufmann Publishers, Second Edition, 2010

5.MargaretH.Dunham, Data Mining: Introductory and Advanced Topics, PearsonEducation 2004

JOURNALS:

1.International Journal of Information Retrieval

2. International Journal of Innovative Technology and Exploring Engineering

E-LEARNING RESOURCES:

1.<https://www.slideshare.net/kanimozhiu/text-data-mining1>

2.<https://machinelearningmastery.com/gentle-introduction-bag-words-model/>

3.<https://www.guru99.com/business-intelligence-definition-example.html>

4.<https://www.predictiveanalyticstoday.com/top-free-software-for-text-analysis-text-mining-text-analytics/>

5.<https://www.elderresearch.com/company/resource-center/case-studies/topic/text-mining>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Review the fundamental concepts of text mining and vector formation of textual information
CO 2	Analyze the prediction techniques and finding structure in a document collection.
CO 3	Strengthen the knowledge in decision support systems.
CO 4	Identifying the appropriate tool for text mining.
CO 5	Use the knowledge and identify research gap text mining domain.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	3	3	3	3

AVERAGE	3	2.2	2.2	2.6	2.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

SOFTWARE QUALITY ASSURANCE

TOTAL HOURS: 90 Hrs.

COURSE CODE: 172003F

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To understand the challenges, factors, components of software quality assurance.
2. To learn the basics of software testing and to know the various models of testing.
3. To study the different types of testing.
4. To learn about the metrics of software quality.
5. To understand the role of management in software quality assurance.

COURSE OUTLINE

UNIT I

15 Hrs.

Introduction to software quality - challenges – objectives – quality factors – components of SQA – contract review – development and quality plans – SQA components in project life cycle – SQA defect removal policies – Reviews

UNIT II

15 Hrs.

Basics of software testing – test generation from requirements – finite state models – combinatorial designs - test selection, minimization and prioritization for regression testing – test adequacy, assessment and enhancement

UNIT III

20 Hrs.

Testing strategies – white box and black box approach – integration testing – system and acceptance testing – performance testing – regression testing – internationalization testing – ad-hoc testing – website testing – usability testing – accessibility testing Test plan – management – execution and reporting – software test automation – automated testing tools.

UNIT IV

20 Hrs.

Hierarchical models of software quality – software quality metrics –function points -Software product quality – software maintenance quality – effect of case tools – software quality infrastructure – procedures – certifications – configuration management –documentation control.

UNIT V

20 Hrs.

Project progress control – costs – quality management standards – project process standards – management and its role in SQA – SQA unit.

RECOMMENDED TEXTBOOKS:

1. Daniel Galin, “Software quality assurance – from theory to Implementation”, Pearson education, 2009.
2. Aditya Mathur, “Foundations of software testing”, Pearson Education, 2008

REFERENCE BOOKS:

1. Srinivasan Desikan and Gopalaswamy Ramesh, “Software testing – principles and practices”, Pearson education, 2006
2. Ron Patton, “Software testing , second edition”, Pearson education, 2007
3. Alan C Gillies, “Software Quality Theory and Management”, Cengage Learning, Second edition, 2003
4. Kshirasagar Naik and Priyadarshi Tripathy, “Software Testing and Quality Assurance: Theory and Practice”, Nirali Prakasan, 2008
5. Schulmeyer. G, “Handbook of Software Quality Assurance”, Prentice Hall, 1999

JOURNALS:

1. International Journal of Quality & Reliability Management
2. International Journal of Engineering and Computer Science

E-LEARNING RESOURCES:

1. <https://cms.laxmi.edu.in/docs/syllabus/3650011.pdf>
2. https://magnegaresh.ir/wp-content/uploads/2017/01/Fundamentals-of-Software-Testing_www.itba_.ir_.pdf
3. http://www.cs.iit.edu/~oaldawud/Slides/Class9_SW_Testing_Strategies.pdf
4. <http://sunnyday.mit.edu/16.355/metrics.pdf>
5. <http://osp.mans.edu.eg/elbeltagi/CM%20P%20Prgress%20Control.pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Apply the fundamentals of software quality assurance in software projects.
CO 2	Apply the learning of software testing methods in software development projects.
CO 3	Apply the learning of the various categories of testing and software testing tools in software development.
CO 4	Explain the importance of the quality metrics, function points and configuration management in a project life cycle.
CO 5	Understand and apply the role of management in software quality assurance.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	3	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	2	2.4	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture by Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any

K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

CRYPTOGRAPHY AND NETWORK SECURITY ESSENTIALS

TOTAL HOURS : 90 hrs

COURSE CODE: 172003G

CREDITS : 6

L-T-P : 6-0-0

COURSE OBJECTIVES:

The research student to

1. To know the Security Concepts, model and Security Services
2. To understand the concepts of conventional encryption and methods of public key encryption.
3. To learn Applications of Cryptographic Hash functions and Message Authentication Schemes.
4. To understand the network security considerations, layer and protocols to provide security.
5. To know the internet security at system level and understand security policies used.

COURSE OUTLINE:

UNIT I

10 Hrs.

Introduction: Computer Security Concepts-The OSI Security Architecture-Security Attacks-Security Services-Security Mechanisms-A Model for Network Security - Symmetric Cipher model-Substitution Techniques-Transposition Techniques-Rotor Machines- Steganography.

UNIT II

20 Hrs.

Block cipher Principles- The Data Encryption Standard (DES)-A DES Example- the Strength of DES -Asymmetric Ciphers -Principles of public - Key Cryptosystems- RSA Algorithm-Diffie-Hellman Key Exchange- Elgamal Cryptographic System.

UNIT III

20 Hrs.

Cryptographic Hash functions: Applications of Cryptographic Hash functions-Two Simple Hash Functions-Requirements and Security - Message Authentication Requirements - Message Authentication Functions- Requirements for message Authentication Codes- Security of MACs - Digital signatures- Elgamal Digital Signature Scheme.

UNIT IV

20 Hrs.

Network Security: Web security considerations- Secure socket layer and Transport layer security-Transport layer security-HTTPS-Secure Shell (SSH) - Wireless Network Security-Wireless Application Protocol Overview-Wireless Transport Layer Security-WAP End-to-End Security -IP Security - IP Security Overview- IP Security Policy-Encapsulating Security Payload-Combining Security Associations- Internet Key Exchange-Cryptographic Suites.

UNIT V

20 Hrs.

System Security: Intruders- Intrusion detection- Password management - Malicious Software -Types of malicious software- Viruses- Virus Counter measures-worms- DDOS attacks – Firewalls - Need for firewalls- Firewall characteristics - Types of firewall - Firewall basing- Firewall location and configuration.

RECOMMENDED TEXTBOOKS:

1. William Stallings, “Cryptography And Network Security – Principles and Practices”, Pearson, Sixth Edition, 2015.
2. AtulKahate, “Cryptography and Network Security”, Tata McGraw-Hill, 2013.

REFERENCE BOOKS:

1. Bruce Schneier, “Applied Cryptography”, John Wiley & Sons Inc, 2011.
2. Charles B. Pfleeger, Shari Lawrence Pfleeger, “Security in Computing”, Third Edition, Pearson Education, 2013.
3. William Stallings, “Network Security Essentials: Applications and Standards”, Pearson Publications, 4th Edition , 2011.
4. BehrouzForouzon, “Cryptography and Network Security”, MC Graw- Hill Edition, 2010.

5. Prakash C. Gupta, Cryptography and Network Security, PHI Learning; 1 Edition (Nov2014)

JOURNALS:

1. <https://wireilla.com/ijcis/index.html>
2. <https://ieeexplore.ieee.org/document/4646371/>

E-LEARNING RESOURCES:

1. <https://freevidelectures.com/course/5027/cryptography-and-network-security>
2. <https://www.coursera.org/lecture/cryptography/public-key-encryption-40Sb3>
3. <https://www.coursera.org/learn/asymmetric-crypto>
4. <https://www.udacity.com/course/applied-cryptography--cs387>
5. <https://www.journals.elsevier.com/network-security>

COURS OUTCOMES:

CO No.	CO Statements
CO 1	Impart knowledge on Encryption techniques, Design Principles and Modes of Operation
CO 2	Design a security solution for a given application using the Data Encryption Standard (DES) and Key Management techniques.
CO 3	Create an understanding of Authentication functions the manner in which Message Authentication Codes and Hash Functions works.
CO 4	Understanding Network, IP and Web security considerations and Protocols.
CO 5	Examine the issues in System security and Electronic Mail Security

MAPPING-CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	3
CO 2	2	3	2	3	3
CO 3	2	2	2	3	3
CO 4	3	2	3	3	2
CO 5	3	3	3	3	3
Average	2.4	2.4	2.6	2.8	2.8

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture by chalk and talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

WEB DATA MINING

TOTAL HOURS: 90 Hrs

COURSE CODE: 172003H

CREDITS: 6

L-T-P:6-0-0

COURSE OBJECTIVES:

- 1.To focus on data mining process and techniques.
2. To acquire the knowledge about supervised learning and unsupervised learning
- 3.To understand the basics of information retrieval and web search.
4. To appreciate the role of hyper links in for web usage mining.
5. To understand about opinion mining.

COURSE OUTLINE

UNIT I

15 Hrs.

Introduction: world wide web-web and the Internet-Web Data Mining-Association Rules and Sequential Patterns: Basics Concepts of Association Rules-Apriori Algorithm-Data Formats for Association Rule Mining-Mining with Multiple Minimum Supports-Mining Class Association Rules-Basic Concepts of Sequential Patterns-Mining Sequential Patterns Based on GSP-Mining Sequential Patterns Based on Prefix Span-Generating Rules from Sequential Patterns.

UNIT II

20 Hrs.

Supervised Learning: Basic Concepts-Decision Tree Induction-Classifer Evaluation-Rule Induction-Classification Based on Associations-Naïve Bayesian Classification-Naïve Bayesian Text Classification-Support Vector Machines-K-Nearest Neighbor Learning-Ensemble of Classifiers. Unsupervised Learning: Basic Concepts-K-means Clustering-Representation of Clusters-Hierarchical Clustering-Distance Functions-Data Standardization-Handling of Mixed Attributes- Clustering Algorithm -Cluster Evaluation-Discovering Holes and Data Regions. Partially Supervised Learning: Learning from Labeled and Unlabeled Examples-Learning from Positive and Unlabeled Examples.

UNIT III

20 Hrs.

Information Retrieval and Web Search: Basic Concepts of Information Retrieval-Information Retrieval Models-Relevance Feedback-Evaluation Measures-Text and Web Page Pre-Processing-Inverted Index and its Compression-Latent Semantic Indexing-Web Search-Meta-Search: Combining Multiple Rankings-Web Spamming. Link Analysis: Social Network Analysis-Co-Citation and Bibliographic Coupling-PageRank-HITS-Community discovery-Web Crawling: A Basic Crawler Algorithm-Implementation Issues-Universal Crawlers-Focused Crawlers-Topical Crawlers-Evaluation-Crawler Ethics and Conflicts- New Developments.

UNIT IV

20 Hrs.

Structured Data Extraction: Wrapper Generation--- Preliminaries-Wrapper Induction-Instance-Based Wrapper Learning- Automatic Wrapper Generation: Problems- String Matching and Tree Matching-Multiple Alignment-Building DOM Trees- Extraction Based on a Single List Page: Flat Data Records- Extraction Based on a Single List Page: Nested Data

Records- Extraction Based on Multiple Pages-Some Other Issues. Information Integration: Introduction to Schema Matching- Pre-Processing for Schema Matching- Schema-Level Matching- Domain and Instance-Level Matching- Combining Similarities-Issues-Integration of Web Query Interfaces- Constructing a Unified Global Query Interface.

UNIT V

15 Hrs.

Opinion Mining: Sentiment Classification-Feature-Based Opinion Mining and summarization- Comparative Sentence and Relation Mining-Opinion Search-Opinion Spam- Web Usage Mining: Data Collection and Pre-Processing- Data Modeling for Web Usage Mining- Discovery and Analysis of Web Usage Patterns-study of web mining tools-case study.

RECOMMENDED TEXTBOOKS:

1. Bing Liu, Web Data Mining, Springer International Edition, 2015.
2. SholomM.Weiss, Nitin Indurkha, Tong Zhang, Fred J.Damerau, Text Mining, Springer International Edition, 2010

REFERENCE BOOKS:

1. Thomas A.Powell, Web Design: The Complete Reference, Second Edition, Tata McGraw Hill, 2012.
2. Jiawei Han, Micheline Kamber, Data Mining: Concepts and Techniques, Second Edition, Elsevier Publications, 2010.
3. Anthony Scime, Web Mining : Applications and Techniques, Idea Group Publishing, 2005.
4. Kowalski, Gerald, Mark T Maybury: Information Retrieval Systems: Theory and Implementation, Kluwer Academic Press, 1997.
5. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.

JOURNALS:

1. Journal of Information Science
2. Journal of Computer Research and Development

E-LEARNING RESOURCES:

1. <http://www.web-datamining.net/tools/>
2. https://link.springer.com/chapter/10.1007/3-540-48298-9_32
3. https://link.springer.com/chapter/10.1007/978-3-540-72079-9_3
4. <https://www.sciencedirect.com/science/article/abs/pii/S1570826816000020>
5. <https://link.springer.com/article/10.1007/BF03325089>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Analyze the concepts of web data mining
CO 2	Modify an existing search engine to make it personalized.
CO 3	Apply hyper links in for web usage mining.
CO 4	Design system to get information available on the web.
CO 5	Analyze social media data using appropriate web mining technique.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	3	2	3	2	2
CO 2	3	2	2	3	3
CO 3	3	3	3	3	3
CO 4	3	3	3	3	3
CO 5	3	3	3	3	3
AVERAGE	3	2.6	2.8	2.8	2.8

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

INFORMATION SECURITY

TOTAL HOURS: 90 Hrs.

COURSE CODE: 172003I

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To provide an understanding of principal concepts, major issues, technologies and basic approaches in information security.
2. Develop an understanding of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.
3. Gain familiarity with prevalent network and distributed system attacks, defenses against them and forensics to investigate the aftermath.
4. Develop a basic understanding of cryptography, how it has evolved and some key encryption techniques used today.

5. Develop an understanding of security policies (such as authentication, integrity and confidentiality), as well as protocols to implement such policies in the form of message exchanges.

COURSE OUTLINE

UNIT I

20 Hrs.

Conventional Encryption : Classical Technique – Modern technique – Algorithms; Public Key Cryptography : Public Key Cryptography – Introduction to Number Theory – Message Authentication and Hash Function – HASH and MAC Algorithm – Digital Signature and Authentication protocol.

UNIT II

20 Hrs.

Network Security Practice: Authentication Application – Electronic Mail Security – IP Security Program Security and System Security: Secure programs – Nonmalicious program errors – viruses and Worms – Memory and address protection – control access to general objects – File protection mechanism – user authentication – Trusted operating system design and assurance – Intrusion Detection system.

UNIT III

15 Hrs.

System Security and Web Security: Intruders,– Firewall - Managing Access – Password management - Web Security requirements – SSL and TLS – SET; Client Side Security : Using SSL – Active Content – Web Privacy. Database Security: The Database as a Networked Server – Securing database-to-database communication – Reliability and Integrity of database – sensitive data – inference – multilevel databases

UNIT IV

15 Hrs.

Wireless Network Security: Mobile Security – Encryption Schemes in WLANs – Basic approach to WLAN security and Policy Development – WLAN intrusion process – WLAN security solutions. Digital Watermarking and Steganography: Models of Watermarking – Basic Message Coding – Watermark Security – Content Authentication – Steganography.

UNIT V

20 Hrs.

Cyber Crimes: Introduction – computer crime and cyber crimes; Classification of cyber crimes, Cyber crime and Related Concepts: Distinction between cyber crime and conventional crimes, Reasons for commission of cyber crime, Cyber forensic : Cyber criminals and their objectives, Kinds of cyber crimes – cyber stalking; cyber pornography; forgery and fraud; crime related to IPRs; Cyber terrorism; computer vandalism, Regulation of cyber crimes: Issues relating to investigation, Issues relating to Jurisdiction, Issues relating to Evidence , Relevant provisions under Information Technology Act, 2000, Indian Penal Code, Pornography Act and Evidence Act.

RECOMMENDED TEXTBOOKS:

1. Charles P. Pfleeger, Shari Lawrence Pfleegner, "Security in Computing", Prentice Hall of India, 2007.
2. William Stallings, "Cryptography and Network Security", 5th Edition, Pearson.
3. John W. Rittinghouse, James F. Ransome, "Wireless Operational Security", Elsevier, 2004.
4. Ron Ben Natan, "Implementing Database Security and Auditing", Elsevier, 2005.

REFERENCE BOOKS:

1. Lincoln D. Stein, "Web Security", Addison Wesley, 1999.
2. Ingemar J. Cox, Matthew L. Miller, Jeffrey A. Bloom, Jessica Fridrich, Ton Kalker, "Digital Watermarking and Steganography", 2nd Edition, Elsevier.
3. Dr. R. K. Tiwari, P. K. Sastri, K. V. Ravikumar, "Computer Crime and Computer Forensics", 1st Edition, Selective Publishers, 2002.
4. Wm. Arthur Conking, Gregory B. White, et al, Principles of Computer Security: Security+ and Beyond, McGraw Hill, 2010

JOURNALS:

1. International Journal of Information Security
2. Journal of Information Security and Applications.

E-LEARNING RESOURCES:

1. http://csetube.blogspot.com/2013/05/it2042-it706-information-security-is_13.html
2. https://mrcet.com/downloads/digital_notes/CSE/III%20Year/Information%20Security.pdf
3. <https://www.geeksforgeeks.org/what-is-information-security/>
4. https://en.wikipedia.org/wiki/Information_security
5. <https://www.smartworld.com/notes/information-security-pdf-notes-is-pdf-notes/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Provide an understanding of principal concepts, major issues, technologies and basic approaches in information security.
CO 2	Develop an understanding of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.
CO 3	Gain familiarity with prevalent network and distributed system attacks, defenses against them and forensics to investigate the aftermath.

CO 4	Develop a basic understanding of cryptography, how it has evolved and some key encryption techniques used today.
CO 5	Develop an understanding of security policies (such as authentication, integrity and confidentiality), as well as protocols to implement such policies in the form of message exchanges.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	2
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	3	2	2
AVERAGE	3	2	2.2	2.6	2.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

MACHINE LEARNING

TOTAL HOURS: 90 Hrs.

COURSE CODE: 172003J

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To provide an understanding of principal concepts, major issues, technologies and basic approaches in machine learning.
2. Develop an understanding of probabilistic models and algorithms.
3. Gain familiarity with Independent and identically distributed random variables.
4. Develop a basic understanding of Bayesian networks and MRFs.
5. Develop an understanding of principles of Pattern recognition.

COURSE OUTLINE

UNIT I

20 Hrs.

Introduction to machine learning. Classification: nearest neighbor – decision trees – perception – support vector machines – VC-dimension. Regression: Linear least square – regression – support vector regression.

UNIT II

20 Hrs.

Additional learning problems: multiclass classification – ordinal regression – ranking. Ensemble methods: boosting. Probabilistic models: classification – regression – mixture models (Conditional, unconditional), parameter estimation – EM algorithm.

UNIT III

20 Hrs.

Beyond IID: directed graphical models: Hidden markov models, Bayesian networks, Beyond IID, Undirected graphical models: Markov random fields, conditional random fields.

UNIT IV**20 Hrs.**

Learning and inference in Bayesian networks and MRFs: parameter estimation, exact inference (variable elimination, belief propagation), approximate inference.

UNIT V**20 Hrs.**

Additional topics: Semi-supervised learning, active learning, structured prediction, and Principles of Pattern recognition: feature vectors, decision regions, learning algorithm and optimization methods.

RECOMMENDED TEXTBOOKS:

1. Christopher M.Bishop, Pattern Recognition and Machine Learning, Springer, 2007
2. Ian H.Witten & Eibe Frank, Data Mining: Practical Machine Learning Tools and Techniques, Third Edition, 2011

REFERENCE BOOKS:

1. Machine Learning by Mitchell, Mc Graw Hill, 1997
2. Understanding Machine Learning: From Theory to Algorithms, Shai Shalev-Shwartz, Shai Ben-David, 1st Edition, Cambridge University Press, 2014
3. **Machine Learning in Action, Peter Harrington, Manning Publications Co., 2012**
4. Machine Learning-An algorithmic perspective, Stephen Marsland, CRC Press, New Jersey, USA, 2nd edition, 2014
5. Human Behavior Recognition Technologies: Intelligent Applications for Monitoring and Security, Hans W. Guesgen and Stephen Marsland, editors, IGI Global, 2013

JOURNALS:

1. Soft Computing
2. Journal of Ambient Intelligence and Smart Environments

E-LEARNING RESOURCES:

1. <https://www.cs.huji.ac.il/~shais/UnderstandingMachineLearning/understanding-machine-learning-theory-algorithms.pdf>
2. http://www2.ift.ulaval.ca/~chaib/IFT-4102-7025/public_html/Fichiers/Machine_Learning_in_Action.pdf
3. <https://seat.massey.ac.nz/personal/s.r.marsland/MLBook.html>
4. [aima.eecs.berkeley.edu > slides-ppt > ml4-bayesian](http://aima.eecs.berkeley.edu/slides-ppt/ml4-bayesian)
5. https://www.cc.gatech.edu/grads/j/jwang774/pcml_notes.pdf

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand the basic principal concepts, major issues, technologies and basic approaches in machine learning.
CO 2	Analyze the various probabilistic models and algorithms.

CO 3	Strengthen the concepts of Independent and identically distributed random variables.
CO 4	Understand and analyze the Bayesian networks and MRFs.
CO 5	Identify the tool and implement the research domain.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	2
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	3	2	2
AVERAGE	3	2	2.2	2.6	2.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

CLOUD COMPUTING

TOTAL HOURS : 90 hrs
CREDITS : 6

COURSE CODE: 172003K
L-T-P : 6-0-0

COURSE OBJECTIVES:

To enable the research Students

1. To understand the basic infrastructure services, challenges and risks in cloud computing.
2. To impart knowledge about infrastructure as a service.
3. To learn the usage of platform as a service.
4. To gain knowledge about monitoring and management of cloud computing.
5. To analyse and understand the best practices of applications.

COURSE OUTLINE:

UNIT I

10 Hrs.

Introduction to Cloud Computing: Roots of Cloud Computing - Layers and Types of Cloud – Features of a cloud-Infrastructure Management-Cloud Services - Challenges and Risks. Migrating into a Cloud: Introduction - Broad Approaches – Seven Step Model. Integration as a Service-Integration Methodology - SaaS.

UNIT II

20 Hrs.

Infrastructure as a Service: Virtual Machines - Layered Architecture-Life Cycle-VM Provisioning Process- Provisioning and Migration Services. Management of Virtual Machines Infrastructure –Scheduling Techniques. Cluster as a service-RVWS Design- Logical Design. Cloud Storage - Data Security in cloud Storage- Technologies.

UNIT III

20 Hrs.

Platform and Software as a Service: Integration of Public and Private Cloud- Techniques and tools-framework architecture-resource provisioning services - Hybrid Cloud. Cloud based solutions for business Applications- Dynamic ICT services-Importance of quality and Security in clouds-Dynamic Data center-case studies. Workflow Engine in the cloud – Architecture - Utilization.Scientific Applications for cloud – Issues – Classification – SAGA – Map Reduce Implementation.

UNIT IV

20 Hrs.

Monitoring and Management: Architecture for federated Cloud Computing – Use case – Principles – Model - Security Considerations. SLA Management - Traditional Approaches to SLO -Types of SLA - Lifecycle of SLA - Automated Policy. Performance Prediction of HPC- Grid and Cloud - HPC Performance related issues.

UNIT V

20 Hrs.

Applications: Best Practices in Architecting cloud applications in the AWS cloud - Massively multiplayer online Game hosting on cloud Resources - Building content delivery Networks using clouds-Resource cloud Mashups.

RECOMMENDED TEXTBOOKS:

1. RajkumarBuyya, James Broberg, and AndrzejGoscinski, CLOUD COMPUTING Principles and Paradigms, John Wiley & Sons, Inc, 2011 .
2. Michael Miller, Cloud Computing: Web based Applications That Change the Way You Work and Collaborate Onlinell, QUE Publishing, 2009.

REFERENCE BOOKS:

- 1.George Reese, Cloud Application Architecturesll, O'Reilly Media, Inc, First Edition, 2009.
- 2.SandeepBhowmik, Cloud Computing, Cambridge University Press, 2017.

3. Ronald L Krutz, Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley, 2010.
4. **Thomas Erl, Ricardo Puttini, Zaigham Mahmood, Cloud Computing: Concepts, Technology & Architecture, Prentice Hall, 2013.**
5. **Judith S. Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper, Cloud Computing For Dummies , John Wiley & Sons, 2010**

JOURNALS:

1. Journal of Cloud Computing: Advances, Systems and Applications (JoCCASA).
2. IEEE Transactions on Cloud Computing

E-LEARNING RESOURCES:

1. <http://www.akana.com>
2. [http:// Myitstudy.com](http://Myitstudy.com)
3. <http://Oreilly.com>
4. <http://content.taylorfrancis.com>
5. <http://Javapoint.com>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Extend adequate study over the basics of cloud-Infrastructure Management, Cloud Services - Challenges and Risks.
CO 2	Understanding the functionality Infrastructure as a Service: Virtual Machines and Scheduling Techniques

CO 3	Learning the elements of Platform and Software as a Service ,its importance of quality and Security in clouds.
CO 4	Learn the technical implementations wrapped in Monitoring and Management with architecture for federated Cloud Computing
CO 5	UnderstandingtheBest Practices in Architecting cloud applications in the AWS cloud

MAPPING-CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	2	2	2
CO 2	3	2	2	2	2
CO 3	3	2	2	3	2
CO 4	3	2	2	2	2
CO 5	2	2	2	3	3
Average	2.8	2	2	2.8	2.2

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture by chalk and talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

SOFT COMPUTING

TOTAL HOURS: 90 Hrs.

COURSE CODE: 172003L

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. Develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory.
2. Introduce students to artificial neural networks and fuzzy theory from an engineering perspective
3. To provide the mathematical background for carrying out the optimization associated with neural network learning.
4. To relate with neural networks that can learn from available examples and generalize to form appropriate rules for inference systems
5. To develop some familiarity with current research problems and research methods in Soft Computing by working on a research or design project.

COURSE OUTLINE

UNIT I

15 Hrs.

Introduction - Hard Computing – Features of Hard computing – Soft computing- Features of soft computing – Hybrid Computing – Introduction to Optimization – Examples – Classification – Principle – Duality Principle – Traditional Methods of optimization – Exhaustive search methods – Random walk methods – Steepest Descent method – Drawbacks.

UNIT II

15 Hrs.

Introduction to genetic algorithms – Working cycle – Binary Coded GA – Crossover or Mutation – A hand calculation – fundamental theorem of GA – Limitations – GA parameters setting – constraints – Advantages – disadvantages – some specialized Genetic algorithms – Real coded GA – Cross over operators – Mutation Operators – Micro GA – Visualized Interactive GA – Scheduling GA.

UNIT III

15 Hrs.

Introduction to Fuzzy Sets – Crisp Sets – Notation – Operations – Properties – Fuzzy Sets – Representation – Difference between crisp set and Fuzzy set – Definitions – Standard Operations – Properties of Fuzzy sets – Fuzzy reasoning and clustering – Fuzzy Logic controller – Two major forms – Hierarchical fuzzy logic controller – Sensitivity analysis – Advantages – disadvantages – Fuzzy clustering – Fuzzy C-means Clustering – Entropy based Fuzzy Clustering.

UNIT IV

15 Hrs.

Fundamentals of Neural Networks – Biological neuron – Artificial neuron – A layer of Neurons – Multiple Layers of Neurons – Static Vs Dynamic Neural Networks – Training of Neural Networks – Examples of neural networks – Multi-layer Feed-Forward Neural Network – Radial Basis Function Network – Self Organizing Map.

UNIT V

30 Hrs.

Combined Genetic algorithm: Fuzzy Logic – Fuzzy –Genetic Algorithms – Genetic – Fuzzy System – Combined Genetic algorithms : Neural Networks – Working Principle of a Genetic –Neural System – Forward Calculation – Combined Neural Networks: Fuzzy Logic – Neuro

Fuzzy System Working Based on Mamdani Approach – Neuro Fuzzy system working based on Yakagi and Sugeno's Approach.

CASE STUDY: Implementation of the methods/techniques used in the base paper selected.

TOOLS: MATLAB / PYTHON.

RECOMMENDED TEXTBOOKS:

1. Dilip Kumar Pratikar, Soft computing, Narosa Publishing House 2009.

2.S.N.Sivanandam, S.N Deepa, "Principles of Soft Computing"

BOOKS FOR REFERENCE:

1. Naresh K. Sinha & Madan M. Gupta, Soft Computing and Intelligent Systems, Elseiver 1999.

2. S.N. Sivanandam& S.N. Deepa, Principles of Soft Computing, Wiley India 2007.1.William K Pratt, Digital Image Processing John Willey (2001)

3. MillmanSonka, Vaclav hlavac, Roger Boyle, Broos/colic Image Processing Analysis and Machine Vision, Thompson Learniy (1999)

4. Chanda Dutta Magundar – Digital Image Processing and Applications, Prentice Hall of India

5. William K. Pratt,Digital Image Processing John Wiley, New York, 2002

6. Milan Sonka et al Image processing, analysis and machine vision Brookes/Cole, Vikas Publishing House, 2nd edition, 199

JOURNALS:

1. Journal of Soft Computing and Applications

2. ICTACT Journal on Soft Computing - An International Publication of ICT Academy.

E-LEARNING RESOURCES:

1. <https://lecturenotes.in/subject/124/soft-computing-sc>

2. https://www.tutorialspoint.com/fuzzy_logic/index.htm

3. http://www.myreaders.info/html/soft_computing.html

4. <http://users.du.se/~jwe/fuzzy/NFL/F9.PDF>

5. <https://youtu.be/VPwqMloXxHw>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Comprehend the fuzzy logic and the concept of fuzziness involved in various systems and fuzzy set theory.
CO 2	Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic.
CO 3	To understand the fundamental theory and concepts of neural networks, Identify different neural network architectures, algorithms, applications and their limitations.
CO 4	Understand appropriate learning rules for each of the architectures and learn several neural network paradigms and its applications.
CO 5	Reveal different applications of these models to solve engineering and other problems.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	2	3	3
CO3	3	2	3	3	3
CO4	3	2	2	3	2
CO5	3	2	3	2	3
AVERAGE	3	2.4	2.6	2.6	2.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

INFORMATION RETRIEVAL

TOTAL HOURS: 90Hrs.

COURSE CODE: 172003M

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To understand the fundamentals of Information retrieval and components of information retrieval.
2. To study the relationship between DBMS, Data Warehouse with Information Retrieval
3. To understand the concepts and techniques of IR
4. To Learn the concepts of classification and clustering techniques using Data mining tools
5. To study and implement case studies of information retrieval

COURSE OUTLINE

UNIT I: INTRODUCTION

15 Hrs.

Introduction -History of IR- Components of IR - Issues –The impact of the web on IR - The role of artificial intelligence (AI) in IR – IR Versus Web Search - Components of a Search

engine- Characterizing the web – Primary information Retrieval problems and Objective – Functional overview of Information Retrieval System – Understanding Search Functions – Relationship to DBMS – Digital Libraries and Data Warehouse – Data Structures and Mathematical Algorithm

UNIT II : INFORMATION RETRIEVAL

15 Hrs.

Index Compression – Scoring, Term weighting and the vector space model – Computing scores in a complete search system – Evolution in information retrieval –Relevance feedback and query expansion – XML Retrieval – Flat clustering – Hierarchical clustering –Boolean Retrieval – Term Vocabulary and posting lists – Dictionaries and tolerant retrieval – Index construction - Index compression – Scoring term weighting and the vector space model – Computing Score in a complete search system – Evolution in information retrieval - Probabilistic information Retrieval – Language model for information retrieval – Text Classification and Naïve Bayes – Vector Space Classification

UNIT III :DOCUMENT TEXT MINING

15 Hrs.

Information filtering; organization and relevance feedback – Text Mining -Text classification and clustering - Categorization algorithms: naive Bayes; decision trees; and nearest neighbour – Clustering algorithms: agglomerative clustering; k-means; expectation maximization (EM) – -Ingest – Indexing –Search - Document and Term clustering – Information Presentation

UNIT IV

20 Hrs.

Case Tools

UNIT V

25 Hrs.

Case Study

RECOMMENDED TEXTBOOKS:

1. C. Manning, P. Raghavan, and H. Schütze, Introduction to Information Retrieval , Cambridge University Press, 2008.
2. Ricardo Baeza -Yates and BerthierRibeiro - Neto, Modern Information Retrieval: The Concepts and Technology behind Search 2nd Edition, ACM Press Books 2011.

REFERENCES BOOKS:

1. Stefan Buettcher, Charles L. A. Clarke, Gordon V. Cormack, “Information Retrieval: Implementing and Evaluating Search Engines”, The MIT Press, 2010.
2. Ophir Frieder “Information Retrieval: Algorithms and Heuristics: The Information
3. Ted Kwartler, “Text Mining in Practice with R”, Wiley Publication
4. Thomas W. Miller, “Data and Text Mining- A Business Application Approach”, Pearson Publication
5. Goutam Chakraborty, Murali Pagolu, Satish Garla, “Text Mining and Analysis – Practice methods, Examples and Case Studies using SAS”, SAS Institute

JOURNALS:

1. Information Retrieval Journal-Springer
2. International Journal for Information Retrieval Research(IJIRR)

E-LEARNING RESOURCES:

1. <https://nlp.stanford.edu/fsnlp/ir/fsnlp-slides-ir.pdf>
2. https://www.comp.nus.edu.sg/~zhaojin/cs3245_2018/w2.pdf
3. https://sigir.org/files/museum/isr-10/pdfs/p1-chapter_5.pdf
4. https://www.researchgate.net/publication/305808737_Document_Retrieval_System_a_Case_Study
5. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.105.4134&rep=rep1&type=pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand fundamental concepts of Information Retrieval
CO 2	Analyze the problems in the information retrieval system in various domain
CO 3	Understand the techniques for information retrieval
CO 4	Identifying the tools and implementing them in the real world problems.
CO 5	Interpret the results with the available case records.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	1
CO2	3	3	3	3	3
CO3	3	2	2	1	3
CO4	3	3	2	2	3
CO5	3	2	1	2	3

AVERAGE	3	2.4	2	2	2.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY
CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

KNOWLEDGE MANAGEMENT

TOTAL HOURS: 90Hrs.

COURSE CODE: 172003N

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To understand the fundamentals of Knowledge Management and Ethics of Knowledge Management.
2. Able to study the models available in knowledge management.
3. To understand the concepts and techniques of Knowledge management
4. Learn the tools available for knowledge management.
5. To study and implement case studies of Knowledge Management.

COURSE OUTLINE

UNIT - I

15 Hrs.

Basics - What is Knowledge Management? - Key Challenges - KM Life Cycle - Understanding Knowledge – Definitions - Cognition and Knowledge Management - Data, Information, and Knowledge - Types of Knowledge - Expert Knowledge. Knowledge Management System Life Cycle - Challenges in Building KM Systems - Conventional Versus KM System Life Cycle - System Justification - Role of Rapid Prototyping - Role of Knowledge Developer – User Training. The Evolution of Knowledge management: From Information Management to Knowledge Management - Key Challenges Facing the Evolution of Knowledge Management - Ethics for Knowledge Management.

UNIT – II

15 Hrs.

Knowledge Creation - Nonaka's Model of Knowledge Creation and Transformation - Knowledge Architecture - Capturing Tacit Knowledge – Evaluating the Expert – Developing a relationship with Expert – Interview as a tool – Knowledge capturing Techniques – On-Site Observation - Brainstorming – Repertory Grid – Nominal Group Techniques (NGT) – Delphi method – Concept mapping - Knowledge Codification - Codification Tools and Procedures - Knowledge Developers Skill Set - Knowledge Transfer - Transfer Methods - Portals Basics - Business Challenge - Knowledge Portal Technologies - Ethical and Legal Issues - Knowledge Owners - Legal Issues.

UNIT III

15 Hrs.

KM system Tools– Social knowledge networks and Social Intelligence – The Basics – Internet-Based SNNs – Energizers and Sappers – Social knowledge Network Analysis – Social Software Tools – Data Mining – the Hidden power of knowledge discovery Telecommunications and Networks in Knowledge Management - Internet Search Engines and Knowledge Management - Information Technology in Support of Knowledge Management - Knowledge Management and Vocabulary Control

UNIT IV

20 Hrs.

Case Tools

UNIT V

25 Hrs.

Case Study

RECOMMENDED TEXTBOOKS:

1. Elias M.Awad, Hassan M.Ghaziri, "Knowledge Management", Pearson Education (Edition 2004).
2. A Thothathri Raman, Knowledge Management a resource book, EXCEL Books, 2004. ISBN 817446-351-8 (PB), 81-7446-352-6 (HB)

REFERENCE BOOKS

1. Kai Mertins, Peter Heisig, Jens Vorbeck, "Knowledge Management: Concepts and Best Practices", Springer Publications, Second Edition.

2. Srikantaiah.T. K., Koenig, M., “Knowledge Management for the Information Professional” Information Today, Inc., 2000.
3. KimizDalkir, “ Knowledge Management in Theory and Practice”, Elsevier
4. Madhan Mohan Rao, “ Knowledge Management Tools and Techniques Practitioners and Experts Evaluate KM Solutions”, Elsevier
5. Ajit Kumar Roy, “ Information and Knowledge Management: Tools, Techniques and Practice”, NIPA

JOURNALS

1. International Journal of Knowledge Management Studies.
2. Journal of Knowledge Management.

E-LEARNING RESOURCES:

1. <https://www.knowledge-management-tools.net/knowledge-management.php>
2. https://link.springer.com/chapter/10.1007/11510154_10
3. <https://pdfs.semanticscholar.org/22cc/a07c3379dd79fe788d7e8cc0944d3d1d9c09.pdf>
4. <https://www.healthcatalyst.com/enable-knowledge-management-in-healthcare>
5. <http://cmc.ihmc.us/papers/cmc2004-237.pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand fundamental concepts of knowledge management
CO 2	Analysis of research problems in Knowledge Management in various domain
CO 3	Understand the techniques of Knowledge Management
CO 4	Identifying the tools and implementing them in the real world problems.
CO 5	Interpret the results with the available case studies.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	3	2
CO2	3	3	3	1	3
CO3	3	2	2	3	2
CO4	3	3	2	3	3
CO5	3	2	1	3	2
AVERAGE	3	2.4	2	2.6	2.4

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

TOTAL HOURS: 90 Hrs.
172003O

COURSE CODE:

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To master information security governance, and related legal and regulatory issues,
2. To master fundamentals of secret and public cryptography,
3. To be familiar with network security threats and countermeasures,
4. To be familiar with advanced security issues and technologies (such as DDoS attack detection and containment, and anonymous communications,),
5. To be exposed to original research in network security,

UNIT – I

20

Hrs.

Security Problem in Computing: Protecting variables – Characteristics of computer intrusion – Attacks - Security goals – Vulnerabilities- Computer criminals – methods of defense- Elements of cryptography : Terminology and background – Substitution ciphers – Transpositions – Encryption algorithms – DES–RSA Algorithm – Uses of encryption

UNIT – II

20

Hrs.

Program Security: Secure program - Non Malicious program errors – Virus and other malicious code – controls against program threads - – Protection in general purpose operating system: protected objects and methods of protection - Memory and address protection – control of access to general objects – file protection mechanism -user authentications

UNIT – III

15

Hrs.

Designing Trusted Operating System: Security policy – Models of security – Trusted OS Design - Assurance in trusted OS - implementation - Database security

UNIT – IV

20

Hrs.

Security in Networks: NT concepts – Threads in NT – Network Security controls – firewalls
- Intrusion detection system – Secure Email. Administering security: Security planning –
Risk analysis – Organisation security policies – Physical security

UNIT – V

15

Hrs.

Legal, Privacy and Ethical Issues in Computer Security: Protecting programs and data –
Information of Computer objects –Rights of employees and Employers- Software failure –
Computer crime – Privacy - Ethical issues in Computer Security

RECOMMENDED TEXTBOOKS:

1. Charles P.Pfleeger, and Shari Lawrence Pfleeger, “Security in Computing”, Second Edition, Pearson Education (Singapore) Pvt. Ltd, 2004.
2. AtulKahate, “Cryptography and Network Security”, Tata-Mcgraw Hill Publication Ltd., New Delhi, 2003.

REFERENCE BOOKS:

1. Eric Maiwald, “Network Security a Beginner’s Guide”, Second Edition, Tata-Mcgraw Hill Publication Ltd., New Delhi, 2003.
2. William Stallings, “Cryptography And Network Security – Principles and Practices”, Pearson, Sixth Edition, 2015.
3. Bruce Schneier, “Applied Cryptography”, John Wiley & Sons Inc, 2011.
4. Andrew S Tanenbaum, “Computer Networks”, PHI, Fourth Edition, 2005.
5. WilliamsStallings, “Data and Computer Communication”, PHI, Sixth Edition, 2003

JOURNALS:

1. International Journal of Network Security & Its Applications (IJNSA)
2. International Journal of Network Security

E-LEARNING RESOURCES:

1. <https://www.geeksforgeeks.org/threats-to-information-security/>.
2. https://tccl.arcc.albany.edu/knilt/images/6/6e/Unit3_LectureNotes.pdf
3. <https://www.geeksforgeeks.org/threats-to-information-security/>
4. <https://securitytrails.com/blog/top-10-common-network-security-threats-explained>
5. <https://www.secureworks.com/blog/cyber-threat-basics>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Master information security governance, and related legal and regulatory issues,
CO 2	Master fundamentals of secret and public cryptography,
CO 3	Familiar with network security threats and countermeasures,
CO 4	Familiar with advanced security issues and technologies (such as DDoS attack detection and containment, and anonymous communications,),
CO 5	Exposure to original research in network security,

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	2
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	3	2	2
AVERAGE	3	2	2.2	2.6	2.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

KNOWLEGE MINING

TOTAL HOURS: 90 Hrs.

COURSE CODE: 172003P

CREDITS: 6

L-T-P: 6-0-0

COURSE OBJECTIVES:

1. To study the knowledge discovery fundamentals and pre-processing methods.
2. To analyze and understand the unsupervised methods.
3. To gain knowledge of Soft Computing Methods.
4. To study the meta-learning and text mining methods.
5. To study and implement case studies on knowledge mining.

COURSE OUTLINE

UNIT I

20 Hrs.

Introduction: Knowledge discovery in data bases-preprocessing methods: Data Cleansing: General method-Handling missing attribute values: Sequential methods, parallel methods-Supervised methods: Introduction: Training set, definition of the classification problem, Induction algorithms-Decision Trees: Decision tree, Algorithmic Framework, Pruning methods-Decision Trees Inducers- Bayesian Networks: Introduction, representation, reasoning, Bayesian networks in data mining, applications.

UNIT II

15 Hrs.

Unsupervised Methods: clustering methods: clustering methods: Introduction-Distance measures-Similarity Functions-Clustering methods-Model based clustering methods-Clustering large data sets-Incremental Clustering-determining number of clusters-Association Rules: Introduction-Association rule mining-applications-extensions of basic framework - Frequent Set mining: Introduction-Problem Description-Apriori-Eclat-Optimizations-Concise representation-Link Analysis: Introduction -Social Network Analysis-Search Engines-Viral Marketing-Law Enforcement and Fraud Detection-Combining with Traditional methods.

UNIT III

15 Hrs.

Soft Computing Methods: Evolutionary algorithms for data mining: Overview-evolutionary algorithms for discovering classification rules, clustering, data preprocessing-Neural Networks: Neural Network Model, Data mining applications-Fuzzy Logic in Data mining: Fuzzy Sets and Fuzzy Logic, Soft Regression, Fuzzy Association Rules-Statistical methods for data mining: introduction, Statistical Issues in Data mining, Modeling Relationship using regression models-Quality Assessment Approaches in Data mining: Introduction-data

preprocessing and Quality Assessment-Evaluation of Classification methods-Association rules-Cluster Validity-Data mining Query Languages: Need, supporting Association Rule mining process, proposals for Association Rule Mining.

UNIT IV

20 Hrs.

Advanced Methods: Meta –Learning: Meta-Learning Architecture, Techniques in Meta-Learning, Tools and applications-Mining Data Streams: The data expiration problem, Classifier Ensemble for drifting concepts, Experiments-Text Mining and Information Extraction: Introduction- Text Mining vs. Text Retrieval-Task Oriented approaches-Formal Frameworks and Algorithm Based Techniques-Hybrid Approaches-TEG-Text mining-Visualization and Analytics-Spatial Data Mining: Spatial Data-spatial outliers-spatial co-location rules-predictive models-spatial clusters-Web Mining: Introduction-Graph properties of the web- Web Search-Text Classification-Hypertext Classification-Information Extraction and Wrapper Induction-The Semantic Web-Web usage mining-Collaborative Filtering-Web document clustering approaches: Motivation-Web Document clustering approaches.

UNIT V

20 Hrs.

Applications: Data mining in medicine- Learning Information patterns in Biological Databases-Selection in Manufacturing Processes-Design products and processes-Telecommunications-financial communications-intrusion detection-software testing-study of mining tools-case study.

RECOMMENDED TEXTBOOKS:

- 1.OdedMaimon, LiorRokach, “The Data Mining and Knowledge Discovery Handbook”, Springer International Edition, 2009.
- 2.Usama M.Fayyad, Gregory, Piatetsky-Shapiro, Padhraic Smyth, RamasamyUthursamy, ”Advances in Knowledge Discovery and Data Mining”, PHI, 2010.

REFERENCE BOOKS:

- 1.Jiawei Han and Micheline Kamber, Data Mining: Concepts and Techniques, 2nd edition, Morgan Kaufmann Publishers, Second Edition, 2010
- 2.Michael W. Berry, Survey of Text Mining – Clustering, Classification and Retrieval, Springer International Edition
- 3.Gerald J. Kowalski, Mark T. Maybury, Information Storage and Retrieval System – Theory and Implementation, Second Edition, Springer International Edition, 2012
- 4.Margaret H.Dunham, PearsonEducation, Data Mining: Introductory and Advanced Topics, 2004

5. Discovering Knowledge in Data: An Introduction to Data Mining, Daniel T. Larose, Chantal D. Larose, 2nd Edition, Wiley, 2014

JOURNALS:

1. International Journal of Information Retrieval
2. International Journal of Innovative Technology and Exploring Engineering

E-LEARNING RESOURCES:

1. https://www.tutorialspoint.com/data_mining/dm_knowledge_discovery.htm
2. http://www.kdnuggets.com/data_mining_course/x1-intro-to-data-mining-notes.html
3. <https://www.slideshare.net/kanimozhiu/text-data-mining1>
4. https://www.cse.iitb.ac.in/~cs725/notes/classNotes/extra_lecturenotes_cs725.pdf
5. <http://www.cs.tut.fi/~avisa/lec1.pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand the basic principal concepts, knowledge discovery fundamentals and pre-processing methods..
CO 2	Analyze the various unsupervised methods.
CO 3	Strengthen the concepts of of Soft Computing Methods.
CO 4	Understand and analyze the meta-learning and text mining methods.
CO 5	Identify the tool and implement the research domain.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	2
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	3	2	2
AVERAGE	3	2	2.2	2.6	2.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Assignments

QUESTION PAPER PATTERN-M.Phil.

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K1, K2, K3	A - 5/8 X 20 marks	1500	100	100	One question from each Unit not more than 2 questions per unit.

**QUAID - E- MILLATH GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS), CHENNAI - 600 002.**

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS



MASTER OF COMPUTER APPLICATIONS

CHOICE BASED CREDIT SYSTEM OUTCOME BASED EDUCATION

(OFFERED FROM THE ACADEMIC YEAR 2017 -2018)

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**QUAID-E-MILLATH GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS)**

ANNA SALAI, CHENNAI 600002

MASTER OF COMPUTER APPLICATIONS

Post Graduate Courses with Choice Based Credit System

Quaid-E-Millath Government College for Women (Autonomous) offers the Semester System of education with credits for PG courses. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working hours and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures /tutorials /laboratory work /seminar /project work/ practical training/ viva voce etc to facilitate effective teaching and learning and the credits are assigned accordingly, depending on the content and the specialization.

The Total credit for the three year MCA course would be **118**.

SYSTEM OF CREDITS

Year	No. of Papers			Marks	Credits		
	Core	Elective	Soft Skill		Core	Elective	Soft Skill
I Year	12	0	01	1200	36	0	4

II Year	10	02	01	1200	30	6	4
III Year	04	02	01(Internship)	0600	30	6	2(Internship)
Total	26	04	03	3000	96	12	10

REGULATIONS

1. Duration

a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second academic year, the third and fourth semesters, the second academic year, the third and fourth semesters. The third year comprises of the fifth and the sixth semesters.

b. The odd semester shall consist of the period from June to November of each year and the even semesters from December to April of each year.

2. Course of Study

The course of study for Postgraduate Degree Courses shall comprise of Core courses and Electives.

Year	No. of Papers				Marks	Credits				
	Core	Elective	Extra-Disciplinary Elective	Soft Skill		Core	Elective	Extra-Disciplinary Elective	Soft Skill	Internship
I Year	7	3	1	2	1300	28	9	3	4	2

II Year	8	2	1	2	1300	32	6	3	4	
II Year	8	2	1	2	1300	32	6	3	4	
Total	15	5	2	4	2600	60	15	6	8	2

3. Distribution of marks for Continuous Assessment:

Test 1	Test 2	Test 3(objective)	Assignment/Seminar/Creative Presentation-1	Assignment/Seminar/Creative Presentation-2	Attendance	Model Exam	Total
20	20	5	10	10	10	25	100

Test (Best two out of three) : 40 Marks

Assignment/ Seminar /

Creative Presentation : 25 Marks

Model Examination : 25 Marks

Attendance : 10 Marks

Total (Internal) : 100 Marks reduced to 25

Calculation of Attendance Marks

90 – 100%	-	10 Marks
80 – 89%	-	9 Marks
75 – 79%	-	8 Marks
65 – 74%	-	7 Marks
55 – 64%	-	5 Marks
Below 55%	-	0 – Not Eligible

4. Examination/Evaluation pattern

The pattern of evaluation is as follows.

End Semester Examination : 75 Marks

Continuous Internal Assessment : 25 Marks

PATTERN OF QUESTION PAPER

TIME : 3 Hrs
75

MAX. MARKS :

SECTION A

K1

Answer any TEN out of TWELVE questions :

(10x2=20)

SECTION B

K2, K3

Answer any FIVE out of EIGHT questions:

(5x5=25)

SECTION C

K3

Answer any THREE out of FIVE questions:

(3x10=30)

5. Passing Minimum

A candidate shall be declared to have passed in each paper/practical of the Main subject of study wherever prescribed if she secures **NOT LES THAN 50%** of the marks prescribed for the examination.

6. Eligibility for the Award of Degree

Candidates must secure a minimum of 50% of marks in the End Semester examinations and a minimum of 50% in the aggregate marks (Both End Semester and the Continuous Assessment taken together).

A candidate must secure 8 credits in soft skills and 2 credit in the internship in addition to the 108 credits from Core and Elective courses to obtain the PG Degree of Master of Computer Applications.

7. Ranking

Candidates who have passed all the examination prescribed for the course in the **FIRST APPEARANCE** alone are eligible for Classification/Ranking/Distinction.

PROGRAMME OUTCOMES (POs)

On completion of the Programme, the learner will be able to:

- PO 1** Apply Computational knowledge
- PO 2** Identify quality research
- PO 3** Demonstrate entrepreneur, creative and communication skills
- PO 4** Acquire through knowledge of the subject
- PO 5** Analyse the fundamental research

PROGRAMME SPECIFIC OUTCOME (PSOs)

On completion of the specific programme Master of Computer Applications the student will be able to:

- PSO 1** Understand and apply the principles and Development methodologies of Computer systems.
- PSO 2** Apply standard strategies such as Mathematical knowledge, algorithmic principles knowledge in real-time software project development
- PSO 3** Design the systems using open-source programming environment or commercial environment to deliver quality product for the organization success

PSO 4 Develop the systems in the variety of areas related to algorithms, networking, web design, data analytics of varying complexity

PSO 5 Acquaint with the current trends in industrial/research settings and thereby innovate novel solutions to existing problems

PROGRAMME PROFILE – M.C.A

SE M	COURSE CODE	TITLE OF THE PAPER	CREDITS	HOU RS/ WK	TOTAL HOURS	CA	SE	TOT AL
I	176701	PROBLEM SOLVING ANSD PROGRAMMING TECHNIQUES	3	5	90	25	75	100
	176702	MATHEMATICAL FOUNDATIONS	3	5	90	25	75	100
	176703	PRINCIPLES OF MANAGEMENT	3	5	90	25	75	100
	176704	DATABASE APPLICATION DESIGN AND DEVELOPMENT	3	5	90	25	75	100
	176705	OFFICE AUTOMATION AND INTERNET APPLICATIONS- LAB	3	5	90	25	75	100
	176706	C PROGRAMMING - LAB	3	5	90	25	75	100
II	176707	OBJECT ORIENTED PROGRAMMING AND DATA STRUCTURES	3	5	90	25	75	100
	176708	BUSINESS INTELIGENCE	3	5	90	25	75	100
	176709	DESIGN AND ANALYSIS OF ALGORITHMS	3	5	90	25	75	100
	176710	OPERATING SYSTEM CONCEPTS AND SHELL PROGRAMMING	3	5	90	25	75	100

	176711	PROGRAMMING WITH C++ AND DATA STRUCTURES - LAB	3	5	90	25	75	100
	176712	APPLICATIONS OF MATHEMATICAL FOUNDATIONS USING C - LAB	3	5	90	25	75	100
III	176713	OBJECT ORIENTED ANALYSIS AND DESIGN	3	5	90	25	75	100
	176714	SOFTWARE PROJECT MANAGEMENT	3	5	90	25	75	100
	176715	RESOURCE MANAGEMENT TECHNIQUES	3	5	90	25	75	100
	176716	ASP .NET PROGRAMMING	3	5	90	25	75	100
	176717	ASP.NET PROGRAMMING - LAB	3	5	90	25	75	100
	176718	BIG DATA ANALYSIS	3	5	90	25	75	100
	176719	C# AND .NET TECHNOLOGY	3	5	90	25	75	100
IV	176720	WEB PROGRAMMING AND JAVA	3	5	90	25	75	100
	176721	INFORMATION SECURITY	3	5	90	25	75	100
	176722	COMPUTER NETWORKS AND SECURITY	3	5	90	25	75	100
	176723	DATA WAREHOUSING AND DATA MINING	3	5	90	25	75	100
	176724	WEB PROGRAMMING AND JAVA - LAB	3	5	90	25	75	100
	176725	PROFESSIONAL ETHICS	3	5	90	25	75	100
	176726	CRYPTOGRAPHY	3	5	90	25	75	100
V	176727	SOFTWARE TESTING AND QUALITY ASSURANCE	3	5	90	25	75	100
	176728	PRINCIPLES OF COMPILER DESIGN	3	5	90	25	75	100
	176729	FINANCIAL TRENDS	3	5	90	25	75	100
	176730	GUI PROGRAMMING	3	5	90	25	75	100
	176731	MINI PROJECT	3	5	90	25	75	100
	176732	BIOINFORMATICS	3	5	90	25	75	100
	176733	DIGITAL IMAGE PROCESSING	3	5	90	25	75	100

VI	176734	PROJECT WORK AND VIVA VOCE	18	5	90	25	75	100

EVALUATION PATTERN FOR CONTINUOUS ASSESSMENT- PG

INTERNAL VALUATION BY COURSE TEACHER/S

PART I, II AND III-THEORY PAPERS

COMPONENT	TIME	MAX.MARKS	CAMARK
1.TEST I	1 HRS	20 MARKS(TO BE CONVERTED)	20
2. TEST II	1 HRS	20 MARKS (TO BE CONVERTED)	20
3.ASSIGNMENT/SEMINAR/FIELD VISIT			25
4. MODEL EXAMINATION			25
4.ATTENDANCE			10
TOTAL			100

PART III- PRACTICAL PAPERS

COMPONENT	MARKS

1.TEST I	1 HRS	20 MARKS(TO BE CONVERTED)	20
2. TEST II	1 HRS	20 MARKS (TO BE CONVERTED)	20
3. RECORD/OBSERVATION			25
4. MODEL EXAMINATION			25
4.ATTENDANCE			10
TOTAL			100

CA QUESTION PAPER PATTERN-UG

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-2X2 marks	50	04	20
K1, K 2	B-1/1x6marks	200	06	
K2, K 3	C-2/2x10 marks	500	10	

RUBRICS FOR CONTINUOUS ASSESSMENT

S.No.	Component	Criteria
1	Assignment	Content Originality Presentation Schematic Representation Diagram Bibliography

2	Seminar	Organisation Subject Knowledge Visual Aids Confidence level Presentation Communication Language
3	Field Visit	Participation Preparation Attitude Leadership
4	Participation	Answering Questions Clearing Doubts Participating in Group Discussions Regular Attendance

**END SEMESTER EVALUATION PATTERN – P.G.,
THEORY PAPERS**

SEMESTER I/II/III/IV

DOUBLE VALUATION BYCOURSE TEACHER AND EXTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARKS : 38

PRACTICAL PAPERS

SEMESTER I/II/III/IV

VALUATION BY EXTERNAL EXAMINER AND INTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARK : 38

SOFT SKILLS PAPERS

SEMESTER I/II/III/IV

SINGLE VALUATION BY INTERNAL EXAMINER

MAXIMUM MARKS : 60

PASSING MARKS : 30

PROJECT PAPER

SEMESTER IV

DOUBLE VALUATION BY RESEARCH SUPEVISOR AND EXTERNAL EXAMINER

DISSERTATION : 75

VIVA-VOCE:25

MAXIMUM MARKS : 100

PASSING MARKS : 50

INTERNSHIP

YEAR II

SEMESTER IV

MAXIMUM MARKS : 100

PASSING MARKS : 50

SEMESTER I COURSE PROFILE – M C A

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS /WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
176701	PROBLEM SOLVING ANSD PROGRAMMING TECHNIQUES	3	5	90	3-0-0	25	75	100
176702	MATHEMATICAL FOUNDATIONS	3	5	90	3-0-0	25	75	100
176703	PRINCIPLES OF MANAGEMENT	3	5	90	3-0-0	25	75	100
176704	DATABASE APPLICATION DESIGN AND DEVELOPMENT	3	5	90	3-0-0	25	75	100
176705	OFFICE AUTOMATION AND INTERNET APPLICATIONS- LAB	3	5	90	0-0-3	25	75	100
176706	C PROGRAMMING - LAB	3	5	90	0-0-3	25	75	100
	TOTAL CREDITS	18						

SEMESTER II COURSE PROFILE – M C A

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS /WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
176707	OBJECT ORIENTED PROGRAMMING AND DATA STRUCTURES	3	5	90	3-0-0	25	75	100
176708	BUSINESS INTELIGENCE	3	5	90	3-0-0	25	75	100
176709	DESIGN AND ANALYSIS OF ALGORITHMS	3	5	90	3-0-0	25	75	100
176710	OPERATING SYSTEM CONCEPTS AND SHELL PROGRAMMING	3	5	90	3-0-0	25	75	100
176711	PROGRAMMING WITH C++ AND DATA STRUCTURES - LAB	3	5	90	0-0-3	25	75	100
176712	APPLICATIONS OF MATHEMATICAL FOUNDATIONS USING C-LAB	3	5	90	0-0-3	25	75	100
	TOTAL CREDITS	18						

SEMESTER III COURSE PROFILE – M C A

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS /WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
176713	OBJECT ORIENTED ANALYSIS AND DESIGN	3	5	90	3-0-0	25	75	100
176714	SOFTWARE PROJECT MANAGEMENT	3	5	90	3-0-0	25	75	100
176715	RESOURCE MANAGEMENT TECHNIQUES	3	5	90	3-0-0	25	75	100
176716	ASP .NET PROGRAMMING	3	5	90	3-0-0	25	75	100
176717	ASP.NET PROGRAMMING - LAB	3	5	90	0-0-3	25	75	100
176718	BIG DATA ANALYSIS	3	5	90	3-0-0	25	75	100
176719	C# AND .NET TECHNOLOGY	3	5	90	3-0-0	25	75	100
	TOTAL CREDITS	18						

SEMESTER IV COURSE PROFILE – M C A

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS /WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
176720	WEB PROGRAMMING AND JAVA	3	5	90	3-0-0	25	75	100
176721	INFORMATION SECURITY	3	5	90	3-0-0	25	75	100
176722	COMPUTER NETWORKS AND SECURITY	3	5	90	3-0-0	25	75	100
176723	DATA WAREHOUSING AND DATA MINING	3	5	90	3-0-0	25	75	100
176724	WEB PROGRAMMING AND JAVA - LAB	3	5	90	0-0-3	25	75	100
176725	PROFESSIONAL ETHICS	3	5	90	3-0-0	25	75	100
176726	CRYPTOGRAPHY	3	5	90	3-0-0	25	75	100
	TOTAL CREDITS	18						

SEMESTER V COURSE PROFILE – M C A

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS /WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
176727	SOFTWARE TESTING AND QUALITY ASSURANCE	3	5	90	3-0-0	25	75	100
176728	PRINCIPLES OF COMPILER DESIGN	3	5	90	3-0-0	25	75	100
176729	FINANCIAL TRENDS	3	5	90	3-0-0	25	75	100
176730	GUI PROGRAMMING	3	5	90	3-0-0	25	75	100

176731	MINI PROJECT	3	5	90	3-0-0	25	75	100
176732	BIOINFORMATICS	3	5	90	3-0-0	25	75	100
176733	DIGITAL IMAGE PROCESSING	3	5	90	3-0-0	25	75	100
	TOTAL CREDITS	18						

SEMESTER VI COURSE PROFILE – M C A

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS /WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
176734	PROJECT WORK AND VIVA VOCE	18				25	75	100
	TOTAL CREDITS	18						

SEMESTER I

PROBLEM SOLVING AND PROGRAMMING TECHNIQUES

TOTAL HOURS: 90 Hrs

COURSE CODE: 176701

CREDITS:3

L-T-P:3-0-0

COURSE OBJECTIVES:

1. To gain knowledge of implementing problem solving techniques using programming languages.
2. To understand the concepts and syntax of Programming languages.
3. To learn the basics of decision making and looping statements.
4. To learn on the manipulation of strings, arrays, functions and categories of functions.
5. To learn pointers, file management in C and customizing I/O files and dynamic memory allocations.

COURSE OUTLINE

UNIT I

15 Hrs.

Introduction: The problem solving aspect - Top down design – Implementation of Algorithms - Flow Charts - Program Verification - Efficiency of Algorithms- Analysis of Algorithms.

UNIT II

20 Hrs.

Fundamental Algorithms: Exchanging the values-Counting–Factorial Computation-Base Conversion - Factoring methods: Finding the Square root of a number-The smallest divisor of an integer – Array Techniques: Array order reversal, finding the maximum number in set-Merging, sorting and searching: The two-way merge-sorting by selection-binary search.

UNIT III

15 Hrs.

Overview of C – Constants , Variables and Data Types – Operators and Expressions - Managing Input/Output Operations – Formatted I/O – decision Making – Branching – IF, Nested IF – Switch – GOTO statements – Looping – while , do, for statements.

UNIT IV

20 Hrs.

Arrays – dynamic and multi-dimensional arrays - Character arrays and Strings - String handling Functions – user defined Functions – Categories of functions – Recursion- Structures and Unions – Array of Structures – Structures and Functions.

UNIT V

20 Hrs.

Pointers – Declaration, Accessing a variable, character strings, pointers to functions and structures – File Management in C – Dynamic Memory allocation –Preprocessors.

RECOMMENDED TEXTBOOKS:

1. R.G. Dromey,How to Solve it by Computer, Pearson Education, 2014.
2. AnanthiSheshasaayee&Sheshasaayee,C Programming, Margham Publications, 2000.

REFERENCE BOOKS:

1. Yashwantkanetkar,Let Us C , 15th Edition, BPB Publications. 2014
2. E.Balagurusamy, Programming in ANSI C, Tata McGraw Hill, 2015
3. VenuGopal and Prasad, Mastering C, Tata McGraw Hill, 2013.
4. PaulDeiteland HarveyDeitel, C How to Program, Addison Wesley, 2001.
5. Brian W. Kernighan & Dennis Ritchie, C Programming Language, PHI, 1990.

JOURNALS:

- 1.<https://www.journals.elsevier.com/science-of-computer-programming>
- 2.<https://programming-journal.org/>

E-LEARNING RESOURCES:

1. <https://www.geeksforgeeks.org/c-programming-language/>
2. https://www.tutorialspoint.com/cprogramming/c_useful_resources.htm
3. <https://www.codesdope.com/c-structure/>

4. <https://www.geeksforgeeks.org/c-programming-language/>
5. <https://fresh2refresh.com/c-programming/c-file-handling/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Gain knowledge of analyzing the efficiency of algorithms
CO 2	Analyze the concepts and syntax of Programming languages
CO 3	Gain knowledge of syntax of C and managing various Input/Output operations, the decision making and branching statements
CO 4	Understand the concept and implementation of different operations on arrays, functions, structures and unions
CO 5	Analyze file management in c with dynamic memory allocation. Understanding the concept of pointer and command line arguments

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	3	3	3	3	2
CO3	3	3	1	3	3
CO4	3	2	3	2	3
CO5	3	2	2	2	3
AVERAGE	3	2.6	2.4	2.4	2.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER I
MATHEMATICAL FOUNDATIONS

TOTAL HOURS: 90hrs

COURSE CODE: 176702

CREDITS : 3

L-T-P : 3-0-0

COURSE OBJECTIVES:

To enable the post graduate students

1. To understand the correlation and its types.
2. To develop knowledge over the statistical population and samples.
3. To recognize the univariate data through statistical measures.
4. To understand the mathematical logic notations and truth table.
5. To realize statement and Predicate calculus and their implementations.

COURSE OUTLINE:

UNIT I

Correlation coefficient – Rank Correlation coefficient of determination – Method of Least Squares – Fitting of the curve of the form $ax+b$, ax^2+bx+c , ax^3+bx^2+cx+d , ab^x and a^xb .

UNIT II

Concept of sampling – Methods of sampling – Simple random sampling – Systematic sampling and stratified random sampling (descriptions only) – concepts of sampling distributions and standard error – point estimation (concepts only) – Interval estimation of mean and proportion – Tests of Hypotheses – Critical region – Two types of Errors – Level of Significance – Power of the test.

UNIT III

Large sample tests for mean and proportion – Exact tests based on Normal, T, F and Chi-square distributions.

UNIT IV

Basic principles of experimentation – Analysis of variance – One way and two way classifications.

UNIT V

Mathematical Logic: Statement Calculus – Connectives – normal forms – Predicate Calculus – Theory of inference for statement Calculus – Predicate Calculus including theory of inference.

BOOKS FOR STUDY

1. S.P.Gupta, “Statistical Methods”, Sulthan Chand and Sons Publishers, 1993.
2. J.P. Tremblay and R. Manohar, “Discrete Mathematical Structures with Applications to Computer Science”, Tata McGraw-Hill, New Delhi, XIV edition, 1975.

REFERENCE BOOKS

1. K.S. Trivedi, “Probability and Statistics with reliability Queueing and Computer Science Applications”, Prentice Hall India, 2002.

2. J. Truss, "Discrete Mathematics for Computer Scientists", 7thEdn. Addison Wesley, Boston, 1999.
3. D.C.Sancheti , V. K . Kapoor ,Statistics (Theory , Methods and Applications),Sultan Chand & Sons , 2011

JOURNALS:

- 1.<https://www.aims sciences.org/journal/A0000-0001>
- 2.<https://link.springer.com/journal/10208>

E-LEARNING RESOURCES:

1. <https://lecturenotes.in/subject/381/mathematical-foundations-of-computer-science-mfcs>
2. https://doc.lagout.org/science/0_Computer%20Science/3_Theory/Mathematics/Discrete%20Mathematics/Mathematical%20Foundation%20of%20Computer%20Science.pdf
3. <https://www.springer.com/gp/book/9781461277927>
4. <https://www.smartworld.com/notes/mfcs-notes-pdf-mathematical-foundation-of-computer-science/>
5. <https://online.stanford.edu/courses/cs103-mathematical-foundations-computing>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Familiarize the types of correlation and co-efficient for grouped data.
CO 2	Interpret the conceptual knowledge of moments and its classification.
CO 3	Understand the functionality behind the measures of central tendency.
CO 4	Gain the insight into all the measures of dispersion.
CO 5	Thorough knowledge over mathematical logic through formulas and truth tables. Imply the theory of inference for statement and predicate calculus.

MAPPING-CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	2	2	2
CO 2	3	2	2	2	2
CO 3	3	2	2	3	2
CO 4	3	2	2	2	2
CO 5	2	2	2	3	3
Average	2.8	2	2	2.8	2.2

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture by chalk and talk,

Learning through Demonstration

Assignment, Quiz,

Peer Learning and Seminar

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER I

PRINCIPLES OF MANAGEMENT

TOTAL HOURS: 90hrs

COURSE CODE: 176703

CREDITS: 3

L-T-P: 3-0-0

COURSE OBJECTIVES:

6. To understand the basic concepts of management.
7. To study the process of Planning.
8. To study a detailed concepts of Organizational strategies.
9. To study the motivational techniques and provides the effective communication.
10. To study the standard of controlling techniques and handling the information using systems.

COURSE OUTLINE

UNIT I

15 hrs

Historical Development: Definitions of Management – Science or Art – Management and Administration - Developments of Management Thought – Contribution of Taylor and Fayol – Functions of Management – Types of Business Organizations.

UNIT II

18 hrs

Planning: Nature and purpose – Steps involved in Planning – Objectives – Setting Objectives – Process of Managing by Objectives – Strategies , Policies and Planning Premises – Forecasting – Decision Making.

UNIT III

20 hrs

Organizing: Nature and Purpose- Formal and informal Organization – Organization Chart – Structure and Process – Departmentation by Difference Strategies – Line and Staff Authority – Benefits and Limitations –De- Centralization and Delegation of Authority – Staffing – Selection Process – Techniques – HRD – Managerial Effectiveness.

UNIT IV

19 hrs

Directing: Scope – Human Factors – Creativity and Innovation – Harmonizing Objectives – Leadership – Types of Leadership –Motivation –Hierarchy of Needs- Motivation Theories – Motivational techniques – job Entertainment – Communication – Process of Communication –Barriers and Breakdowns – Effective Communication – Electronic Media in Communication.

UNIT V

18 hrs

Controlling: System and Process of Controlling – Requirements for Effective Control – The Budget as Control Technique – Information Technology in Controlling – Use of Computers in Handling the Information – Productivity – Problems and Management – Control of Overall Performance – Direct and Preventive Control – Reporting – The Global Environment – Globalization and Liberalization – International Management and Global Theory of Management.

RECOMMENDED TEXTBOOKS:

1. Harold Koontz, Helinz Weihrich, “Essentials of Management “, Tata McGraw Hill, 1999.
2. Joseph L. Massie, “Essentials of Management “, Prentice Hall Of India , Pearson IVth Edition, 2003

REFERENCE BOOKS:

1. Tripathy PC , Reddy PN, “Principles of Management”, Tata McGraw Hill fifth edition, 2012.
2. Decenzo David, Robbin Stephen.A., ”Personnel and Human Resources Management” , Prentice Hall of India , 1996
3. J.K.Mitra, “Principles of Management”, Schand Publisher, 2017
4. Dr. S.C. Saksena, “Essentials of Management “, Sahitya Bhawan Publications
5. Charles W L Hill, Steven L McShane, Tata McGraw Hill, 2007

JOURNALS:

3. Journal of Management Theories: Principles and Practices
4. Journal of Application of the Henri Fayol Principles of Management in Startup Organization

E-LEARNING RESOURCES:

1. <https://www.zamaros.net/mgt%20reading%202%20-%20history%20of%20mgt.pdf>
2. <http://nraomtr.blogspot.com/2011/12/strategies-policies-and-planning.html>
3. <https://www.businessmanagementideas.com/management/departamentation-its-concept-structure-benefits-and-other-details/493>
4. https://saylordotorg.github.io/text_organizational-behavior-v1.1/s09-theories-of-motivation.html
5. http://eeedrmcet.zohosites.com/files/IV%20Year/SEM%207/POM/POM_L46.pdf

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand and apply the basic concepts of Principles of Management systems.
CO 2	Designed the basic strategies of Planning and decision making
CO 3	Developed the selection process of organization and managerial skills
CO 4	Develop the system in the various methods of motivational techniques and effective communication.
CO 5	To provides innovative approaches and overall performance to overcome the existing problems.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-LCD)

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER I**DATABASE APPLICATION DESIGN AND DEVELOPMENT****TOTAL HOURS: 90 hrs****COURSECODE: 176704****CREDITS :3****L-T-P : 3-0-0****COURSE OBJECTIVES:**

To enable the post graduate students

- 1 To understand the basics of database, data models and various structure of SQL statements.
- 2 To draw ER models with various constraints and apply the normalization techniques.
- 3 To learn the Structured Query Language in depth to apply in programming.
- 4 To design and develop forms, reports with various features needed for an application development.
- 5 To understand the concepts of Data Administration, Backup, Recovery, Security and Privacy.
Also students gains knowledge about client Server Databases.

COURSE OUTLINE:**UNIT I****10 Hrs.**

Introduction to databases: Advantages of Database Management System- Components of a Database Management System - Other Databases- Hierarchical, Relational, Network, Object Oriented Databases -Database Design-Introduction – Designing Systems- Class Diagrams- Data Types- Events - Introduction to Large Products.

UNIT II

20 Hrs.

Data Normalization: Tables and Classes – Keys – Sample Database - 1NF - 2NF- 3NF- Boyce Codd Normal Form- Data Rules and Integrity- Effects of Business Rule- Converting the Class Diagram to Normalized tables - Data Dictionary.

UNIT III

20 Hrs.

Data Queries: Query Basics- Computations- Subtotal And Group By Having- Multiple Tables- Sub Queries- Subtraction Not In- Outer Joins- Correlated Sub Queries- SQL Select With Union, Intersect ,Except-SQL DDL Commands- SQL DML Commands.

UNIT IV

20 Hrs.

Forms and Reports: Effective Design of Reports and Forms-Form Layout- Creating Forms- Direct Manipulation of Graphical-Objects- Reports - Application Development -Application Structure- User Interface Features- Data Triggers- Transactions – Key Generation – Improving Forms To Help Users- Custom Reports- Distributing Application.

UNIT V

20 Hrs.

Database Administration And Distribution And Integration Of Data:Data Administration – Database Administration- Database Tasks By Development Stages – Backup And Recovery- Security And Privacy –Distributed Databases- Client Server Databases- Web As Client/Server System.

RECOMMENDED TEXTBOOKS:

1. Gerald V. Post, “Database Management Systems Designing and Building Business Applications”, Tata McGraw Hill International Edition, Second Edition,2005.

2. Raghu Ramakrishnan , “Database Management Systems”, 4th Edition, Tata Mcgraw Hill 2011.

REFERENCE BOOKS:

- 1 Abraham Silberschatz , Henry F. Korth , S. Sudarshan “ Database System concepts, 6th Edition, McGraw Hill Education, 2013.
- 2 Elmasri, Navathe, “Fundamentals of Database Systems”, 5th Edition, Pearson Education (2008).
3. Jeffrey A. Hoffer, Ramesh Venkataraman, , HeikkiTopi, “Modern Database Management”, Pearson Education 2016
4. C.J.Date, A.Kannan, S.Swamynathan, “An Introduction to Database Systems”, Eighth Edition, Pearson Education, 2006.
5. Mark L. Gillenson, Fundamentals of Database Management Systems, 2nd Edition, Kindle Edition

JOURNALS:

1. <https://www.journals.elsevier.com/data-and-knowledge-engineering>
2. <https://www.scimagojr.com/journalsearch.php?q=13581&tip=sid>

E-LEARNING RESOURCES:

1. <https://nptel.ac.in/courses/106105175/>
2. <http://codex.cs.yale.edu/avi/db-book/db6/slide-dir/>
3. <https://www.cse.iitb.ac.in/~sudarsha/db-book/slide-dir/>
4. <https://www.coursera.org/learn/database-management>
5. <https://www.coursera.org/learn/core-database>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Understand the fundamentals of the database and data models and SQL
CO 2	Design a database using ER diagrams and map ER into Relations and compare the normalized relations by I NF, II NF, III NF, IV NF and BCNF
CO 3	Ability to frame all possible queries to the database in order to retrieve information in required form.
CO 4	Acquire the knowledge of developing forms and reports needed in the application development
CO 5	Acquiring knowledge about the concepts of Data Administration ,Backup, Recovery, Security and Privacy

MAPPING-CO with PSO:

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	2	3	2	3	2
CO 2	2	3	3	3	3
CO 3	3	2	2	2	2
CO 4	3	2	2	3	3
CO 5	2	3	3	2	3
Average	2.4	2.4	2.4	2.6	2.6

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-LCD)

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER I

OFFICE AUTOMATION AND INTERNET APPLICATIONS – LAB

TOTAL HOURS: 90 Hrs.

COURSE CODE: 186808

CREDITS: 3

L-T-P: 0-0-3

COURSE OBJECTIVES:

1. To provide hands-on use of Microsoft Office applications Word, Excel, Access and PowerPoint.
2. To provide assignments to provide MS Office applications knowledge and skills.
3. To provide students with skills on good presentation preparation using MS Power Point.
4. To provide hands-on experience on the use HTML to web page development.
5. To provide knowledge on technical languages of computers that is related with business in the modernized world.

COURSE OUTLINE

90 Hrs.

MS-WORD

1. Text Manipulation
2. Paragraph formatting
3. Working with Tables
4. Page formatting
5. Working with Clip-arts

MS-EXCEL

6. Working with Formulae
7. Cell-alignment
8. Working with Charts
9. Conditional formatting
10. Working with Pictures

MS-POWERPOINT

11. Text formatting
12. Working with Charts
13. Animation

14. Sound effects
15. Slide sorter

HTML

16. Working with Text
17. Working with Image
18. Working with Page Links
19. Working with Frames

RECOMMENDED TEXTBOOKS:

1. Computer Applications in Business and Management, AnanthiSheshasaayee and Sheshasaayee, Margham publications, 2004
2. Ivan Bayross, “Web Enabled Commercial Application Development using HTML, JavaScript, DHTML and PHP”, BPB Publications, 4th Revised Edition, 2009.

REFERENCE BOOKS:

1. Alan Simpson, “Easy Guide to Windows”, BPB, 1995
2. Mansfield, The Compact Guide to Ms–Office, BPB, 1994
3. [Bittu Kumar](#), “Mastering MS Office: Computer Skill Development - Be Future Ready”, V&S Publishers, 2017
4. Sangeeta Panchal, Alka Sabharwal, “Foundations of Information Technology”, Oxford University Press (2013)
5. Prof. Satish Jain, “Computer Course Windows 10 with MS Office 2016”, BPB

JOURNALS:

3. International Journal of Computer Science and Programming Language
4. International Journal of Engineering and Computer Science

E-LEARNING RESOURCES:

6. <https://www.pdfdrive.com/microsoft-office-365-office-2016-introductory-d183889679.html>
7. <https://www.pdfdrive.com/microsoft-office-365-excel-2016-e178323342.html>
8. <https://library.ku.ac.ke/wp-content/downloads/2011/08/Bookboon/Office-programs/microsoft-office-word.pdf>
9. <https://library.ku.ac.ke/wp-content/downloads/2011/08/Bookboon/Office-programs/microsoft-office-powerpoint.pdf>
10. <https://wtf.tw/ref/duckett.pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Describe the usage of computers and why computers are essential components in business and society
CO 2	Apply technical knowledge and perform specific technical skills using MS Office
CO 3	Apply the learning of MS Excel in using various formulae for calculations, creating charts.
CO 4	Apply technical knowledge gained about MS Power point in doing presentations.
CO 5	Utilize the Internet Web resources by creating web pages

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	3	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	2	2.4	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture by Chalk and Talk

Learning through Demonstrations

Assignments

SEMESTER I
C PROGRAMMING LAB

TOTAL HOURS: 90 Hrs.

COURSE CODE: 176706

CREDITS: 3

L-T-P: 0-0-3

COURSE OBJECTIVES:

1. Read, understand and trace the execution of programs written in C Language.
2. To be able to write, compile and debug programs in C
3. Write C code for the given algorithm.
4. To be able to effectively choose programming components to solve computing problems in real-world.
5. Implement Programs with pointers and arrays, perform pointer arithmetic and File concepts.

COURSE OUTLINE

1. Assignment Statement programs
2. Program using Control Structures
3. Program using Looping Structures

4. Programs using Characters
5. Program using Strings
6. Implementation of Single Dimensional Array
7. Implementation of Two-Dimensional Array
8. Working with Pointers
9. Working with User Defined Functions
10. Implementation using Recursion
11. Implementation of call-by- value
12. Implementation on Call-by-reference
13. Implementation of Structures
14. Implementation of unions
15. Working with the Files

RECOMMENDED TEXTBOOKS:

1. AnanthiSheshasaayee&Sheshasaayee, “ C Programming ”, Margham Publications, 2000
2. E.Balaguruswamy, “Programming in ANSI C” , MC Craw Hill, Seventh Edition, 2016.

REFERENCE BOOKS:

1. B.W.Kernighan and D.M.Ritchie ,”The C programming language”, PHI, 2012
2. H.Schildt, “C: The Complete Reference”, TMH, Fourth Edition, 2012.
3. Gottfried,B.S., “Programming with C”, Schaum’s Outline Series, Third Edition, TMH, 2010
4. Kanetkar Y., Let us C, BPB Pub., New Delhi, 1999.
5. Gottfried B.S., Programming with C, Second Edition, TMH Pub. Co. Ltd., New Delhi, 1996.

JOURNALS:

5. National research paper on C language -IJIRT
6. International Journal of Computer Science and Programming Language

E-LEARNING RESOURCES:

1. <https://www.codesdope.com/c-operators/>
2. <https://www.codesdope.com/c-decide-ifelse/>; <https://www.codesdope.com/c-loop-and-loop/>
3. <https://www.codesdope.com/c-my-functions/>
4. <https://www.codesdope.com/c-array/>; <https://www.codesdope.com/c-structure/>;
<https://www.codesdope.com/c-string/>
5. <https://www.codesdope.com/c-point-me/>; <https://www.codesdope.com/c-enjoy-with-files/>

COURSE OUTCOMES:

CO Number	CO STATEMENT

CO 1	Apply the basic fundamentals of C programming language.
CO 2	Explain various decision making statements and iterative statements to solve a problem.
CO 3	Explain the use of functions and recursions to find solution to a problem.
CO 4	To apply different operations on arrays and manipulations on Strings and Structures, to apply the use of pointers and file operations in C programming language.
CO 5	To be able to reduce the number of lines of code, memory space and time by selecting appropriate data structures to solve the problem using C.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	3	3	2
CO2	1	3	3	3	2
CO3	2	3	3	2	1
CO4	2	2	3	3	2
CO5	2	2	3	3	1
AVERAGE	1.8	2.6	3	2.8	1.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture by Chalk and Talk

Learning through Demonstrations

SEMESTER II

OBJECT ORIENTED PROGRAMMING AND DATA STRUCTURES

TOTAL HOURS: 90 Hrs.

COURSE CODE: 176707

CREDITS: 3

L-T-P: 3-0-0

COURSE OBJECTIVES:

1. To understand the object oriented concepts.
2. To learn, understand and implement the basic concepts of Object oriented concepts
3. To apply the generic programming features Design and development of object oriented snippets to achieve reusability
4. To design, execute the various operations of Data structures as well as to analyze and apply the Tree
5. To know the various operations on Graph data structure and its applications

COURSE OUTLINE

UNIT I

15hrs

Object Oriented Programming Fundamentals C++; Programming features - Data Abstraction - Encapsulation - class - object - constructors - static members – constant members – member functions – pointers – references - Role of this pointer – Storage classes – function as arguments.

UNIT II

20hrs

Object Oriented Programming Concepts: String Handling – Copy Constructor - Polymorphism – compile time and run time polymorphisms – function overloading – operators overloading – dynamic memory allocation - Nested classes - Inheritance – virtual functions.

UNIT III

15hrs

C++ Programming Advanced Features: Abstract class – Exception handling - Standard libraries - Generic Programming - templates – class template - function template – STL – containers – File handling concepts.

UNIT IV

20hrs

Advanced Linear And Non-linear Data Structures: Linked List – Stack and Queue Implementation - Trees – Binary Tree Representation and Implementation – Binary Search Tree Implementation – Threaded Binary Tree – Balanced Search Tree - AVL trees Basic operations– B-Trees Basic operations – Red-Black trees Basic operations – Splay trees Basic operations

UNIT V

20hrs

GRAPHS: Graphs - Representation of Graphs – Graph Traversal – Topological sort – Minimum Spanning Trees – Kruskal and Prim algorithm – Shortest path algorithm – Dijkstra's algorithm.

RECOMMENDED TEXT BOOKS

1. K. S. Easwara Kumar, "Object Oriented Data Structures Using C++", Vikas Publishing House Pvt. Ltd., 2012.
2. Bjarne Stroustrup, "The C++ Programming Language", Pearson Education, 3rd Edition, 2007.
3. E.Horowitz, S.Sahni and Mehta, Fundamentals of Data structures, TMH, 2015

REFERENCE BOOKS

1. E. Balagurusamy, "Object Oriented Programming with C++", Tata McGraw-Hill, fifth Reprint, 2012.
2. Herbert Schildt, "The complete reference C++", McGraw-Hill Education, Fourth Edition, 2000.
3. Jean Paul Tremblay, Paul G.Sorenson, An Introduction to DataStructures with Applications ,TMH,1995.
4. YashvantKanetkar, "Let us C++", BPB Publishers, 2010.
5. AnanthiSheshasaayee&Sheshasaayee, "C++ Programming", Margham Publications, 2006.

JOURNALS:

1. International Journal of Data Structures
2. Journal of Computer and System Sciences

E-LEARNING RESOURCES:

1. <https://www.udemy.com/course/c-programming-a-z>
2. <https://hackr.io/tutorials/learn-c-plus-plus>
3. <http://www.cplusplus.com>
4. <http://cs-fundamentals.com/data-structures/introduction-to-data-structures.php>
5. <https://www.w3schools.in/data-structures-tutorial/data-structures-arrays/>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Gain a clear understanding of the basic concepts of C++along with their implementations.
CO 2	Gaining knowledge in developing secured object oriented application using protected members

CO 3	Acquirement of technical skills to elucidate the overloading mechanism.
CO 4	Understand ,implement the operations of linear data structures Design their own data structure according to the application need Apply the tree operations in real time
CO 5	Graph operations in real time Develop any application using the data structures

MAPPING- CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	2	2	2	2	2
CO 2	3	3	2	2	2
CO 3	3	2	3	2	2
CO 4	3	3	3	3	3
CO 5	3	2	2	2	3
Average	2.8	2.4	2.4	2.2	2.4

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY

Lecture by chalk and talk.

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER II

BUSINESS INTELLIGENCE

TOTAL HOURS: 90 Hrs.

COURSE CODE: 176708

CREDITS: 3

L-T-P: 3-0-0

COURSE OBJECTIVES:

6. To study the intelligence and ethics in business
7. To study the evolution and definition of information systems
8. To formulate the mathematical model and methods.
9. To explore the various analysis.
10. To apply the marketing models and case studies.

COURSE OUTLINE

UNIT I

20 Hrs.

Business Intelligence: Effective and timely decision – Data, information and knowledge – The role of mathematical models – Business Intelligence Architectures – Ethics and Business Intelligence.

UNIT II

20 Hrs.

Decision support systems: Definition of system – Representation of the decision making process – Evolution of information systems – Definition of decision support system – Development of a decision support system

UNIT III

15 Hrs.

Mathematical model and methods: Structure of mathematical models – Development of a model – Classes of models

Data preparation: Data validation – Data transformation – Data reduction

UNIT IV

15 Hrs.

Data Exploration: Univariate analysis – Bivariate analysis – Multivariate analysis

UNIT V

20 Hrs.

Marketing models: Relational marketing – Salesforce management – Business case studies

CASE STUDY: Implementation of the methods/techniques used in the base paper selected.

RECOMMENDED TEXTBOOKS:

1. Carlo Vercellis, "Business Intelligence - Data Mining and Optimization for Decision Making", Wiley, 2013.
2. Efraim Turban, Ramesh Sharda, Dursun Delen, "Decision Support and Business Intelligence systems", Pearson, 9th Edition, 2014.

REFERENCE BOOKS:

1. CindiHowson, "Successful Business Intelligence", McGraw Hill Education Pvt. Ltd., Second Edition, 2014.
2. Larissa T. Moss, S. Atre, "Business Intelligence Roadmap: The Complete Project Lifecycle of Decision Making", Addison Wesley, 2003.
3. David Loshin Morgan, Kaufman, "Business Intelligence: The Savvy Manager's Guide", Second Edition, 2012.
4. Business Intelligence and Analytics: "Systems for Decision Support" – DursunDelen, Efraim Turban, Ramesh Sharda and Ting-Peng Liang.
5. Business Intelligenc: The Savvy Manager's Guide, Getting Onboard with Emergint IT by David Loshin

JOURNALS:

1. International Journal of Business Intelligence Research (IJBIR)
2. International Journal of Business Intelligence and Data Mining

E-LEARNING RESOURCES:

- 1.<https://www.prolifics.com/blog/business-driven-approach-validating-business-intelligence>
2. <https://study.com/academy/lesson/how-mathematical-models-are-used-in-business.html>
- 3.<https://acadndtechy.files.wordpress.com/2015/07/business-intelligence-carlo-vercellis-john-wiley-sons-2009-edition-isbn-978-0-470-51138-1.pdf>
- 4.<http://onlinecollege.org/2011/10/03/20-classic-case-studies-every-business-student-should-know/>
5. <https://www.theanalysisfactor.com/multiple-regression-model-univariate-or-multivariate-glm/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Identify the major frameworks of computerized data analytics and business intelligence
CO 2	Analyze the evolution, definitions and capabilities of business intelligence.
CO 3	Formulating the mathematical and logical based analytics
CO 4	Categorize various analysis on location based analytics, social networking and predictive analytics

CO 5	Applying the marketing methods and case studies.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-LCD)

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER II
DESIGN AND ANALYSIS OF ALGORITHMS

TOTAL HOURS : 90 Hrs

COURSE CODE : 176709

CREDITS : 3

L-T-P : 3-0-0

COURSE OBJECTIVES:

1. Analyze the asymptotic performance of algorithms.
2. Write rigorous correctness proofs for algorithms.
3. Demonstrate a familiarity with major algorithms and data structures.
4. Apply important algorithmic design paradigms and methods of analysis.
5. Synthesize efficient algorithms in common engineering design situations.

COURSE OUTLINE:

UNIT I

15 Hrs.

Introduction - Definition of Algorithm – pseudocode conventions – recursive algorithms – performance analysis: time and space complexity –Asymptotic Notations-practical complexities – Randomized algorithms: An informal Description – Identifying repeated element – primality testing- Advantages and Disadvantages.

UNIT II

20 Hrs.

Divide and Conquer: General Method – Defective Chessboard- -Binary Search-Finding the maximum and minimum – merge sort – Quicksort-Selection-Strassen's matrix multiplication – Greedy Method: General Method – Container loading- knapsack problem-Tree vertex splitting-Job sequencing with deadlines–optimal storage on tapes.

UNIT III

15 Hrs.

Dynamic Programming: General Method - multistage graphs – all pair's shortest paths – single source shortest paths - String Editing – 0/1 knapsack. Traversal and Search techniques: DFS-BFS-connected components and spanning trees and spanning trees – bi-connected components and DFS.

UNIT IV

20 Hrs.

Back Tracking: General Method – 8-queens problem - Sum of subsets - Graph Coloring – Hamiltonian cycles. Branch and Bound: General Method - Traveling Salesperson problem.

UNIT V

20 Hrs.

Lower Bound Theory: Comparison trees - Oracles and adversary arguments - Lower bounds through reduction - Basic Concepts of NP-Hard and NP-Complete problems.

RECOMMENDED TEXTBOOKS:

1. Ellis Horowitz, SaratjSahni and SanguthevarRajasekaran, "Fundamentals of Computer Algorithms", Universities Press, 2015.
2. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Third Edition,Pearson Education, 2012.

REFERENCE BOOKS

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms", PHI, 2014.
2. A.V. Aho, J.E. Hopcroft, J.D. Ullmann, " The Design and Analysis of Computer Algorithms", Pearson Education, 2002.

JOURNALS:

1. journal-of-algorithms
2. Algorithms

E-LEARNING RESOURCES:

- 1 <https://nptel.ac.in/courses/106101060/>
- 2 <https://nptel.ac.in/courses/106/101/106101060/>
- 3 <http://www.ics.uci.edu/~goodrich/teach/cs161/notes/>
- 4 <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-046j-design-and-analysis-of-algorithms-spring-2012/lecture-notes/>
- 5 http://www.vssut.ac.in/lecture_notes/lecture1428551222.pdf

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Gain a clear understanding of the algorithm and basic frame work of algorithm development. Learn to implement the algorithm notations.
CO 2	Gain knowledge to understand the basic problems and problem solving techniques.
CO 3	Learn to solve graph related problems and write algorithms.
CO 4	Understanding the steps to involve and design algorithm for Flow Problem and Bipartite Graph problems
CO 5	Learn limitations of Algorithm and Approximation Algorithms and solve practical problems.

MAPPING : COURSE OUTCOME WITH PROGRAM SPECIFIC OUTCOMES

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	1	2	2
CO 2	2	2	2	2	2
CO 3	2	2	2	2	2
CO 4	3	3	3	2	2
CO 5	3	3	3	2	2
Average	2.4	2.4	2.2	2	2

**KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY
CORELATED-1 NO CORELATION-0**

TEACHING METHODOLOGY:

- Lecture by chalk and talk,
- Assignment
- Peer Learning.

QUESTION PAPER PATTERN:

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER II

OPERATING SYSTEM CONCEPTS AND SHELL PROGRAMMING

TOTAL HOURS: 90 Hrs

COURSE CODE: 176710

CREDITS: 3

L-T-P: 3-0-0

COURSE OBJECTIVES:

1. To aware the fundamental principles of processes and operating system, the various functions of process management.
2. To comprehend memory management and file management.
3. To understand the Unix operating system.
4. To know about the file management and file system.
5. To learn Shell programming and scripts.

COURSE OUTLINE

UNIT I

20 Hrs.

Introduction: Definition-Views-Goals- Process management: Process Concepts-Process Scheduling-Cooperating Processes-Inter-process communication. Process Scheduling: Basic concepts-Scheduling Criteria-Scheduling Algorithms- Synchronization: Critical-Section Problem-Synchronization hardware- Mutex Locks- Semaphores-Classical Problems of Synchronization-Monitors-Deadlocks: Characterization-Methods of handling deadlocks-Deadlock Prevention –Avoidance Detection-Recovery.

UNIT II

20 Hrs.

Memory Management Strategies: Background-Swapping- Contiguous memory allocation-Non-Contiguous Allocation: Segmentation-Paging-Structure of the page table-Virtual Memory Management: Demand Paging-Page Replacement-Page Replacement Algorithms-Thrashing-File-System: File concepts-Access methods-Directory and Disk Structures- Implementing File System: File System structures-Allocation Methods-Free space management.

UNIT III

15 Hrs.

UNIX: The Unix Operating System-A brief session on Unix-The Unix Architecture-Features of Unix-Locating Commands-Internal and External commands-Command Structure-General Purpose Utilities: cat, date, echo, printf, bc, mailx, passwd, who, uname, tty, stty, Changing the settings, The File System:

Introduction-types of files-file name-the parent-child relationship –file handling commands: HOME variable, pwd, cd, mkdir, rmdir-Absolute pathnames and Relative path names-listing directory contents.

UNIT IV

15 Hrs.

Handling Files: commands for handling ordinary files-displaying-creating files-copying files- deleting files- renaming files-paging output-printing file-knowing file types- counting lines- word and characters- displaying data in octal- comparing two files- common in two files- converting between DOS and UNIX-compressing and decompressing files.

UNIT V

20 Hrs.

The Shell: the Shell's Interpretive cycle-pattern matching-the wild card characters-Redirection-Three standard files-command substitution-shell variables-Essential Shell Programming: Shell scripts- read-command line arguments- exit- logical operators- the if conditional-using test-case conditional-computation and string handling-Looping: while, for-manipulating the positional parameters- the Here document-interrupting a program-Debugging shell scripts.

RECOMMENDED TEXTBOOKS:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gange, Operating system Concepts, John Wiley & Sons, Ninth Edition, 2016.
2. Sumitabha Das, Unix Concepts and Applications, Tata McGraw –Hill, 2012.

REFERENCE BOOKS:

1. AchyutGodbole,Operating Systems: With Case Studies in UNIX, Netware, Windows NT, Tata-McGraw Hill, 2011.
2. Stuart E Madnick and John J Donovan,Operating Systems, TATA McGraw HILL, 2001.
3. Dhananjay M Dhamdhare,Operating systems A concept based approach, 3rd edition, TATA McGraw HILL, 2012.
4. H.M.Deitel, An Introduction to operating system, 2nd Edition, Addison Wesley, 1990.
5. Brian W.Kernighan, Rob Pike, The Unix Programming Environment, Pearson Education, 2002.

JOURNALS:

- 1.<http://stmjournals.com/Journal-of-Operating-Systems-development-and-Trends>
- 2.<https://www.elsevier.com/catalog/computer-science/software/operating-systems>

E-LEARNING SOURCES

1. <http://www.ics.uci.edu/~ics143/lectures.html>
2. http://www.shsu.edu/csc_tjm/cs431/shellprog.html
3. <https://www.coursera.org/courses?query=operating%20system>
4. <https://www.udacity.com/course/introduction-to-operating-systems--ud923#>
5. <https://www.coursera.org/lecture/technical-support-fundamentals/memory-management-CKcxg>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand the operating system components and its services, process management
CO 2	Able to demonstrate the functions of memory management.
CO 3	Able to understand the Unix operating system
CO 4	Apply file management concepts.
CO 5	Able to understand programming using shell.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	2	2
CO2	2	2	3	2	2
CO3	3	3	1	3	3
CO4	3	1	3	2	2
CO5	2	2	2	2	3
AVERAGE	2.6	2.2	2.4	2.2	2.4

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER II

APPLICATIONS OF MATHEMATICAL FOUNDATIONS USING C - LAB

TOTAL HOURS: 90 Hrs.

COURSE CODE: 176712

CREDITS: 3

L-T-P: 0-0-6

COURSE OBJECTIVES:

11. To write and execute the programs using C
12. To study fundamental concepts of mathematics, definitions, functions and relations
13. To improve the data analytical skills with the help of permutations and combinations.
14. To test the hypothesis and data interpretations and apply principles of discrete probability
15. To calculate probabilities and expectations of simple random processes.

COURSE OUTLINE

Programs on:

1. Correlation coefficient & Rank Correlation coefficient (15 Hours)
2. Method of Least Squares – Fitting of the curve of the form $ax+b$, ax^2+bx+c , ax^3+bx^2+cx+d , ab^x and a^xb . (20 Hours)
3. Large sample tests for mean and proportion – using Normal, T, F and Chi-square distributions. (20 Hours)
4. Analysis of variance – One way and two way classifications. (15 Hours)

5. Construction and generation of truth variables upto four variables. (20 Hours)

CASE STUDY: Implementation of the methods/techniques used in the base paper selected.

TOOLS: TURBO C

RECOMMENDED TEXTBOOKS:

1. I.S.P.Gupta, "Statistical Methods", Sulthan Chand and Sons Publishers, 1993.
2. J.P. Tremblay and R. Manohar, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw-Hill, New Delhi, XIV edition, 1975.

REFERENCE BOOKS:

- 1.K.S. Trivedi, "Probability and Statistics with reliability Queueing and Computer Science Applications", Prentice Hall India, 2002.
2. J. Truss, "Discrete Mathematics for Computer Scientists", 7thEdn., Addison Wesley, Boston, 1999.
3. "Correlation and Regression Analysis "- By Dr. Mohamed Ahmed Zaid , Published in SESRIC in 2015
4. Cognitive Agent-based Computing, A unified framework for modeling complex adaptive systems using Agent-based & Comple Network-based Methods by "Muaz A Niazi, Amir Hussain, Springer Science & Business Media
5. Discrete Mathematics: An Open Introduction, 3rd edition – Oscar Levin Publication

JOURNALS:

1. International Journal of Mathematical Education in Science and Technology
2. International Journal of Trends in Mathematics Education Research

E-LEARNING RESOURCES:

- 1.<https://www.statisticshowto.datasciencecentral.com/probability-and-statistics/correlation-coefficient-formula/>
2. <http://mathworld.wolfram.com/LeastSquaresFitting.html>
3. <https://www.statisticshowto.datasciencecentral.com/probability-and-statistics/chi-square/>
4. <https://www.springer.com/gp/book/9781461421337>
5. http://discrete.openmathbooks.org/dmoi3/sec_intro-statements.html

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Synthesizing simple programs by induction proofs.
CO 2	Finding the possible outcomes of permutations and combinations.
CO 3	Calculating discrete distributions and expectations
CO 4	Formulating the concepts of standard distributions
CO 5	Designing the hypothesis in optimal way

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Using Computers in the Lab

SEMESTER III**OBJECT ORIENTED ANALYSIS AND DESIGN**

TOTAL HOURS: 90 Hrs

COURSE CODE: 176713

CREDITS: 3

L-T-P: 3-0-0

COURSE OBJECTIVES:

- 1.To know the importance of modeling concept for object orientation in system development.
- 2.To develop the system using Unified Modeling Language (UML).
3. To specify, analyze and design the use case driven requirements for a particular system.
- 4.To apply UML for representation of an object-oriented system using different modeling views.
5. To impart knowledge about quality assurance tests and its strategies.

COURSE OUTLINE

UNIT I

15 Hrs.

An overview of Object-Oriented Systems Development-views-methodology-Object Basics- Object Oriented Systems Development Lifecycle-introduction-development process- use case driven approach.

UNIT II

20 Hrs.

Rumbaugh Methodology- Booch Methodology- Jacobson Methodology-Patterns-Frameworks-Unified Approach-Unified Modeling Language-Introduction-UML class diagram- Use case Diagram- Interaction Diagram- Sequence Diagram- Collaboration Diagram- State Diagram- Activity Diagram- Package Diagram.

UNIT III

20 Hrs.

Identifying Use Cases - Object Analysis – Classification - Identifying Object Relationship - Attributes and Methods-Associations - Super-sub class-A-part-of relationship aggregation - Identifying Attributes and Methods, Defining attributes by analyzing use cases and UML diagrams-Methods and Messages.

UNIT IV

20 Hrs.

Design Process- Design Axioms – Corollaries- Designing Classes –Refining Attributes-Designing methods and protocols- Access Layers – Object storage –Object Interoperability-View Layer- Designing interface objects.

UNIT V

15 Hrs.

Designing Interface Objects – Software Quality Assurance – Testing Strategies- Impact–System Usability – Measuring User Satisfaction-Usability Testing.

RECOMMENDED TEXTBOOKS:

1. Ali Bahrami, Object Oriented Systems Development, Tata McGraw-Hill, 2008.
2. Stephen R.Schaach, “Introduction to Object Oriented Analysis and Design”, Tata McGraw-Hill, 2004.

REFERENCE BOOKS:

1. Craig Larman, Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development, Third Edition, Pearson Education, 2005.
2. James Rumbaugh, Ivar Jacobson, Grady Booch, The Unified Modeling Language Reference Manual, Addison Wesley, 2nd edition, 2005.
3. Mark Priestley, Practical Object-Oriented Design with UML, Tata McGraw Hill, second Edition, 2005.
4. Meilir Page-Jones, Fundamentals of Object Oriented Design in UML, Pearson Education, 2003.
5. Atul Kahate, Object Oriented Analysis & Design, Tata McGraw Hill, 2004.

JOURNALS:

1. Journal of Engineering Education Transformations
2. International Research Journal of Computer Science

E-LEARNING RESOURCES:

1. https://www.tutorialspoint.com/object_oriented_analysis_design/ooad_object_oriented_model.html
2. <https://www.uml-diagrams.org/uml-object-oriented-concepts.html>
3. <https://www.techopedia.com/definition/21104/object-oriented-analysis-and-design-ooad>
4. <https://airbrake.io/blog/design-patterns/object-oriented-analysis-and-design>
5. <https://study.com/academy/lesson/five-basic-concepts-of-object-oriented-design.html>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Recognize the concepts and principles of OOAD

CO 2	Understand the purpose, major components of Class and Object diagrams.
CO 3	Analysis, design, document the requirements through use case driven approach.
CO 4	Apply UML for representation of an object-oriented system using different modeling.
CO 5	Apply the different quality assurance tests and its strategies

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	2	2	3	2	2
CO 2	3	2	2	3	2
CO 3	3	3	1	3	3
CO 4	3	3	3	2	3
CO 5	3	1	3	2	3
AVERAGE	2.8	2.2	2.4	2.4	2.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-LCD)

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER III

SOFTWARE PROJECT MANAGEMENT

TOTAL HOURS:90Hrs

COURSE CODE: 176714

CREDITS: 3

L-T-P: 3-0-0

COURSE OBJECTIVES:

1. To know of how to do project planning for the software process.
2. To learn the cost estimation techniques during the analysis of the project.
3. To understand the quality concepts for ensuring the functionality of the software
4. To learn risk management.
5. To understand Managing People and Organizing Teams

COURSE OUTLINE:

UNIT I

15 Hrs.

Introduction to Software Project management – Software Project Vs Other types of Project – Problems – management Control – Stake Holders – Requirement Specification – Information and Controlling Organization – Introduction - to Step wise Project Planning – Select - Identify Scope and Objectives – Identify Project Infra Structure – Analyze Project Characteristics – Products and Activities - Estimate Effort for each activity – Identify Activity Risk – Allocate Resource – review Publicize Plan – Execute Plan and Lower Levels of Planning. Project Evaluation – Introduction – Strategic Assignment – Technical Assessment – Cost Benefit Analysis – Cash Flow Forecasting – Cost Benefit Evaluation Technique – Risk Evaluation.

UNIT II

15 Hrs.

Selection of a Appropriate Project Approach – Choosing Technologies – Technical Plan contents – List – Choice of Process Model – Structured Methods – Rapid Application Development – Water fall Model – V Process Model – Spiral Model – Software Prototyping – Ways of Categorizing Prototypes – Tools – Incremental Delivery – Selecting Process models.

UNIT III

20 Hrs.

Software Effort Estimation – Introduction – where – Problem with over and under estimates – Bases for software estimating – Software Estimation Technique – Expert Judgment – Albrecht Function Point Analysis – Function Point Mark II – Object Points – Procedural Code Oriented Approach – COCOMO – Activity Planning – Objectives – Project Schedules – Project and Activities – sequencing – representing lagged activities – forward pass – backward pass – Identifying the Critical path – Activity float – Shortening project duration – Identifying Critical activities - precedence Networks.

UNIT IV

20 Hrs

Risk Management – nature of Risk - Managing - analysis – reduction – evaluating – Resource Allocation – nature of resources – Requirements – Scheduling critical path – Counting the cost – resource schedule – Cost schedule – Scheduling sequence – Monitoring and control – Creating the frame work – collecting the data – visualizing the progress – cost monitoring – earn Value – prioritizing monitoring change control.

UNIT V

20 Hrs

Managing Contracts – Types of Contracts – Stages of Contracts – terms of Contracts – Contract Management – Acceptance. Managing People and Organizing Teams – Organizational Behavior Background – Selecting the right person for the job – Instructions in the best method – motivation – decision making – Leadership – Organizational Structure – Software Quality – Importance – Defining

– ISO 9126 – Practical measures – Product Vs process Quality Management – External Standards – Techniques – to help enhance software quality.

RECOMMENDED TEXTBOOKS:

1. Bob Hughes & Mike Cotterell, “Software Project Management”, Tata McGraw- Hill Publications, Fifth Edition 2012
2. Futrell , “Quality Software Project Management”, Pearson Education India, 2008

REFERENCE BOOK

1. Andrew Stellman and Jennifer Greene,”Applied software project management “, O’Reily, 2005.
2. Walker Royce, “Software Project Management”, Edison Wesley.
3. Gobalswamy Ramesh, “Managing Global Software Projects”, Tata McGraw Hill Publishing Company, 2003
4. Richard H.Thayer “Software Engineering Project Management”, IEEE Computer Society
5. S. A. Kelkar,” Software Project Management” PHI, New Delhi, Third Edition ,2013

JOURNALS:

1. <https://www.sciencedirect.com/science/article/pii/S2212017315002491>
2. <https://ieeexplore.ieee.org/document/6772420>

E-LEARNING RESOURCES:

- 1 <https://nptel.ac.in/courses/106/105/106105218/>
- 2 <https://www.smartzworld.com/notes/software-project-management-pdf-notes-spm-pdf-notes/>
- 3 <https://www.coursera.org/learn/software-processes>
- 4 <https://www.coursera.org/learn/uva-darden-project-management>
<https://www.coursera.org/learn/introduction-to-software-product-management>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Lear basic project management concept. Gain knowledge about quality standards.

CO 2	Learn software coasting models. Know about the tools regarding process models.
CO 3	Gain knowledge about software project planning, scheduling and estimation.
CO 4	Gain knowledge about risk management process. Know the importance of coast scheduling and monitoring.
CO 5	Know about the organizational structure and human resource.

MAPPING-CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	2
CO 2	2	2	2	2	3
CO 3	2	2	2	2	3
CO 4	2	2	2	2	3
CO 5	2	2	2	2	3
Average	2	2	2	2	2.8

KEY: STRONGLY CORELATED-3, MODERATELY CORELATED-2, WEAKLY CORELATED-1, NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk)

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER III

RESOURCE MANAGEMENT TECHNIQUES

TOTAL HOURS: 90Hrs.

COURSE CODE: 176715

CREDITS:3

L-T-P: 3-0-0

COURSE OBJECTIVES:

1.To study and understand the basics of Operations Research and Linear Programming Problem with their methods.

- 2.To develop Computational Skills
- 3.To develop Logical thinking in formulating industry oriented problems.
- 4.To apply these techniques in real life situations.
- 5.To understand, analyze and solve the various models in Transportation, Assignment, Sequencing and Networking problem.

COURSE OUTLINE

UNIT I

20 Hrs.

Principle components of decision problem – modeling phases – LPP formulation & graphic solution – resource allocation problems – simplex method – Artificial Variable Techniques.

UNIT II

20 Hrs.

Transportation models: Definition – formulation and solution of transportation models – North West Corner Rule, the row minima, column minima, matrix minima and Vogel's approximation methods.

UNIT III

15 Hrs.

Assignment model: Definition of Assignment model comparison with transportation model – formulation and solution of Assignment model – variations of Assignment problem.

UNIT IV

15 Hrs.

Sequencing problem: Processing each n jobs through 2 machines – processing n jobs through 3 machines – processing n jobs through m machines – Travelling Salesman problem.

UNIT V

20 Hrs.

Network diagram representation – CPM – time charts & resource leveling – PERT.

RECOMMENDED TEXTBOOKS:

1. Sundaresan. V, Ganapathy Subramanian K S, Ganesan K, "Resource Management Techniques", A.R. Publications, Fourth Edition, 2009
2. Kalavathy S, "Operations Research", VIKAS Publications, Second Edition, 2007

REFERENCE BOOKS:

1. Anderson, "Quantitative methods for business", Thomson learning, Eighth edition, 2002
2. Winston, "Operations research", Thomson learning, 2003
3. H. A. Taha, "Operations Research", PHI, 2002.
4. KantiSwarup , P.K. Gupta , Man Mohan , " Operations Research ", Sultanchand ,2014.
5. Hamdy. A. Taha, "Operations Research- An Introduction", Pearson publications, Tenth Edition, 2017.

JOURNALS:

1. International Journal of Operational Research
2. Journal of the Operational Research Society

E-LEARNING RESOURCES:

1. http://www.pondiuni.edu.in/storage/dde/downloads/mbaii_qt.pdf
2. <https://www.slideshare.net/beautifulneha/transportation-problem-in-operational-research>
3. https://www.zeepedia.com/read.php?assignment_problems_solution_of_an_assignment_problem_operations_research&b=66&c=37
4. <http://www.universalteacherpublications.com/univ/ebooks/or/Ch14/intro.htm>
5. <https://www.youtube.com/watch?v=vUMGvpsb8dc>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Formulate and solve Linear Programming Problem in different situations like production, distribution of goods and economics that needs decision.
CO 2	Interpret and apply various transportation methods to solve the issues regarding transfer of goods to obtain the maximum profit.
CO 3	Explore the usage and applications of assignment problem to obtain optimal solution for business decision problems.
CO 4	Determine the effectiveness of solving sequencing problem to synchronize with the latest trends and demands from the industry.
CO 5	Construct network diagrams and implement PERT and CPM methods to plan, schedule and control project activities to meet the needs of corporate sector.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	2	2	3
CO2	2	3	2	3	3
CO3	2	3	3	3	3
CO4	3	2	3	3	2
CO5	3	3	3	3	3
AVERAGE	2.4	2.6	2.8	2.8	2.8

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-LCD)

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER III
ASP.NET PROGRAMMING

TOTAL HOURS: 90Hrs.

COURSE CODE: 176716

CREDITS:3

L-T-P: 3-0-0

COURSE OBJECTIVES:

- 1.To study the understand the fundamentals of developing modular application by using object oriented methodologies.
- 2.To create ASP.Net applications using standard .net controls.
- 3.To set up and configure programming environment for ASP.net programs.
- 4.To study the OLEDB and SQL Server Database.
- 5.Develop a data driven web application.

COURSE OUTLINE

UNIT I

20 Hrs.

ASP.NET Language Structure: Page Structure – Defining Procedures – Page – Compiler Directives - Sample Page. HTML Server Controls: HTMLAnchor Control – HTMLTable, HTMLRow, and HTMLTableCell Controls – HTMLForm and Form Input Controls – HTMLInputFile Control.

UNIT II

15 Hrs.

Basic Web Server Controls – Data List Web Server Controls.

UNIT III

15 Hrs.

Other Web Server Controls: Calender Control – AdRotator Control – Validation Controls. Request and Response Objects.

UNIT IV

20 Hrs.

System.Data and System.Data.OleDb Namespace: OleDbConnection Class – OleDbCommand Class – OleDbTransaction Class – OleDbDataAdapter Class – DataSet Class. System.Data.SqlClient Namespace: Connection – Manipulating data – Retrieving Data from a SQL Server Database.

UNIT V

20 Hrs.

Working with IIS and Page Directives: WWW Service Properties – Web Sites within IIS – Adding a Web Site – Web Site Properties – ASP.NET Applications.

Error Handling: No Error Handling – Resume Next – On Error Goto Handler – Resume from Handler – Try/Catch Code Block – Err Object.

RECOMMENDED TEXTBOOKS:

1. Greg Buczek , “ASP.NET Developer’s Guide”, TMH Edition, 2002.
2. Jesse Liberty & Dan Hurwitz, “Programming ASP.NET”, O’Reilly Second Edition, 2005.

REFERENCE BOOKS:

1. Anne Boehm, “ASP.NET 4 Web Programming with VB 2010”, SPD Publishers, Fourth Edition.
2. Michael W. Berry, Survey of Text Mining – Clustering, Classification and Retrieval, Springer International Edition.
3. Matthew Macdonald, ASP.NET: The Complete Reference, McGraw Hill Education, 2017.
4. Freeman, Adam, Pro ASP.NET MVC 5, Apress, 2013
5. [Bill Evjen](#), [Matt Gibbs](#), [Dan Wahlin](#), [Dave Reed](#), Professional ASP.NET 3.5 AJAX, Wrox, 1st Edition.

JOURNALS:

1. Science of Computer Programming
2. Journal of Programming Languages

E-LEARNING RESOURCES:

- 1.<https://lecturenotes.in/materials/17216-note-of-asp-net-notes-in-pdf-by-tutorialpoints-by-suraj-sinha>
- 2.<https://www.slideshare.net/julieiskander1/aspnet-lecture-1>
- 3.<https://www.javatpoint.com/asp-net-tutorial>
- 4.https://www.youtube.com/watch?v=3AYoipyqOkQ&list=PL6n9fhu94yhXQS_p1i-HLIftB9Y7Vnxlo
- 5.<https://www.guru99.com/asp-net-tracing-debugging-error-handling.html>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Study the basic page structure of ASP.NET.
CO 2	Apply technical knowledge and perform specific technical skills, includes: Design, Debug and Deploy web applications using ASP.NET
CO 3	Use ASP.NET controls in web applications.
CO 4	Create database driven ASP.NET web applications and web services.
CO 5	Implement ASP.NET web applications.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	3	3	3	3
AVERAGE	3	2.2	2.2	2.6	2.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving Seminar

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7x5 marks	200	25		Atleast one question from each unit

K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER III

ASP.NET PROGRAMMING – LAB

TOTAL HOURS: 90 hrs

COURSE CODE: 176717

CREDITS: 3

L-T-P: 0-0-3

COURSE OBJECTIVES:

6. Programming environment for ASP.net programs.
7. Creating ASP.Net applications using standard .net controls.
8. Develop a data driven web application.
9. Connecting to data sources and managing them. Maintain session and controls related information for user used in multi-user web applications
10. Understand the fundamentals of developing modular application by using object oriented methodologies.

COURSE OUTLINE

LIST OF PRACTICALS TO BE IMPLEMENTED

90 hrs

1. Creating Sample Page Structure using ASP.NET
2. Sample Page defined with Procedures
3. Working with HTMLAnchor Control
4. Working with HTMLTable Controls
5. Working with HTMLForm controls
6. Working with basic Web Server Controls
7. Working with CheckBoxList Control
8. Working with RadioButtonList Control
9. Working with DropDownList, ListBox Control
10. Working with DataGrid, Repeater Control
11. Working with Calender Control
12. Working with Validation Control
13. Working with Request and Response Object

14. Working with Cookies
15. Working with Error Handling

RECOMMENDED TEXTBOOKS:

1. Matthew MacDonald, "As.Net",-The Complete Reference 1st Edition
2. Ramesh Bangia," Unix Concepts and Applications"- Learning ASP.Net and C#.Net Paperback – 2012

REFERENCE BOOKS:

1. Professional Asp.Net MVC 5 –Asp.Net – Jon Galloway.
2. ASP.Net Programmer's Reference (English, Paperback, Caison Charles Crawford Jr.),"Asp.Net" – Caison Charles Crawford Jr
3. WILEY INDIA PVT. LTD, Beginning Asp.Net in C#" – Macdonald M
4. Wiley India Pvt Ltd," Asp.Net 4 in C# 2010"- Matthew Macdonald,Adam Freeman.
5. Wiley India Pvt Ltd,"Dot Net 3.5 Programming"-Kogent Learning Solutions Inc.

JOURNALS:

1. Research and application of web development based on ASP.NET 2.0+Ajax
2. Security point of view of Asp.Net application

E-LEARNING RESOURCES:

1. https://www.onlinebuff.com/article_step-by-step-to-use-stored-procedures-in-aspnet-c-with-example_49.html
2. <https://www.c-sharpcorner.com/UploadFile/e83792/asp-net-server-controls/>
3. <https://www.guru99.com/asp-net-controls.html>
4. <https://www.c-sharpcorner.com/UploadFile/ca2535/Asp-Net-repeater-control-using-C-Sharp/>
5. <https://www.c-sharpcorner.com/uploadfile/annathurai/cookies-in-Asp-Net/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Apply basic program in Asp.Net
CO 2	Apply and Design Checkbox and Radio button control
CO 3	Handle to use different Validation Control
CO 4	Apply and Develop a process with Cookies.
CO 5	Apply Error Handling method in asp.net.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Using Computer in Lab

SEMESTER III BIG DATA ANALYSIS

TOTAL HOURS: 90 Hrs.

COURSE CODE: 176718

CREDITS: 3

L-T-P

: 3-0-0

COURSE OBJECTIVES:

To enable the post graduate students

- 1 To explore the fundamentals of big data analytics, Intelligent analysis and various tools for analysis and reporting.
- 2 To learn to analyze various big data streams and how to process the different types of streams.
- 3 To understand Hadoop platform and MapReduce and able to explore how to implement them.
- 4 To learn to use the Hadoop clusters and how Hadoop is implemented in the cloud.
- 5 To understand the applications of Pig and Hive , the database for Hadoop Hbase and the various analysis and interaction techniques

COURSE OUTLINE:

UNIT I

20 Hrs.

Introduction to Big Data Platform – Challenges of Conventional Systems – Intelligent data analysis – Nature of Data – Analytic Processes and Tools – Analysis VS Reporting – Modern Data Analytic Tools – Statistical Concepts: Sampling Distributions – Re – Sampling – Statistical Inference – Prediction Error.

UNIT II

15 Hrs.

Introduction To Streams Concepts – Stream Data Model and Architecture – Stream Computing – Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window – Real time Analysis Platform(RTAP) Applications

UNIT III

15 Hrs.

History of Hadoop – The Hadoop Distributed File System – Components of Hadoop – Analyzing the Data with Hadoop – Scaling Out – Hadoop Streaming – Design of HDFS – Java interfaces to HDFS- Basics – Developing a Map Reduce Application – How Map Reduce Works – Anatomy of a Map Reduce Job run – Failures – Job Scheduling – Shuffle and Sort – Task execution – Map Reduce Types and Formats – Map Reduce Features.

UNIT IV

20 Hrs.

Setting up a Hadoop Cluster – Cluster specification – Cluster Setup and Installation – Hadoop Configuration – Security in Hadoop – Administering Hadoop – HDFS – Monitoring – Maintenance – Hadoop benchmarks – Hadoop in the Cloud.

UNIT V

20 Hrs.

Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive – fundamentals of HBase and Zookeeper Visualizations – Visual data analysis techniques, interaction techniques: Systems and applications.

RECOMMENDED TEXTBOOKS:

- 1 Michael Berthold, David J. Hand, “Intelligent Data Analysis”, Springer, 2007.
- 2 Tom White “Hadoop: The Definitive Guide” Third Edition, O’Reilly Media, 2012.

REFERENCE BOOKS:

- 1 Nathan Marz, James Warren “Big Data: Principles and best practices of scalable real-time data systems” 1st Edition, Manning Publications, 2015.
- 2 Martin Klepmann, “Designing Data-Intensive Applications: The Big Ideas Behind Reliable, Scalable, and Maintainable Systems” , First Edition, O’Reilly , 2015
- 3 Big Data For Dummies; 1st edition (April 15, 2013)
- 4 Seema Acharya, SubhashiniChellappan , “Big Data and Analytics”, Wiley publications, 2015
- 5 MayankBhushan, “Big Data and Hadoop- Learn by Example”, BPB publications 2018

JOURNALS:

- 1 <https://journalofbigdata.springeropen.com/>
- 2 <https://www.journals.elsevier.com/big-data-research>
- 3 <https://link.springer.com/journal/40537>
- 4 <https://link.springer.com/journal/40537>
- 5 <https://www.scimagojr.com/journalsearch.php?q=21100791292&tip=sid&clean=0>

E-LEARNING RESOURCES:

- 1 <https://nptel.ac.in/courses/106104189/>
- 2 <https://www.coursera.org/mastertrack/big-data-asu>
- 3 <https://www.cloudera.com/products/open-source/apache-hadoop.html>
- 4 <https://hadoop.apache.org/docs/stable/>
- 5 <https://www.ibm.com › analytics › hadoop › big-data-analytics>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Demonstrate the challenge with Big Data and various modern Analytics Tools
CO 2	Interpret Big Data as stream, how to filter & analyze the stream
CO 3	Understand the Hadoop Architecture, how to run jobs, tasks
CO 4	How to develop map reduce applications.
CO 5	Experiment with Hadoop Architecture, its Applications

MAPPING-CO with PSO

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	3	1	2	1
CO2	3	2	3	2	1
CO3	2	2	3	3	3
CO4	3	2	3	3	3
CO5	2	3	2	2	3
AVERAGE	2.4	2.4	2.4	2.4	2.2

Key: Strongly Correlated-3, Moderately Correlated-2, Weakly Correlated-1, No Correlation-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving

Seminar

QUESTION PAPER PATTERN-PG

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any

K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7 X 5 marks	200	25		At least one question from each unit
K2, K 3	C-3/5 X 10 marks	500	30		Compulsory One question from each unit

SEMESTER III
C# AND .NET TECHNOLOGY

TOTAL HOURS: 90 hrs

COURSE CODE: 176719

CREDITS : 3

L-T-P:3-0-0

COURSE OBJECTIVES:

1. To understand basic concepts of C# AND .NET technology.
- 2.To understand the concepts of objects oriented programming in C#
- 3.To learn the basics of Data binding and validations
- 4.To learn on web programming
- 5.To learn server binding and interfacing.

COURSE OUTLINE:

UNIT I

20hrs

Introduction to c#-Understanding.NET -overview of C#-literals-variables-data types-operations-expression-branching-looping-methods-arrays-string-structures-enumeration.

UNIT II

15hrs

Classes– Objects-Inheritance –Polymorphism –Interfaces-Operator Overloading-Delegates-Events and exceptions.

UNIT III

15hrs

Building Windows Application- accessing data with ADO.net- Data Binding – Input Validation.

UNIT IV

20hrs

Programming web application with Web forms - Programming web services.

UNIT V

20hrs

Assemblies-versioning-attributes-reflection-viewing Meta data-type discovery-reflection on a type-marshalling-remoting-understanding server objects types –specifying a server with an interface - building a server-building client-using single call-thread.

RECOMMENDED TEXT BOOKS

1. E.Balagurusamy, “Programming in C#”, Tata McGraw Hill, 2004.
2. J.Liberty, “Programming in C#”, 2nd Edition, O’Reilly, 2002.
3. Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson, Morgan Skinner, “Professional C# .NET 4.5”, Oreilly publications, First edition, 2012.

REFERENCE BOOKS

1. Herbert Schildt, ”The complete reference of C#”, Tata McGraw Hill, 2010.
2. Robinson et al, ”Professional C#”, 3rd Edition, Wrox Press, 2004.
3. Andrew Troelsen, ”C# and the .NET platform”, 7th edition, A! Press, 2015.
4. S.Thamaraiselvi, R.Murugesan, ”A Text Book On C#”, Pearson Education, 2012.
5. Ian Griffiths, “Programming C# 5.0 “, BPB Publications, 2012.

JOURNALS:

1. <https://journals.sagepub.com>

2. <https://www.planet-source-code.com>

E-LEARNING RESOURCES:

1. <https://www.tutorialspoint.com/vb.net/index.htm>
2. <https://www.guru99.com/vb-net-tutorial.html>
3. <https://www.udemy.com/learning-visual-basic-net/>

4. <https://www.homeandlearn.co.uk/csharp/csharp.html>
5. <https://www.geeksforgeeks.org/introduction-to-net-framework/>

CO No.	CO Statements
CO 1	Gain knowledge about the features of C#
CO 2	Explain how C# provides support for OOPS concepts and event handling.
CO 3	Develop the web based applications using ADO.NET in C#
CO 4	Apply XML in the .NET environment to create Web Service-based applications
CO 5	Summarize the basics of Asynchronous programming

MAPPING-CO with PSO

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	3
CO2	2	3	2	3	2
CO3	2	2	3	3	3
CO4	2	2	3	3	3
CO5	3	3	3	3	3
AVERAGE	2.4	2.6	2.6	2.8	2.8

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture by chalk and talk, Assignment, Peer Learning and Seminar.

SEMESTER IV

INFORMATION SECURITY

TOTAL HOURS: 90 hrs

COURSE CODE: 176721

CREDITS: 3

L-T-P: 3-0-0

COURSE OBJECTIVES:

- This course is designed to understand the importance of Information Security in our increasingly computer-driven world.
- Analyzing the Key concepts of information security and how they
- “work”
- Applying the security classifications and categorizing the critical situations
- Develop a network usage from a security perspective, identifying the salient issues, view points and trade - offs.
- Working with the current risks and interact collaboratively in groups to examine, understand and explain key aspects of information security.

COURSE OUTLINE

Unit I

Introduction - elements of Information Protection – Common Threats – Policies and Procedures – Risk Management - Typical Information Protection Program – Threats to Information Security - Business Unit Responsibilities – Information Security Awareness Program – Information Security Program Infrastructure. (20 Hours)

Unit II

Information Security Policies – Corporate Policies – Organization Policy Document – Legal Requirements – Business Requirements - Definitions – Policy key element – Policy Format. (15 Hours)

Unit III

Asset Classification – Introduction – Why classify Information? – Information classification category examples – What constitutes confidential Information? – Employee Responsibilities – Classification Examples – Access control. (15 Hours)

Unit IV

Physical Security – Data centre Requirements – Physical Access Controls – Fire Prevention and detection – Verified disposal of documents – Agreements – Intrusion Detection Systems

(15 Hours)

Unit V

Risk Analysis and Risk Management – Frequently Asked Questions on Risk Analysis – Information Security Life Cycle – Risk Analysis Process – Risk Mitigation – Control Categories – Business Continuity Planning – Business Continuity Planning Policy – Conducting a Business Impact Analysis (BIA) – Preventive Controls – Recovery Strategies – Plan Construction – Plan Testing – Plan Maintenance.

(25 Hours)

RECOMMENDED TEXTBOOKS:

1. Thomas R. Peltier, Justin Peltier, John Blackley , “Information Security Fundamentals”, AUERBACH Publications,2010.
2. I.A. Dhotre, Y.S. Bagad, “Information Security”, Technical Publications, 2009.

REFERENCE BOOKS:

1. Mark Rhodes – Ousley , “Information Security: The Complete Reference”, 2nd Edition,2013
2. Charles P. Pfleeger, “ InfoSec Pros Must – Have Books, Security in Computing”, 5th Edition
3. Lee Brotherston, “Defensive Security Handbook”, Best Practices for Security Infrastructure.
4. “Instant OSSEC Host-Based Intrusion Detection System” by Brad Lhotsky, [PACKT] Publications
5. Raymond Pompon, “IT Security Risk Control Management: An Audit Preparation Plan (1st Edition)

JOURNALS:

1. ISJ: International Security Journal
2. Journal of Information Security

E-LEARNING RESOURCES:

- 1.<http://resources.infosecinstitute.com/fifteen-must-have-books-for-penetration-testing-professionals/>
- 2.<https://resources.infosecinstitute.com/key-elements-information-security-policy/>

3.<https://www.techopedia.com/definition/3988/intrusion-detection-system-ids>

4.<https://heimdalsecurity.com/blog/best-cyber-security-books>

5.<https://searchsecurity.techtarget.com/definition/security-policy>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understanding the concept of Information Security
CO 2	Analyzing and key factors using various policies
CO 3	Evaluating the classifications and categorizing with examples
CO 4	Developing the network usage using prevention measures
CO 5	Working with the current risk factors and interpreting the recovering strategies

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-LCD)

QUESTION PAPER PATTERN-UG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER IV

COMPUTER NETWORKS AND SECURITY

TOTAL HOURS:90 hrs

COURSE CODE: 176722

CREDITS :3

L-T-P: 3-0-0

COURSE OBJECTIVES:

To enable the post graduate students

1. To develop knowledge over the basics of Networks ,PhysicallayerandData link layer.
- 2.To recognize the functionality of various protocols in Network layer.
3. To analyze the steps involved in algorithms belong to the Transport layer.
4. To know the significance of services offered by Application Layer.
5. To understand the security and threats in using real time end-user applications.

COURSE OUTLINE:

UNIT I

20 Hrs.

Introduction: Network hardware – Types of networks – OSI Reference Model. Physical Layer: Guided transmission Media – Magnetic media – Twisted pair – Coaxial Cable – Fibre Optics. Wireless Transmission – Electromagnetic Spectrum – Radio Transmission – Microwave transmission – Switching. Data Link Layer : Design Issues – services – Framing – error Control – flow Control – Error detection and Correction.

UNIT II

20 Hrs.

Network Layer: Store and Forward Packet Switching – Services to Transport layer – Implementation of Connection-Oriented Service – Comparison of Virtual Circuit and Datagram subnets. Routing Algorithms: The Optimality Principle – Shortest Path – Flooding – Distance Vector – Linked-state – Hierarchical – Broadcast – Multicast Routing. Congestion Control Algorithms : Principles – Prevention Policies.

UNIT III

20 Hrs.

Transport Layer: Transport Service – Service to Upper layers – Primitives – Protocols – Elements of Transport Protocol – Addressing – Connection Establishment – Release – Internet Transport Protocol – TCP – Introduction – Service Model – Protocol – TCP Segment header.

UNIT IV

20 Hrs.

Application Layer : DNS – Name Space – Resource Records – Name Server – Electronic Mail – Architecture and Services – User Agent – Message Format – Message Transfer – Final Delivery – www: Architectural Overview – Static Web Document.

UNIT V

10 Hrs.

Network Security: Cryptography – Introduction -Substitutional Ciphers – Transpositional Cipher – Digital Signatures – Symmetric Key Signature – Firewalls – Email Security:PGP – PEM. Web Security: Threats – Secure Naming – SSL.

RECOMMENDED TEXTBOOKS:

1. Andrew S. Tanenbaum and David J. Wetherall, “Computer Networks”, Fifth Edition, Pearson Education 2012.(Unit I to IV)
2. William Stallings, Network security essentials , Pearson Education fifth Edition 2011.(Unit V).

REFERENCE BOOKS:

1. William Stallings, Data and Computer Communications, Sixth Edition, PHI, 2013.
2. Behrouz A. Forouzan and Firouz Mosharraf, "Data Communications and Networking", McGraw Hill, Special Indian Edition 2012.
3. Bruce S. Davie & Larry L. Peterson, Computer Networks - A System Approach, Elsevier; Fifth edition (2011)
4. [James F., Kurose](#) [Keith W., Ross](#), Computer Networking: A Top-Down Approach, Pearson India Education Private Limited, 2017.
5. [Rathi Narayan](#), Computer Networks Paperback, Eswar Press 2010

JOURNALS:

1. <https://www.springer.com/gp/all-titles-in-computer-networks/9850852>
2. <http://www.sciepub.com/journal/JCN>

E-LEARNING RESOURCES:

1. <http://iips.icci.edu.iq/images/exam/Computer-Networks---A-Tanenbaum---5th-edition.pdf>
2. <https://www.oreilly.com/library/view/computer-networks-fifth/9780133485936/>
3. http://elearning.ascollegelive.net/studyMaterial/bca/bca_3rd_year/Networking%20Notes.pdf
4. http://www.vssut.ac.in/lecture_notes/lecture1428550521.pdf
5. http://164.100.133.129:81/econtent/Uploads/Computer_Networks_Data_Communication.pdf

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Extend adequate study over the basics of Network Hardware, Software and entities present in Physical layer and Data link layer.

CO 2	Understanding the functionality of various algorithms associated with routing and handling congestion in the Network Layer.
CO 3	Learning the elements of Transport layer Protocol and the function of TCP protocols .
CO 4	Learn the technical implementations wrapped-up in the services offered by Application layer.
CO 5	Understanding the security and threats in real time and the methods available for protection.

MAPPING-CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	2	2	2
CO 2	3	2	2	2	2
CO 3	3	2	2	3	2
CO 4	3	2	2	2	2
CO 5	2	2	2	3	3
Average	2.8	2	2	2.8	2.2

Key: Strongly Correlated-3, Moderately Correlated-2, Weakly Correlated-1, No Correlation-0

TEACHING METHODOLOGY:

Lecture by chalk and talk

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER IV

DATA WAREHOUSING AND DATA MINING

TOTAL HOURS: 90 hrs

COURSE CODE: 176723

CREDITS : 3

L-T-P : 3-0-0

COURSE OBJECTIVES:

- 1 To understand the definition of data mining, its architecture, technologies used , various types of data and about data visualization

- 2 To know about various preprocessing techniques, online analytical processing, data warehouse architecture and multidimensional data models
- 3 To explore the fundamentals of data cube technology, multidimensional data analysis, frequent item set mining and various evaluation methods
- 4 To analyze various classification methods like decision tree induction, bayes, rule based classification etc.,
- 5 To know about various cluster analysis methods, outlier detection and recent research trends in data mining

COURSE OUTLINE:

UNIT I

20 Hrs.

Introduction: Motivation for Data Mining - Data Mining. Data Mining in various kinds of data: Relational databases – Data Warehouses – Transactional databases – Advanced Data and Information System and Advanced Applications – Data Mining Functionalities – Classification of data mining – Data Mining Task Primitives - Mining Issues.

UNIT II

15 Hrs.

Data Preprocessing: Why preprocess the data – Data cleaning – Data Integration and Data Transformation – Data Reduction – Data Discretization and Concept hierarchy generation for Numerical data.

UNIT III

20 Hrs.

Data Warehouse and OLAP Technology: Data Warehouse – Tables and Spreadsheet to Data cubes – Stars, Snowflakes and Fact Constellations - Schemas for Multidimensional Database – Steps for Design and Construction of data Warehouses- Three Tier Data Warehouse Architecture – Data Warehouse Back-End Tools and Utilities- Metadata Repository- Data Warehousing to Data Mining.

UNIT IV

15 Hrs.

Mining Frequent Patterns, Association and Correlation: Basic Concepts- Efficient and Scalable frequent itemset methods – The Apriori Algorithm- Generating Association rules from frequent itemsets- Improving efficiency of Apriori –Mining frequent itemsets without candidate Generation–Mining Multilevel Association Rules -Constraint Based Association Mining.

UNIT V

20 Hrs.

Classification and Prediction: What is Classification – What is Prediction- Issues regarding Classification and Prediction – Bayesian Classification – Other Classification Methods – Prediction - Cluster Analysis – Categorization of Major Clustering Methods - Social implications of Data mining – Trends in Data Mining.

RECOMMENDED TEXTBOOKS:

1. J. Han and M. Kamber, "Data Mining: Concepts and Techniques, Morgan Kaufmann, Second Edition, 2010.
2. PaulrajPonnaiah, " Data Warehousing Fundamentals", Wiley Publishers, 2001.

REFERENCE BOOKS:

1. Charu C. Aggarwal, "Data Mining: The Textbook" , Springer 2015 Edition
2. Da Ruan, "Intelligent Data Mining: Techniques and Applications " Springer 2007
3. Mohammed J. Zaki, Wagner Meira, Jr, Wagner Meira, "Data Mining and Analysis: Fundamental Concepts and Algorithms", Cambridge University Press
4. Ian H. Witten, Eibe Frank, Mark A. Hall, Christopher J. Pal , "Data Mining: Practical Machine Learning Tools and Techniques", Morgan Kaufmann, Fourth Edition 2017
5. Arun K. Pujari, "Data Mining Techniques", Universities Press, 2005

JOURNALS:

- 1 Data Mining and Knowledge Discovery
- 2 The International Journal of Biomedical Data Mining (JBDM)
- 3 American Journal of Data Mining and Knowledge Discovery

E-LEARNING RESOURCES:

- 1 <https://www.classcentral.com/course/coursera-pattern-discovery-in-data-mining-2733>
- 2 <https://www.classcentral.com/subject/data-mining>
- 3 <https://web.ccsu.edu/datamining/resources.html?redirected>
- 4 <http://whitepapers.virtualprivatelibrary.net/Data%20Mining%20Resources.pdf>
- 5 <https://www.guru99.com/data-mining-tutorial.html>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO1	Understand the definition of data mining, its architecture, technologies used , various types of data and about data visualization
CO2	Know about various preprocessing techniques, online analytical processing, data warehouse architecture and multidimensional data models

CO3	Explore the fundamentals of data cube technology, multidimensional data analysis, frequent item set mining and various evaluation methods
CO4	Analyze various classification methods like decision tree induction, bayes, rule based classification etc.,
CO5	Know about various cluster analysis methods, outlier detection and recent research trends in data mining

MAPPING : COURSE OUTCOME WITH PROGRAM SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	3	2	3	2
CO2	2	3	3	2	1	3
CO3	3	2	3	2	2	2
CO4	2	3	3	2	3	2
CO5	2	3	3	2	3	2
AVERAGE	2.2	2.8	3	2	2.4	2.2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1 NO CORELATION-0

TEACHING METHODOLOGY:

- Lecture (Chalk and Talk)
- Quiz
- Peer Learning

QUESTION PAPER PATTERN :

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER IV

WEB PROGRAMMING AND JAVA

TOTAL HOURS: 90 Hrs.
CREDITS: 3

COURSE CODE:176720
L-T-P: 3-0-0

COURSE OBJECTIVES:

- Able to design and implement Internet systems for enhancing practical knowledge.
- Able to understand functionality of Internet system.
- Able to design a system according to customer needs using the available Internet technologies.
- Able to Design and develop interactive, client-side, server-side executable web applications.

COURSE OUTLINE :

UNIT I

JavaScript - Data Types – forms – Mouse events – Keyboard events - String manipulation – form validation – Random loading of pages - Java features – Data types – Expressions – Conditional and iteration executions – References – Arrays – Garbage Collection - Run time environment .

UNIT II

Classes – Variables - Methods – Constructors – Access specifies – Inheritance – Interface Packages – Strings –String buffer - Exceptions and Errors – Exception classes – Run time Exception – Finally Block – User Defined Exception .

UNIT III

Creating Threads – Controlling Threads – Multithreading – Thread Properties – Thread Synchronization - Utility Packages – Language Packages- Java I/O.

UNIT IV

Applets - AWT package – Layouts – Containers – Event Package – Event Model – Painting – Garbage Collection Dialog box – Menus –Graphics context – Introduction to Swings.

UNIT V

Remote Method invocation - Servlets – Deployment of Simple Servlets – Web server –HTTP GET and POST requests – Session tracking - Tracking – Cookies - JDBC – Simple web Applications – Multi-tier Applications.

RECOMMENDED TEXTBOOKS:

1. P. Naughton, H.Schildt, “Java 2: The Complete Reference”, TMGH, 3rd Edition, 1999.
2. R. Krishnamoorthy, S.Prabhu, “Internet and Java Programming”, New Age International Publishers, 2004.
3. Thomson A Powell, “The Complete Reference HTML and XHTML”, Tata McGraw Hill, 4th Edition, 2003.

REFERENCE BOOKS

1. Joseph. L. Weber, “Using Java 2-EEE “, Prentice Hall of India , 2000.
2. Patrick Henry Winston, SundarNarsimbhan, “Onto Java “, Addison Wesley, 2001.
3. Daniel Groner, K. C. Hoipson, “Java Language API Super Bible”, Waite Grocey Press, 1996.

COURSE OUTCOMES:

CO	PSO 1
CO1	Able to design and implement Internet systems for enhancing practical knowledge
CO2	able to understand functionality of Internet system.
CO3	Able to design a system according to customer needs using the available Internet technologies.
CO4	Able to Design and develop interactive, client-side, server-side executable web applications
CO5	Able to design multi tier architecture

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

QUESTION PAPER PATTERN :

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER IV

WEB PROGRAMMING AND JAVA – LAB

TOTAL HOURS: 90 Hrs.

CREDITS: 3

COURSE CODE:176720

L-T-P: 3-0-0

COURSE OBJECTIVES:

- **Able to design and implement Internet systems for enhancing practical knowledge.**
- **Able to understand functionality of Internet system.**
- **Able to design a system according to customer needs using the available Internet technologies.**
- **Able to Design and develop interactive, client-side, server-side executable web applications.**

COURSE OUTLINE :

Java Script

1. Simple scripting
2. Working with forms
3. Implementing with mouse and keyboard event
4. Working with Strings
5. Working with form Validation
6. Random loading page

Java

1. Implementing interface
2. Creating a package
3. Working with Multiple Exception
4. Working with User Defined Exception
5. Implementation of Thread
6. Working with Thread Synchronization
7. Simple Applet program
8. Processing with the Mouse event
9. Implementing menu in frame
10. Simple Calculator program
11. Working with RMI
12. Implementing with JDBC
13. Simple chatting using Socket programming
14. Implementing Servlet

RECOMMENDED TEXTBOOKS:

1. P. Naughton, H.Schildt, “Java 2: The Complete Reference”, TMGH, 3rd Edition, 1999.
2. R. Krishnamoorthy, S.Prabhu, “Internet and Java Programming”, New Age International Publishers, 2004.
3. Thomson A Powell, “The Complete Reference HTML and XHTML”, Tata McGraw Hill, 4th Edition, 2003.

REFERENCE BOOKS

1. Joseph. L. Weber, “Using Java 2-EEE “, Prentice Hall of India , 2000.
2. Patrick Henry Winston, SundarNarsimbhan, “Onto Java “, Addison Wesley, 2001.
3. Daniel Groner, K. C. Hoipson, “Java Language API Super Bible”, Waite Grocey Press, 1996.

COURSE OUTCOMES:

CO	PSO 1
CO1	Able to design and implement Internet systems for enhancing practical knowledge
CO2	ble to understand functionality of Internet system.
CO3	Able to design a system according to customer needs using the available Internet technologies.

CO4	Able to Design and develop interactive, client-side, server-side executable web applications
CO5	Able to design multi tier architecture

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORRELATION-TEACHING METHODOLOGY:

Lecture - Chalk and Talk

SEMESTER IV

PROFESSIONAL ETHICS

TOTAL HOURS: 90 Hrs.

COURSE CODE:176725 CREDITS: 3
L-T-P: 3-0-0

COURSE OBJECTIVES:

16. To create awareness on professional ethics and ethical dilemma.
17. To create an awareness on computer crime, Patents, trademarks, trade secrets and copyright.
18. To provide basic familiarity about the censorship, risk benefit analysis and the method of reducing risk.
19. To inculcate knowledge of overcoming an obstacle for individuals, empowering computers in the workplace.
20. To develop a strategy social networking and online fraud

COURSE OUTLINE

UNIT I

15 Hrs.

A general Introduction – Computer ethics: an overview – Identifying an ethical issue – Ethics and law – Ethical theories - Professional Code of conduct – An ethical dilemma – A framework for ethical decision making - Computer hacking – Introduction – definition of hacking – Destructive programs – hacker ethics - Professional constraints – BCS code of conduct – To hack or not to hack? – Ethical positions on hacking

UNIT II

20 Hrs.

Aspects of computer crime - Introduction - What is computer crime – computer security measures – Professional duties and obligations - Intellectual Property Rights – The nature of Intellectual property – Intellectual Property – Patents, Trademarks, Trade Secrets, Software Issues, Copyright - The extent and nature of software piracy – Ethical and professional issues – free software and open source code

UNIT III

15 Hrs.

Introduction – In defence of freedom expression – censorship – laws upholding free speech – Free speech and the Internet - Ethical and professional issues - Internet technologies and privacy – Safety and risk – assessment of safety and risk – risk benefit analysis – reducing risk

UNIT IV

20 Hrs.

Introduction – Principle of equal access – Obstacles to access for individuals – professional responsibility - Empowering computers in the workplace – Introduction – computers and employment – computers and the quality of work – computerized monitoring in the work place – telecommuting – social, legal and professional issues - Use of Software, Computers and Internet-based Tools - Liability for Software errors - Documentation Authentication and Control – Software engineering code of ethics and practices – IEEE-CS – ACM Joint task force

UNIT V

20 Hrs.

Software Development – strategies for engineering quality standards – Quality management standards – Social Networking – Company owned social network web site – the use of social networks in the hiring process – Social Networking ethical issues – Cyber bullying – cyber stalking – Online virtual world – Crime in virtual world - digital rights management - Online defamation – Piracy – Fraud

CASE STUDY: Implementation of the methods/techniques used in the base paper selected.

RECOMMENDED TEXTBOOKS:

1. Penny Duquenoy, Simon Jones and Barry G Blundell, “Ethical , legal and professional issues in computing”, Middlesex University Press, 2008.

2. George Reynolds, “Ethics in Information Technology”, Cengage Learning, 2011.

REFERENCE BOOKS:

1. Caroline Whitback,” Ethics in Engineering Practice and Research “, Cambridge University Press, 2011.
2. P.Velmurugadass,” Professional ethics”, Thakur publications, 2014.
3. B.Chitra,” Professional ethics in engineering”, Charulatha Publications, 2012.
4. Karen Lebacqz, “Professional Ethics” Published by Power and Paradox
5. “A Textbook on Professional Ethics and Human Values” by R.S. Naagarazan. Published by New Age International, Second Edition

JOURNALS:

1. Aspects of Professional Ethics in the real world
2. Business and Professional Ethics Journal

E-LEARNING RESOURCES:

1. <https://www.emerald.com/insight/content/doi/10.1108/JICES-02-2017-0012/full/html>
2. <https://www.pdcnet.org/bpej/Business-and-Professional-Ethics-Journal>
3. https://cdn.ymaws.com/www.saimeche.org.za/resource/collection/BFA070FF-C69A-4A96-8106-47BBF81920CE/044-081-PDP-Outcome_8-Conduct_activities_ethically_MJRev0-04112013.pdf
4. <https://soaneemrana.org/onewebmedia/Professional%20Ethics%20and%20Human%20Values%20by%20R.S%20NAAGARAZAN.pdf>
5. <https://www.ditchthelabel.org/what-is-cyberbullying>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand the core values that shape the ethical behavior and exposed awareness on professional ethics and human values
CO 2	Analyze the basic perception of profession, professional ethics, various moral issues and ethical theories
CO 3	Understand various social issues, industrial standards, code of ethics
CO 4	Categorize various responsibilities of safety and risk analysis
CO 5	Apply ethical principles to resolve situations that arise in their professional lives

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

QUESTION PAPER PATTERN :

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER IV
CRYPTOGRAPHY

TOTAL HOURS: 90 hrs**COURSE CODE: 176726****CREDITS: 3****L-T-P: 3 0 0****COURSE OBJECTIVES:**

The PG students will be able to

- 1.To know theSecurity Concepts, model andSecurity Services.
2. To understand the concepts of conventional encryption andmethodsofpublic key encryption.
3. To learn Applications of Cryptographic Hash functionsandMessage Authentication Schemes.

4. To understand the network security considerations, layer and protocols to provide security.
5. To know the internet security at system level and understand security policies used.

COURSE OUTLINE:

UNIT I

10 Hrs.

Introduction: Computer Security Concepts-The OSI Security Architecture-Security Attacks-Security Services-Security Mechanisms-A Model for Network Security-Recommended Reading and Web Sites-Key Terms, Review Questions, and Problems-Introduction to cryptography.

UNIT II

20 Hrs.

Symmetric Ciphers: Symmetric Cipher model-Substitution Techniques-Transposition Techniques-Rotor Machines- Steganography – Block cipher Principles- The Data Encryption Standard (DES)-A DES Example- The Strength of DES – Asymmetric Ciphers: principles of public -key Cryptosystems-The RSA Algorithm.

UNIT III

20 Hrs.

Applications of Cryptographic Hash functions- -Two Simple Hash Functions-Requirements and Security- Message Authentication Requirements- Message Authentication Functions- Requirements for message Authentication Codes- Security of MACs- Digital signatures- ElGamal Digital Signature Scheme

UNIT IV

20 Hrs.

Network Security: -Web security considerations- Secure socket layer and Transport layer security- Transport layer security-HTTPS-Secure Shell (SSH)-Recommended Reading and Web Sites-Key Terms, Review Questions and Problems-IEEE 802.11 Wireless LAN Overview-IEEE 802.11i Wireless LAN Security-Wireless Application Protocol Overview-Wireless Transport Layer Security-WAP End-to-End Security.

UNIT V

20 Hrs.

Internet Security: Pretty Good Privacy-S/MIME-Domain keys identified Mail- Recommended Reading and Web Site-Key Terms, Review Question and Problems- IP Security Overview- IP Security Policy- Encapsulating Security Payload-Combining Security Associations- Internet Key Exchange-Cryptographic Suites.

RECOMMENDED TEXTBOOKS:

3. William Stallings, "Cryptography And Network Security – Principles and Practices", Pearson, Sixth Edition, 2015.
4. AtulKahate, "Cryptography and Network Security", Tata McGraw-Hill, 2013.

REFERENCE BOOKS:

6. Bruce Schneier, "Applied Cryptography", John Wiley & Sons Inc, 2011.
7. Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Third Edition, Pearson Education, 2013.
8. William Stallings, "Network Security Essentials: Applications and Standards", Pearson Publications, 4th Edition, 2011.
9. BehrouzForouzon, "Cryptography and Network Security", MC Graw- Hill Edition, 2010.
10. Prakash C. Gupta, Cryptography and Network Security, PHI Learning; 1 Edition (Nov2014)

JOURNALS:

3. <https://wireilla.com/ijcis/index.html>
4. <https://ieeexplore.ieee.org/document/4646371/>

E-LEARNING RESOURCES:

6. <https://freevidelectures.com/course/5027/cryptography-and-network-security>
7. <https://www.coursera.org/lecture/cryptography/public-key-encryption-40Sb3>
8. <https://www.coursera.org/learn/asymmetric-crypto>
9. <https://www.udacity.com/course/applied-cryptography--cs387>
10. <https://www.journals.elsevier.com/network-security>

COURS OUTCOMES:

CO No.	CO Statements
CO 1	Impart knowledge on Encryption techniques, Design Principles and Modes of Operation
CO 2	Design a security solution for a given application
CO 3	Devise the Key Management techniques
CO 4	Create an understanding of Authentication functions the manner in which Message Authentication Codes and Hash Functions works.
CO 5	Examine the issues and structure of Authentication Service and Electronic Mail Security

MAPPING-CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	3
CO 2	2	3	2	3	3
CO 3	2	2	2	3	3
CO 4	3	2	3	3	2
CO 5	3	3	3	3	3
Average	2.4	2.4	2.6	2.8	2.8

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture by chalk and talk.

SEMESTER V

SOFTWARE TESTING AND QUALITY ASSURANCE

TOTAL HOURS: 90 Hrs.

COURSE CODE: 176727

CREDITS: 3

L-T-P: 3-0-0

COURSE OBJECTIVES:

To enable the post graduate students

1. To explore the basics of various testing strategies.
2. To distinguish the essential need and necessity for testing strategies.
3. To investigate the strategies involved in variants of testing platforms.
4. To discern the significance of testing tools and their usage.
5. To comprehend the entities needed for Quality Management.

COURSE OUTLINE:

UNIT I

15 Hrs.

Principles of Testing: Context of testing in producing software – Software Development Life Cycle Models: Phases of Software Project – Quality, Quality Assurance, and Quality control – Testing, Verification and Validation – Life Cycle Models: Waterfall model – prototyping and Rapid application Development Models – Spiral and Iterative model – The V- Model – Modified V model.

UNIT II

15 Hrs.

Types of Testing: White Box Testing: What is White box testing? – Static Testing - Static Testing by Humans – Static Analysis Tools – Structural Testing: unit/Code Functional Testing – Code Coverage Testing – Code Complexity Testing – Black Box Testing: What is Black Box Testing? – Why Black box Testing – When to do black box testing – how to do Black box testing? – Requirements based testing – Positive and negative testing Boundary Value analysis – Decision Tables – Equivalence partitioning – State based or Graph Based Testing – Compatibility Testing – User Documentation Testing – Domain Testing.

UNIT III

10 Hrs.

Integration Testing: Integration Testing as a type of testing- Top-down Integration – Bottom –Up Integration – Bi-directional Integration – System Integration – Scenario Testing: System Scenarios – Use-case scenarios – Defect bash – System and Acceptance Testing: System Testing overview – Why is system testing done?- Functional Versus Non-Functional testing – Functional system testing – Non-functional Testing – Acceptance Testing - Performance Testing: Factors Governing performance testing – Methodology for Performance Testing – Tools for performance testing.

UNIT IV

25 Hrs.

Regression Testing: What is Regression Testing? – Types of Regression Testing – When to do Regression Testing? – How to do Regression Testing – Internationalization: Definition of terms Internationalization, Localization, Globalization – Test Phases for Internationalization Testing – Fake language Testing – Adhoc Testing: Overview of Adhoc testing – Buddy Testing – Pair testing – Exploratory Testing – Iterative Testing – Agile and Extreme Testing – Usability and accessibility Testing: What is usability Testing? – Quality factors for usability –Aesthetics testing – Accessibility Testing. Software Test Automation: What is Test Automation? – Selecting a Test Tool: Criteria for selecting Test tool – Challenges.

UNIT V

25 Hrs.

Introduction: What is software quality? - Software quality factors – The components of the Software quality assurance system – overview – Pre-project software quality components: Contract Review – Development and Quality plans – SQA components in the project life cycle: Integrating quality activities in the project life cycle – Reviews.

RECOMMENDED TEXTBOOKS:

1. Adithya P. Mathur, “ Foundations of Software Testing – Fundamentals algorithms and techniques”, Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008.
2. Boris Beizer, “ Software Testing Techniques” , Dream Tech Press, 2009.

REFERENCE BOOKS

1. Daniel Galin, “Software Quality Assurance from Theory to Implementation”, Pearson, First Edition, 2009.
2. Srinivasan Desikan, “Software Testing principles and Practices”, Gopalaswamy Ramesh, Pearson, First Edition, 2006.
3. Dale H. Besterfield , “Total Quality Management”, Pearson Education Asia, Third Edition, Indian Reprint (2011).
4. Aditya Mathur, “Foundations of software testing”, Pearson Education, 2008.
5. Ron Patton, “Software Testing”, Sams Publication, Pearson Education, Second Edition, 2007.

JOURNALS:

1. <https://onlinelibrary.wiley.com/journal/10991689>
2. <https://www.sciencedirect.com/science/article/pii/S1571066106000442>

E-LEARNING SOURCES

1. <http://www.guru99.com/software-testing.html>
2. <https://www.udemy.com/courses/development/software-testing>
3. <https://www.sciencedirect.com/topics/computer-science/software-quality-assurance>
4. <http://testingmasters.com/wp-content/uploads/ManualTestingMaterial.pdf>
5. <https://www.softwaretestinggenius.com/download/mtnarsir.pdf>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Study over the basics of testing strategies and its applications.
CO 2	Move on with the flow in which the testing strategies to be applied to the product is being developed.
CO 3	Learn the testing strategies to be adapted for different platforms.
CO 4	Evaluate the testing tools best suited for automating the testing process.

CO 5	Assess the performance levels for ensuring the Quality Management.

MAPPING-CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	2	3	2
CO 2	3	3	2	3	3
CO 3	3	2	2	3	3
CO 4	3	3	2	2	3
CO 5	2	2	3	3	2
Average	2.8	2.4	2.2	2.8	2.6

KEY: STRONGLY CORELATED-3, MODERATELY CORELATED-2, WEAKLY CORELATED-1, NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-LCD)

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER V

PRINCIPLES OF COMPILER DESIGN

TOTAL HOURS:90 hrs

COURSE CODE: 176728

CREDITS: 4

L-T-P : 4-0-0

COURSE OBJECTIVES:

The PG students will be able to:

1. To introduce the major concept areas of language translation and compiler design
2. To develop an awareness of the function and complexity of modern compilers

3. To understand the phases of the compilation process and be able to describe the purpose and implementation approach of each phase.
4. To give students practical exposure to aspects of theoretical Computer Science including Languages, Grammars, and Machines.
5. To exercise and reinforce prior programming knowledge with a non-trivial programming project to construct a compiler.

COURSE OUTLINE

UNIT I - LEXICAL ANALYSIS

15 hrs

Introduction to Compiling- Compilers-Analysis of the source program-The phases-Cousins-The grouping of phases-Compiler construction tools. The role of the lexical analyzer- Input buffering-Specification of tokens-Recognition of tokens-A language for specifying lexical analyzer.

UNIT II - SYNTAX ANALYSIS and RUN-TIME ENVIRONMENTS

25 hrs

Syntax Analysis- The role of the parser-Context-free grammars-Writing a grammar-Topdown parsing-Bottom-up Parsing-LR parsers-Constructing an SLR(1) parsing table. Type Checking- Type Systems-Specification of a simple type checker. Run-Time Environments-Source language issues-Storage organization-Storage – allocation strategies.

UNIT III- INTERMEDIATE CODE GENERATION

20 hrs

Intermediate languages-Declarations-Assignment statements - Boolean expressions - Case statements - Back patching - Procedure calls

UNIT IV - CODE GENERATION

15 hrs

Issues in the design of a code generator- The target machine-Run-time storage management-Basic blocks and flow graphs- Next-use information-A simple code generator-Register allocation and assignment-The dag representation of basic

blocks
Generating code from dags.

UNIT V - CODE OPTIMIZATION

15 hrs

Introduction-The principle sources of optimization-Peepphole optimization-
Optimization of
basic blocks-Loops in flow graphs- Introduction to global data-flow analysis-
Code
improving transformations.

RECOMMENDED TEXTBOOKS:

1. Alfred V. Aho, Ravi Sethi Jeffrey D. Ullman, “Compilers- Principles, Techniques, and Tools”, Pearson Education Asia, 2013.
2. Alfred V Aho, Monica S. Lam, Ravi Sethi, Jeffrey D Ullman , "Compilers Principles, Techniques and Tools", 2nd Edition, Pearson Education, 2011.

REFERENCES:

1. David Galles, “Modern Compiler Design”, Pearson Education Asia, 2014.
2. Steven S. Muchnick, “Advanced Compiler Design & Implementation”, Morgan Kaufmann Publishers, 2013.
3. C. N. Fisher and R. J. LeBlanc “Crafting a Compiler with C”, Pearson Education, 2012.
4. A.V. Aho, J.D.Ullman, Principles of Compiler Design, NarosaPub-House, 2013.
5. D.Gries, Compiler Construction for Digital Computers, John Wiley & Sons, 2009.

JOURNALS:

- 1.<http://www.serialspublications.com/journals/journal-detail.php?jid=66>
- 2.<https://link.springer.com/article/10.1007/s10766-005-35906>
- 3.http://www.academia.edu/Documents/in/Compiler_Design

E-LEARNING RESOURCES:

1. <https://nptel.ac.in/courses/106108052/>
2. <https://www.coursera.org/lecture/nand2tetris2/unit-4-2-lexical-analysis-QM0IZ>
3. <https://www.coursera.org/lecture/nand2tetris2/unit-4-1-syntax-analysis-5pC2Z>
4. <https://nptel.ac.in/courses/106104072/>
5. <https://nptel.ac.in/courses/106104072/>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Demonstrate a working understanding of the process of semantic analysis through the construction of semantic records based on parse trees
CO 2	The construction of symbol tables,
CO 3	The organization of run time memory and the writing of a semantic analyzer for a compiler.
CO 4	Design, analyze, implement and test a working compiler for a small language
CO 5	Develop a compiler with all the phases

MAPPING-CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	2	2	3
CO 2	3	3	2	3	3
CO 3	2	2	2	3	3
CO 4	3	2	3	3	2
CO 5	3	3	2	3	3
Average	2.8	2.4	2	2.8	2.8

KEY: STRONGLY CORELATED-3, MODERATELY CORELATED-2, WEAKLY CORELATED-1, NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk)

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER V**FINANCIAL TRENDS****TOTAL HOURS:90 hrs****COURSE CODE: 176729****CREDITS: 4****L-T-P : 4-0-0****COURSE OBJECTIVES:****COURSE OBJECTIVE:****UNIT I**

Development Of Accounting: Definition, Functions, Limitation Of Financial Accounting, Cost Accounting and Management Accounting, Distinction Between Financial and Management Accounting and Management Accounting And Cost Accounting.

UNIT II

Financial Statement Analysis: Meaning, Limitation, Nature, Functions, Important Of Financial Statements. Procedure For Analysis And Interpretation .Types Of Analysis, Techniques (Or) Tools Of

Financial Statement-Analysis And Limitations-Financial Planning-Mean, Scope, Object, Factors, Advantages, Limitations.

Unit III

Marginal – Introduction – Meaning , Silent Features Costing-Advantages, Limitations, Cost Volume Profit Analysis, Important Terms And Concepts In Cost – Volume Analysis, Fixed Cost, Variable Cost, Contributions ,Contribution To Sales(P/V Ratio),Break Even Analysis, BreakevenPoint, Break Event Chart, Margin of safety[SIMPLE PROBLEMS ONLY].

UNIT IV

Ratio Analysis –Interpretation, Benefits And Limitations, Classification And Ratio-Liquidity, Profitability, Turnover,(Simple Problems)

UNIT V

Budgets And Budgetary Control-Meaning, Objectives, Merits, Demerits-Types Of Budgets-Production, Cash And Flexible Budgets (Simple Problems)

BOOK FOR STUDY

1.S.Chand ,R.S.N.Pillai ,Bagavathi, ”Management Accounting “, Revised Edition ,

REFERENCE BOOKS

1. Dr. A.Murthy, “Financial management”, Margham publications,
- 2.Prof..T.S. Reddy, Dr.Y.Hariprasadh Reddy, “Management accounting”, Magham Publications

JOURNALS:

- 1.<https://www.sciencedirect.com/science/article/pii/S0361368201000113>

E-LEARNING RESOURCES:

1. <https://www.youtube.com/watch?v=vLv6CqCK1Sc>
2. <https://www.youtube.com/watch?v=vLv6CqCK1Sc>

TEACHING METHODOLOGY:

Lecture (Chalk and Talk)

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESER V

GUI PROGRAMMING

TOTAL HOURS: 90Hrs.

COURSE CODE: 176730

CREDITS:3

L-T-P: 3-0-0

COURSE OBJECTIVES:

1. Understand basics of PHP Language.
2. Learn how to design and program PHP applications.
3. Understand why Python is a useful scripting language for developers.
4. Learn how to design and program Python applications.
5. Learn how to use lists, tuples, and dictionaries in Python programs.

COURSE OUTLINE

UNIT I

15 Hrs.

PHP Language Basics: PHP & HTML – Getting Started – Basics of PHP: Datatypes – Variables – Constants – Operators – Arrays – Conditional Statements – Iterations.

UNIT II

20 Hrs.

Functions: User-Defined Functions – Built-in Functions – PHP Server Variables – Working with Date and Time – Performing Mathematical Operations – Working with String Functions – Working with Forms: The Main <FORM> tag – FORM Elements – Adding Elements to a FORM – Uploading Files to the Web Server using PHP.

UNIT III

20 Hrs.

Welcome to Python: What is Python? – Origins – Features – Downloading and Installing Python – Running Python – Python Documentation – Comparing Python. Getting Started: Program Output statement – Program Input function. Python Basics – Statements and syntax – Variable Assignment – Identifiers. Numbers: Introduction – Integers – Double Precision Floating Point Numbers – Complex Numbers – Operators – Built-in and Factory Functions.

UNIT IV

20 Hrs.

Sequences: Strings, Lists and Tuples – Sequences – Strings – Strings and Operators – StringOnly Operators – Built-in Functions – String Built-in Methods – Lists – Operators - Built-in Functions – List Type Built-in Methods – Tuples – Tuple Operators and Built-in Functions - Mapping and Set Types: Dictionaries – Mapping Type Operators – Mapping Type Built-in Functions and Built-in Methods – Dictionary Keys.

UNIT V

15 Hrs.

GUI Programming: Introduction – Tkinter and Python Programming – Tkinter Examples – Brief Tour of other GUIs – Related Modules and Other GUIs.

RECOMMENDED TEXTBOOKS:

- 1.IvanBayross, “Web Enabled Commercial Application Development using HTML, JavaScript, DHTML and PHP”, BPB Publications, 4th Revised Edition.
- 2.Wesley J. Chun, “Core Python Programming”, 2nd Edition, Pearson Education LPE, 2007.

REFERENCE BOOKS:

- 1.StevenHolzner, “PHP: The Complete Reference”, McGraw Hill Professional, 2008.
- 2.Mark Summerfield, “Programming in Python 3- A Complete Introduction to the Python Language”, 2nd Edition, Addison-Wesley Professional , 2010.
- 3.Allen Downey Chris Meyers Je_reyElkner, How to Think Like a Computer Scientist Learning with Python, Green Tea Press Wellesley, Massachusetts, 2015.
- 4.Peter Wentworth, Jeffrey Elkner, Allen B. Downey and Chris Meyers , How to Think Like a Computer Scientist: Learning with Python 3Documentation Release 3rd Edition, 2019.
- 5.NicholasH.Tollervey, Programming with MicroPython , Shroff/ O’Reilly, 2017.

JOURNALS:

- 1.International Journal of Advance Engineering and Research Development
- 2.International Research Journal of Engineering and Technology

E-LEARNING RESOURCES:

- 1.https://www.tutorialspoint.com/php/php_variable_types.htm
- 2.<https://www.slideshare.net/alexjones89/beginners-php-tutorial>
- 3.<https://www.coursera.org/learn/python?specialization=python>
- 4.<https://www.learnpython.org/>
- 5.<https://www.coursera.org/learn/python-network-data?specialization=python>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Learn basics of php. Understanding the basic php program.
CO 2	Learn to solve the new operations of php, understanding and implement the basic php problems.
CO 3	Learn to solve the new operations of python. understanding and implement the basic problems.
CO 4	Learn conditional and unconditional statements in python. Learn to solve function related problems.

CO 5	Understanding the Errors and Exceptions of python program. Gain knowledge about modules and packages.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	3	3
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	2	3	3
AVERAGE	3	2	2	3	3

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER V
MINI PROJECT

TOTAL HOURS :60 Hrs

COURSE CODE : 176731

CREDITS : 3

L-T-P : 0-0-3

Students have to develop a Mini Project in their area of interest using latest technology and tools.

SEMESTER V
BIO INFORMATICS

TOTAL HOURS:90hrs

COURSE CODE: 176732

CREDITS: 3

L-T-P: 3-0-0

COURSE OBJECTIVES:

11. To understand the concepts and functions of Bioinformatics.
12. To study the basic process of Gene and Genomics.
13. To study a detailed concepts of Gene Expression , DNA Transcriptions.
14. To study the online tools and software methods that are available to implement DNA, RNA or Protein Sequences.
15. To study the standard databases for Sequences in bioinformatics.

COURSE OUTLINE

UNIT I

20 hrs

Introduction –Definition Of Bioinformatics, Bioinformatics Database, Importance of Bio Informatics, Application Of Bio Informatics, Three Levels Of Bioinformatics In Structural Biology ,Components Of Bio Informatics, Bio Informatics As a Tool, Biological Databases Available In The Public Domain

.Commercial Uses Of Bioinformatics ,Role Of Bio And Chemo Informatics In Drugs Design, Bio Computing, Bio Informatics For Studying Bimolecular Structure , Role Of Bio-informaticians, Developing Bioinformatics computer skills

UNIT II

15 hrs

BIO-IT Industry Prospects, IT in BT, Scale of information Needs To Be Handled in Biotechnology, Software Tools, Bio-Computing, Fundamental of Bio Technology, Genes And Genomes, Human Genome Project (HGP), Amino Acid, Micro Array Technology, Genome Map, Gene Addition, Gene Subtraction, Gene map, Gene Therapy.

UNIT III

18 hrs

DNA: Definition, DNA Sequencing, Forms of DNA, And The Components of RNA, DNA Transcription, DNA Chip Technology, And MOTIF: Introduction, Phylogenetic Analysis Software, Motif Databases, Types of Motif Databases, Programs Used for Motif Analysis.

UNIT IV

17 hrs

Introduction –sequencing genes-analysis of raw sequence data-tasks of genome information systems-single color protocol protocol and four color protocol-study of genomics and its equivalent-proteomics-proteomics software-the folding problems-tools FOR ONLINE GENOME RESOURCES-PRINCIPLE BEHIND BIOCHEMICAL AND PHYSIOLOGICAL MODELING.

UNIT V

15 hrs

Biological Database: Introduction, Database Types, Sources On The Web For Some Important Data, Sequences Database-Protein Sequence Levels And Structural Organization. Biological Information On The Web Introduction –BLAST Algorithm, The Role Of NCBI, NCBI Databases, Genomic Resources, Genomic Tools.

RECOMMENDED TEXTBOOKS:

- 1.C.S.V.Murthy, “Bioinformatics”, Himalaya publishing House, PSC 075, <http://www.himpub.com>
2. Bioinformatics : Tools and Applications by David Edwards (Editor); Jason Eric StajichDavid Hansen (Editor) Published 2009-09-22

REFERENCE BOOKS:

1. Fundamental concepts of BioInformatics –Dan E.Krane Michael L.Raymer

2. Biotechnology and Bioinformatics: Advances and Applications for Bioenergy, Bioremediation and Biopharmaceutical Research 1st edition Devarajan Thangadurai PhD, Jeyabalan Sangeetha PhD
3. Gene Transcription – DNA BINDING PROTEINS K. Docherty
4. Introduction to Computational Proteomics 1st Edition Golan Yona
5. Bioinformatics Volume I: Data, Sequence Analysis, and Evolution Editors: Keith, Jonathan M. (Ed.)

JOURNALS:

5. Journal of Bioinformatics and Computational Biology
6. Journal of Molecular Endocrinology

E-LEARNING RESOURCES:

1. <https://www.phgfoundation.org> › documents role of bioinformatician
2. <https://www.conserve-energy-future.com/biotechnology-types-examples-applications.php>
3. <https://www.khanacademy.org> › ... › Transcription
4. www.biologydiscussion.com › biotechnology › proteomics-basic-concepts...
5. <https://bioinf.comav.upv.es> › courses › biotech3 › theory › databases

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand and apply the basic concepts of Bioinformatics of computer systems
CO 2	Apply and design the basic strategies of Genes and Genomics
CO 3	Design and develop to process the DNA Transcription , Motif Sequences to deliver the product of Gene Expression
CO 4	Develop the system in the various research areas in Bioinformatics using Online Tools.

CO 5	Acquaint to perform current problems in biological area using standard databases and thereby innovative a novel solutions to existing problems.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-LCD)

QUESTION PAPER PATTERN-UG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER V

DIGITAL IMAGE PROCESSING

TOTAL HOURS: 90 Hrs.

COURSE CODE: 176733

CREDITS: 3

L-T-P : 3-0-0

COURSE OBJECTIVES:

To enable the post graduate students

1. Understand the fundamentals of Digital image processing
2. Understand the different types of Image transform techniques.
3. Understand the different types of Image enhancement techniques in spatial and frequency domain.
4. Understand the different types of image degradation like linear image restoration techniques and nonlinear image restoration techniques
5. Understand the image compression like Lossy and Lossless image compression techniques and also understand the need of image segmentation.

COURSE OUTLINE:

UNIT I

20 Hrs.

Introduction – Steps in image processing – Components of an Image Processing System – Image representation, sampling and quantization – Relationship between pixels, - Mathematical Tools – Arithmetic – Set & Logic.

UNIT II

15 Hrs.

Image Enhancement in spatial domain – histogram processing, enhancement using arithmetic, logic operations, basis of spatial filtering and smoothing.

UNIT III

15 Hrs.

Image Restoration: model of degradation and restoration process – noise models – restoration in the presence of noise – periodic noise reduction.

UNIT IV

20 Hrs.

Image compression: Fundamentals – models – image formats, compression models.

UNIT V

20 Hrs.

Fundamentals of Color image processing – fundamentals of color models – Thresholding and region based segmentation.

RECOMMENDED TEXTBOOKS:

1. Rafael C. Gonzalez, Richard E. Woods, Digital Image Processing, Pearson Prentice Hall, Third Edition, 2013.
2. Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins, Digital Image Processing Using MATLAB, McGraw Hill Education (India) Private Limited., 2014.

REFERENCE BOOKS:

1. A. K. Jain, “Fundamentals of Digital Image processing”, Prentice Hall of India, New Delhi, 2nd Edition, 1997.
2. Rafael C. Gonzalez, “Digital Image processing using MATLAB”, Richard E. Woods and Steven Low price Edition, Pearson Education Asia, India, 2nd Edition, 2004.
3. William K. Pratt, “Digital Image Processing”, John Wiley & Sons, New Delhi, India, 3rd edition, 2004.
4. Arthur R. Weeks, Jr, “Fundamentals of Electronic Image Processing”, SPIE Optical Engineering Press, New Delhi, India, 2nd Edition, 1996.
5. Mark Nixon & Alberto Aguado, “Feature Extraction and Image Processing for Computer Vision” 3rd Edition.

JOURNALS:

1. www.ciitresearch.org/dip.html
2. <https://link.springer.com/journal/10278>
3. <https://sites.google.com/site/ijcsis/digital-image-processing>

E-LEARNING RESOURCES

1. <https://www.coursera.org/learn/digital>
2. <https://ufonline.ufl.edu/courses/gis4037-digital-image-processing/>
3. <http://www.eucourses.eu/en/courses-available/digital-extra>
4. <https://www.online.colostate.edu/courses/ECE/ECE513.dot>
5. <https://alison.com/tag/digital-image-editing>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Discuss the fundamentals of Digital image processing including the simple image formation and relationship between pixels
CO 2	Analyze the different types of Image transform techniques
CO 3	Outline the different types of Image enhancement techniques in spatial and frequency domain
CO 4	Understand the different types of image degradation like linear image restoration techniques and nonlinear image restoration techniques
CO 5	Apply the image compression like lossy and loss less image compression techniques and also understand the need of image segmentation

MAPPING-CO with PSO:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	3	2	3
CO2	3	2	3	2	3
CO3	3	1	3	2	3
CO4	3	1	3	3	3
CO5	3	3	3	3	3
AVERAGE	3	1.8	3	2.4	3

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving

Seminar

QUESTION PAPER PATTERN-PG:

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A - 10 X 2 marks	50	20	75	Two questions from each Unit
K1. K 2	B - 5/7 X 5 marks	200	25		At least one question from each unit
K2, K 3	C-3/5 X 10 marks	500	30		Compulsory One question from each unit

SEMESTER VI
MAJOR PROJECT AND VIVA VOCE

TOTAL HOURS: 90Hrs

COURSE CODE : 176734

CREDITS : 18

L-T-P : 0-0-18

Students have to undergo project development in reputed industries for the period of 4 Months

**QUAID - E- MILLATH GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS), CHENNAI - 600 002.**

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS



M.Sc., COMPUTER SCIENCE

CHOICE BASED CREDIT SYSTEM OUTCOME BASED EDUCATION

(OFFERED FROM THE ACADEMIC YEAR 2017 -2018)

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Quaid-E-Millath Government College For Women (Autonomous)

Chennai - 600002

Post Graduate Courses

Choice Based Credit System

Quaid-E-Millath Government College for Women (Autonomous) offers the Semester System of education with credits for PG courses. Credit is related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures /tutorials /laboratory work /seminar /project work/ practical training/ viva voce etc to facilitate effective teaching and learning and the credits are assigned accordingly, depending on the content and the specialization.

The credit requirement for a two year PG course shall be 91(81 for core and elective & 10 credits for soft skill papers & internship)

SYSTEM OF CREDITS

Year	No. of Papers			Marks	Credits		
	Core	Elective	Soft Skill		Core	Elective	Soft Skill
I Year	12	0	01	1200	36	0	4
II Year	10	02	01	1200	30	6	4
III Year	04	02	01(Internship)	0600	30	6	2(Internship)
Total	26	04	03	3000	96	12	10

REGULATIONS

1. Duration

a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semesters, the second academic year, the third and fourth semesters.

b. The odd semester shall consist of the period from June to November of each year and the even semesters from December to April of each year.

2. Course of Study

a. The course of study for Postgraduate Degree Courses shall comprise of Core courses & Electives.

b. System of Credits

Year	No. of Papers				Marks	Credits				
	Core	Elective	Extra-Disciplinary Elective	Soft Skill		Core	Elective	Extra-Disciplinary Elective	Soft Skill	Internship
I Year	7	3	1	2	1300	28	9	3	4	2
II Year	4+1 Project Work	2	1	2	1300	32	6	3	4	
Total	12	5	2	4	2600	60	15	6	8	2

3. Passing Minimum

A candidate shall be declared to have passed 9 in each paper / practical of the main subject of study wherever prescribed if she secures NOT LESS THAN 50% of the marks prescribed for the examinations. She shall be declared to have passed the whole examination, if she passes in all papers & practical's wherever prescribed as per scheme of examinations earning 90 credits.

4. Eligibility for the Award of degree

Candidate must secure a minimum of 50% marks in the Semester End Examinations. A candidate must secure 8 credits in soft skills and two credits in internship in addition to 90 credits from core and elective courses to obtain a Post Graduate Degree.

5. Ranking

Candidates who pass all the examinations prescribed for the course in the **FIRST APPEARANCE ALONE** are eligible for Classification/ Ranking/ Distinction.

6. Distribution of marks for Continuous Assessment

Test			Best 2 out of 3	Assignment	Seminar/ Creative Presentation	Model Exam	Attendance	Total	Reduced to
20	20	20	40	25	10	25	10	100	25

PATTERN OF QUESTION PAPER

TIME : 3 Hrs

MAX. MARKS : 75

SECTION A

K1

Answer any TEN out of TWELVE questions :

(10x2=20)

SECTION B

K2, K3

Answer any FIVE out of EIGHT questions:

(5x5=25)

SECTION C

K3

Answer any THREE out of FIVE questions:

(3x10=30)

5. Passing Minimum

A candidate shall be declared to have passed in each paper/practical of the Main subject of study wherever prescribed if she secures **NOT LES THAN 50%** of the marks prescribed for the examination.

6. Eligibility for the Award of Degree

Candidates must secure a minimum of 50% of marks in the End Semester examinations and a minimum of 50% in the aggregate marks (Both End Semester and the Continuous Assessment taken together).

A candidate must secure 8 credits in soft skills and 2 credit in the internship in addition to the 108 credits from Core and Elective courses to obtain the PG Degree of Master of Computer Applications.

7. Ranking

Candidates who have passed all the examination prescribed for the course in the **FIRST APPEARANCE** alone are eligible for Classification/Ranking/Distinction.

PROGRAMME OUTCOMES (POs)

On completion of the Programme, the learner will be able to:

- PO 1** Apply computational knowledge
- PO 2** Identify quality research
- PO 3** Design own curriculum to face competitive world
- PO 4** Acquire tremendous subject knowledge of the subject
- PO 5** Demonstrate quality skills

PROGRAMME SPECIFIC OUTCOME (PSOs)

On completion of the specific programme Master of Computer Applications the student will be able to:

- PSO 1** Understand and apply the principles and Development methodologies of Computer systems.
- PSO 2** Apply standard strategies such as Mathematical knowledge, algorithmic principles knowledge in real-time software project development
- PSO 3** Design the systems using open-source programming environment or commercial environment to deliver quality product for the organization success
- PSO 4** Develop the systems in the variety of areas related to algorithms, networking, web design, data analytics of varying complexity
- PSO 5** Acquaint with the current trends in industrial/research settings and thereby innovate novel solutions to existing problems

PROGRAMME PROFILE -M.SC., COMPUTER SCIENCE

SE M	PA RT	COURSE CODE	TITLE OF THE PAPER	CREDI TS	HOURS/ WK	TOTAL HOURS	CA	S E	TOTA L
I		186801 I	Advanced Data Structures and Algorithms	4	5	90	25	75	100
		186802 II	Web Programming & .NET structures	4	5	90	25	75	100
		186803 ELE I	Artificial Intelligence & Expert System	4	5	90	25	75	100
		186804 ELE II	System Software	4	5	90	25	75	100
		186805 III	Web Programming Lab	3	5	90	25	75	100
		186806 IV	Data Structures and Algorithms Lab	3	5	90	25	75	100

II		186807 V	Operating System Concepts and Shell Programming	4	5	90	25	75	100
		186808 VI	Open Source Technology	4	5	90	25	75	100
		186809 ELE III	Computer Networks and Security	4	5	90	25	75	100
		186810 ED I	Computer Graphics	3	5	90	25	75	100
		186811 VII	Open Source Technology Lab	3	5	90	25	75	100
		186812 VIII	Shell Programming lab	3	5	90	25	75	100
III		186813 IX	Advanced Java Programming	4	5	90		75	100
		186814 ELE IV	Advanced Databases – Concepts & Architecture	4	5	90	25	75	100
		186815 XI	Database Management System Lab	4	5	90	25	75	100
		186816 XII	Advanced Java Concepts Lab	3	5	90	25	75	100
		186817 ELE V	Principles of Compiler Design	4	5	90	25	75	100
		186818 ED II	Object Oriented Analysis and Design	3	5	90	25	75	100
IV		186819 XII	PROJECT WORK AND VIVA VOCE	16					

EVALUATION PATTERN FOR CONTINUOUS ASSESSMENT-UG

INTERNAL VALUATION BY COURSE TEACHER/S

PART I, II AND III-THEORY PAPERS

COMPONENT	TIME	MAX.MARKS	CAMARK
1.TEST I	1 HRS	20 MARKS(TO BE CONVERTED)	20
2. TEST II	1 HRS	20 MARKS (TO BE CONVERTED)	20
3.ASSIGNMENT/SEMINAR/FIELD VISIT			25
4. MODEL EXAMINATION			25
4.ATTENDANCE			10
TOTAL			100

PART III- PRACTICAL PAPERS

COMPONENT	MARKS
1.TEST I	20
2. TEST II	20
3. RECORD/OBSERVATION	25
4. MODEL EXAMINATION	25
4.ATTENDANCE	10

CA QUESTION PAPER PATTERN-PG

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-2X2 marks	50	04	20
K1, K 2	B-1/1x6marks	200	06	
K2, K 3	C-2/2x10 marks	500	10	

RUBRICS FOR CONTINUOUS ASSESSMENT

S.No.	Component	Criteria
1	Assignment	Content Originality Presentation Schematic Representation Diagram Bibliography
2	Seminar	Organisation Subject Knowledge Vidual Aids Confidence level Presentation Communication Language
3	Field Visit	Participation Preparation Attitude Leadership

4	Participation	Answering Questions Clearing Doubts Participating in Group Discussions Regular Attendance

END SEMESTER EVALUATION PATTERN – P.G.,

THEORY PAPERS

SEMESTER I/II/III/IV

DOUBLE VALUATION BYCOURSE TEACHER AND EXTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARKS : 38

PRACTICAL PAPERS

SEMESTER I/II/III/IV

VALUATION BY EXTERNAL EXAMINER AND INTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARK : 38

SOFT SKILLS PAPERS

SEMESTER I/II/III/IV

SINGLE VALUATION BY INTERNAL EXAMINER

MAXIMUM MARKS : 60

PASSING MARKS : 30

PROJECT PAPER

SEMESTER IV

DOUBLE VALUATION BY RESEARCH SUPERVISOR AND EXTERNAL EXAMINER

DISSERTATION : 75

VIVA-VOCE:25

MAXIMUM MARKS : 100

PASSING MARKS : 50

INTERNSHIP

YEAR II

SEMESTER IV

MAXIMUM MARKS : 100

PASSING MARKS : 50

SEMESTER I COURSE PROFILE- M. Sc COMPUTER SCIENCE

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS/WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
186801 I	Advanced Data Structures and Algorithms	4	5	90	4-0-0	25	75	100
186802 II	Web Programming & .NET structures	4	5	90	4-0-0	25	75	100
186803 ELE I	Artificial Intelligence & Expert System	4	5	90	4-0-0	25	75	100
186804 ELE II	System Software	4	5	90	4-0-0	25	75	100
186805 III	Web Programming Lab	3	5	90	0-0-3	25	75	100
186806 IV	Data Structures and Algorithms Lab	3	5	90	0-0-3	25	75	100
	Soft Skill	2						
	TOTAL CREDITS	24						

SEMESTER II COURSE PROFILE- M. Sc COMPUTER SCIENCE

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS/WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
186807 V	Operating System Concepts and Shell Programming	4	5	90	4-0-0	25	75	100
186808 VI	Open Source Technology	4	5	90	4-0-0	25	75	100
186809 ELE III	Computer Networks and Security	4	5	90	4-0-0	25	75	100
186810 ED I	Computer Graphics	3	5	90	3-0-0	25	75	100
186811 VII	Open Source Technology Lab	3	5	90	0-0-3	25	75	100
186812 VIII	Shell Programming lab	3	5	90	0-0-6	25	75	100
	Soft Skill				2			
	TOTAL CREDITS	24						

SEMESTER III COURSE PROFILE-M. Sc COMPUTER SCIENCE

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS/WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
186813 IX	Advanced Java Programming	4	5	90	4-0-0	25	75	100
186814 ELE IV	Advanced Databases – Concepts & Architecture	4	5	90	4-0-0	25	75	100
186815 XI	Database Management System Lab	4	5	90	0-0-8	25	75	100
186816 XII	Advanced Java Concepts Lab	3	5	90	0-0-3	25	75	100
186817 ELE V	Principles of Compiler Design	4	5	90	4-0-0	25	75	100
186818 ED II	Object Oriented Analysis and Design	3	5	90	3-0-0	25	75	100
	Soft Skill	2			2			
	Internship				2			
	TOTAL CREDITS	26						

SEMESTER IV COURSE PROFILE – M. Sc COMPUTER SCIENCE

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS /WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
186919	PROJECT WORK AND VIVA VOCE	18				25	75	100
	TOTAL CREDITS	18						

SEMESTER-I

ADVANCED DATA STRUCTURES AND ALGORITHMS

TOTAL HOURS: 90 Hrs

COURSE CODE: 186801

CREDITS: 4

L-T-P: 4-0-0

COURSE OBJECTIVES:

1. To acquire the knowledge of implementing problem solving techniques.
2. To design, execute the various operations of Tree Data structures.
3. To create and use Hash tables.
4. To analyze and apply the Graph operations.
5. To know about the sorting and searching techniques.

COURSE OUTLINE

UNIT -I**15 Hrs.**

Problem Solving-Introduction-Problem Solving Aspect-Top-down design-Implementation of Algorithms- Program Verification-The Efficiency of Algorithms-The Analysis of Algorithms-Sample Algorithms

UNIT -II**20 Hrs.**

Trees-Preliminaries-Binary Tree – Representations of a Binary Tree-Left Child Right Sibling Data Structures-Expression Tree-The Search Tree ADT-Tree Traversals-Threaded Binary Trees-AVL Trees-Splay Trees-B-Trees-Priority Queues-Need for Priority Queue-Model-Implementation-Binary Heap

UNIT-III**15 Hrs.**

Hashing-Separate Chaining-Open Addressing-Rehashing-Extendible Hashing

UNIT -IV**20 Hrs.**

Graphs-Basic Terminologies-Representation of Graphs-Topological Sort-Graph Traversal-Breadth First Traversal-Shortest Path Algorithm-Unweighted Shortest Paths-Dijkstra's Algorithm-Minimum Spanning Tree-Prim's Algorithm-Kruskal's Algorithm-Depth First Search-Undirected Graph-Bi-Connectivity-Euler Circuits-NP-Complete Problems

UNIT-V**20 Hrs.**

Sorting-Preliminaries-Insertion Sort-Shell Sort-Heap Sort-Merge Sort-Quick Sort-External Sorting-Two-Way Merge-Multi-Way Merge-Polyphase Merge

RECOMMENDED TEXTBOOKS:

1. P.Revathy and S. Poonkuzhali, Data Structures, Revised Edition, Charulatha Publications, 2011.
2. R.G. Dromey, How to Solve it by Computer ,PHI ,1998

REFERENCE BOOKS:

1. Alfred V.Aho, John E. Hopcroft, Jeffrey D. Ullman, Data Structures and Algorithms, Pearson Education, 2002
2. Seymour Lipschutz, Theory and Problems of Data Structures, Schaum's Outline Series, 2016.
3. E. Horowitz, S. Sahni and Mehta, Fundamentals of Data Structures, TMH, 2015
4. Jean Paul Tremblay, Paul G. Sorenson, An Introduction to Data Structures with Applications, TMH, 1995
5. A.K Sharma, Data structures using C, Pearson Education, 2013

JOURNALS:

1. International Journal of Data Structures
2. Journal of Computer and System Sciences

E-LEARNING RESOURCES:

1. <http://cs-fundamentals.com/data-structures/introduction-to-data-structures.php>
2. <https://www.w3schools.in/data-structures-tutorial/data-structures-arrays/>
3. <https://www.cs.cmu.edu/~adamchik/15-121/lectures/LinkedLists/linkedlists.html>
4. <https://www.w3schools.in/data-structures-tutorial/sorting-techniques/>
5. <https://www.cs.auckland.ac.nz/software/AlgAnim/searching.html>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Choose the algorithm to suit the given problem
CO 2	Understand, implement the operations of tree data structures
CO 3	Design their own data structure according to the application need
CO 4	Apply the graph operations in real time
CO 5	Develop any application using the data structures

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	2	2	2
CO2	3	3	2	2	2
CO3	3	2	3	2	2
CO4	3	3	3	3	3
CO5	3	2	2	2	3

AVERAGE	2.8	2.4	2.4	2.2	2.4

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10/12X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER I
WEB PROGRAMMING & .NET STRUCTURES

TOTAL HOURS: 90 hrs

COURSE CODE: 186802

CREDITS : 4

L-T-P : 4-0-0

COURSE OBJECTIVES:

1. Understand the difference between desktop and dynamic web applications.
2. Understand the ASP.NET web application execution model.
3. Create and modify multi-page Web Form applications that involve and demonstrate features such as flow control, the use of style sheets, state management, data access, data binding, security, and data verification and validation.
4. Understand web application configuration and demonstrate the ability to manage basic configuration issues.
5. Create desktop and web applications that consume simple web services.

COURSE OUTLINE:

UNIT I:**15hrs**

Internet Basic – Introduction to HTML – List – Creating Table – Linking document – Frames – Graphics to HTML Doc- Style sheet – Style sheet basic – Add style to document – Creating style sheet rules – Style sheet properties – Font – text – List – Color and background color – Box – Display properties - Introduction to JavaScript – Advantage of JavaScript – JavaScript Syntax – Datatype – Variable – Array – Operator and Expression – Looping Constructor – Function – Dialog box.

UNIT II :**15hrs**

JavaScript document object model – Introduction – Object in HTML – Event handling – Window Object – Document object – Browser Object – Form Object – Navigator object – Screen object – Build in object – User defined object – Cookies

UNIT – III**20hrs**

ASP. NET Languages Structure – Page Structure – Page – Compiler Directives – HTML Server Controls – HTML Anchor Control – HTML Table – HTML Table Row – HTML Table Cell Controls – HTML Form and Form Input Controls – HTML Input File Control – Basic Web Server Controls - Data List Web Server Controls – Calendar Control – Ad Rotator Control – Validation Controls – IE Web Controls – Tree View Control – Tool Bar Control – Tab Strip and Multi Page Controls.

UNIT – IV**20hrs**

User Controls – Zip Code look Up Control – Bullet List Control – Fixed Page Text Control – Request Object – Response Object – Random Numbers - OLEDB Connection Class – OLEDB Command Class – OLEDB Transaction Class – OLEDB Data Adapter Class – Data Set Class – Connecting to a SQL Server Database – Manipulating Data in a SQL Server Database – Retrieving Data from a SQL Server Database – Chat Page – Add To Thread Page – Add Page– SMTP Mail and Mail Message Classes – Attaching a File.

UNIT – V**20hrs**

Creating an ASP.NET Application – Maintaining Session State – Maintaining Application State – Application and Session Objects Sample Application – Global. asax File – Web.Config File – Service Properties – Web Sites Within IIS – Web Site Properties – ASP.NET Applications –Error Handling – No Error Handling – Resume Next – On Error Goto Handler – Resume from Handler – Try/Catch Code Block – Err Object – Using the Custom Errors Section of Web.Config.

RECOMMENDED TEXT BOOKS

1. Greg Buczec, ASP.NET developer's guide, Tata McGraw Hill, First Edition, 2012.
2. I. Bayross, Web enable commercial application development using HTML, DHTML, JavaScript, Perl CGI, - BPB, 20104
3. Dietel, Dietel&Nietc, Internet and World Wide Web – How to program, Pearson Education Publishers, Fourth Edition, 2013

RECOMMENDED REFERENCE BOOKS

1. J. Jaworski, Mastering JavaScript, BPB, 2011
2. T.A. Powell, Complete Reference HTML, TMH Publications, 2010
3. Matthew MacDonald "ASP.NET: The Complete Reference 1st Edition"
4. Andrew Troelsen, "Pro C# 5.0 and the .NET 4.5 Framework", Apress, Sixth edition, 2012.
5. Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson, Morgan Skinner, "Professional C# .NET 4.5", O'Reilly publications, First edition, 2012.

JOURNALS:

1. <http://www.rroij.com/scholarly/programming-language-journals-articles-ppts-list.php>
2. <https://journals.sagepub.com/doi/full/10.1016/j.jala.2006.10.014>

E-LEARNING RESOURCES:

6. <https://www.tutorialspoint.com/vb.net/index.htm>
7. <https://www.guru99.com/vb-net-tutorial.html>
8. <https://www.udemy.com/learning-visual-basic-net/>
9. <https://www.homeandlearn.co.uk/csharp/csharp.html>
10. <https://www.geeksforgeeks.org/introduction-to-net-framework/>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Create interactive Web sites using a combination of HTML and JavaScript.
CO 2	Create desktop and web applications that consume simple web services.
CO 3	Create applications that allow accessing data from a variety of sources in a uniform manner.
CO 4	Apply XML in the .NET environment to create Web Service-based applications
CO 5	Develop the web based applications using ADO.NET in C#

MAPPING-CO with PSO

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	3
CO2	2	3	2	3	2
CO3	2	2	3	3	3

CO4	2	2	3	2	3
CO5	3	3	3	3	2
AVERAGE	2.4	2.6	2.6	2.6	2.6

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture by chalk and talk, Learning through Demonstrations, Assignment, Peer Learning and Seminar.

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10/12X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER-I
ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

TOTAL HOURS: 90 hrs

COURSE CODE: 186803

CREDITS : 4

L-T-P : 4 -0-0

COURSE OBJECTIVES:

To enable the post graduate students

1. To learn the difference between optimal reasoning Vs human like Reasoning
2. Understand the notions of state space representation, exhaustive search, heuristic search along with the time and space complexities.
3. To learn different knowledge representation techniques
4. To understand the applications of AI namely, Game Playing, Theorem Proving, Expert Systems, Machine Learning and Natural Language Processing
5. Implement the use of AI to solve English Communication problems

COURSE OUTLINE:

UNIT – I

15 hrs

Introduction to Artificial Intelligence – Problems, Problems Spaces and Search : Defining the problem as a state space search – Production Systems – Problem Characteristics - Production System Characteristics – Issues in the Design of search Programs – Additional Problems.

UNIT – II

15 hrs

Heuristic Search Techniques: Generate and Test – Hill climbing – Best First Search – Problem Reduction – Constraint Satisfaction - Means Ends Analysis. Knowledge representation Issues:

Representations and Mappings – Approaches to Knowledge Representation – Issues in Knowledge Representation.

UNIT – III

20 hrs

Predicate Logic: Representing Simple Facts in logic – Representing Instance and Isa Relationships – Computable functions and predicates – resolution – Natural Deduction. Procedural versus declarative knowledge – Logic Programming - Forward versus Backward reasoning – Matching – Control Knowledge.

UNIT – IV

20 hrs

Learning : Introduction – Rote Learning – Learning by taking advice – Learning in Problem Solving – Learning from examples – Explanation based Learning – Discovery – analogy – Formal Learning theory – Expert System: Representing and using domain knowledge – expert system shells – explanation – knowledge acquisition.

UNIT – V

20 hrs

Introduction to Expert System : History – Features of an Expert System – Players in Expert System – what good are expert system ? – Organization of Expert system - Expert system vs conventional programs – Activities of Expert system – Expert System Tools - knowledge representation – Nature of Expert system tools – Stages in the development of Expert system tools – Building an Expert system

RECOMMENDED TEXTBOOKS:

1. Stuart Russel, Peter Norvig: Artificial Intelligence A Modern Approach, Pearson 3rd Edition 2017.
2. Elaine Rich, Kevin Knight, Shivashanka B Nair: Artificial Intelligence, Tata McGraw Hill 3rd edition. 2013

REFERENCES

1. Patric Henry Winston, Artificial Intelligence, Third Edition, Pearson Education, 2002
2. Saroj Kaushik, Artificial Intelligence, Cengage learning India Pvt. Ltd., 2012.

3. Artificial Intelligence – Elaine Rich & Kevin Knight Tata McGraw –Hill Edition, Second Edition, 2012
4. A Guide to Expert System – Donald A. Waterman Addison-Wesley Publishing Company, 2013.
5. Nils J. Nilsson, “Artificial Intelligence: A new Synthesis”, Harcourt Asia Pvt. Ltd., 2000.

JOURNALS:

1. <https://www.journals.elsevier.com/science-of-computer-programming>
2. <https://dl.acm.org/citation.cfm?id=576122>

E-LEARNING RESOURCES:

1. <https://www.springer.com/in/book/9783540167822>
2. <https://www.e-booksdirectory.com/listing.php?category=28>
3. <https://nptel.ac.in/courses/109101003/downloads/Lecture.../Lecture-19-20-21.pdf>
4. https://onlinecourses.nptel.ac.in/noc18_cs51
5. <https://nptel.ac.in/courses/106106140>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Analyze the modern view of AI as the study of agents that receive precepts from the environment and perform actions

CO 2	Demonstrate awareness of informed search and exploration methods
CO 3	Demonstrate about AI techniques for knowledge representation, planning and uncertainty management
CO 4	Develop knowledge of decision making and learning methods
CO 5	Implement the use of AI to solve English Communication problems

MAPPING-CO with PSO

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	2	2	3
CO2	2	3	2	3	2
CO3	2	2	3	3	3
CO4	2	0	3	3	3
CO5	3	3	3	3	3
AVERAGE	2.4	2.2	2.6	2.8	2.8

KEY: STRONGLY CORELATED-3, MODERATELY CORELATED-2, WEAKLY CORELATED-1, NO CORRELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-LCD)

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10/12X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER-I
SYSTEM SOFTWARE

TOTAL HOURS: 90hrs

COURSE CODE: 186804

CREDITS: 4

L-T-P: 4-0-0

COURSE OBJECTIVES:

16. To understand the language processor using data structure.
17. To study the Top Down parsers and design of a two pass assembler
18. To study a detail about macros and macro processor.
19. To study the compilers and interpreters that are available to implement sequences.
20. To study the linkers and about software tools

COURSE OUTLINE

UNIT I

20 hrs

Language processors – Language processing activities and fundamentals – Language specification – Development Tools – Data Structures for Language processing- Search Data structures-Allocation Data Structures.

UNIT II

16 hrs

Scanners-Top Down Parsers-.Assemblers: Elements of Assembly language programming - Overview of the Assembly process - Design of a Two-pass Assembler.

UNIT III

18 hrs

Macros and Macro processors – Macro definition, call and expansion – Nested macro calls – Advanced macro facilities - Design of a macro preprocessor.

UNIT IV

19 hrs

Compilers and Interpreters – Aspects of compilation - Memory allocation - Compilation of Expressions and Control structures - Code optimization – Interpreters.

UNIT V

17 hrs

Linkers: Linking and Relocation concepts – Design of a linker – Self relocating Programs — Linking for over-lays – loaders - Software tools: Software tools for program development - Editors - Debug monitors - Programming environments – User interfaces.

RECOMMENDED TEXTBOOKS:

- 3.D. M. Dhamdhare, 2002, Systems Programming and Operating Systems, Tata McGraw-Hill, New Delhi
- 4.A.C.Shalini, System Software, Scitech Publisher

REFERENCE BOOKS:

1. L. L. Beck, 1996, System Software - An Introduction to System Programming, 3rd edition, Addison –Wesley
2. J.Nithyashri, System Software, 2nd Edition, McGraw Hill Education, 2009.
3. Dr.Ikvinderpal Singh, System Software - An Introduction to System Programming, Khanna Book Publishing.
4. Santanu Chattopadhyay, System Software, PHIndia Publication
5. Charanjeet Singh, System Software, Amit Book,

JOURNALS:

7. **A Historical Perspective on Runtime Assertion Checking in Software Development**
8. A Hybrid Approach of Compiler and Interpreter

E-LEARNING RESOURCES:

6. <http://kokilaprof.blogspot.com/2013/01/data-structures-for-language-processing.html>
7. <https://user.phil-fak.uni-duesseldorf.de/~kallmeyer/Parsing/top-down.pdf>
8. http://fmcet.in/CSE/CS2304_uw.pdf
9. <https://sciencrack.com/3-types-of-language-processor-with-differences/>
10. http://users.informatik.uni-halle.de/~brass/oop06/c6_link.pdf

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Study the fundamentals of system software
CO 2	Apply system software principles and practices for developing quality software.
CO 3	Design and develop principles in the constructing the software system.
CO 4	Develop the skills to solve the real time
CO 5	Knowledge that provide the techniques to overcome the existing problems.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-LCD)

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10/12X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER-I
WEB PROGRAMMING – LAB

TOTAL HOURS: 90 hrs

COURSE CODE: 186805

CREDITS: 3

L-T-P: 0-0-3

COURSE OBJECTIVES:

11. Programming environment for ASP.net programs.
12. To develop small interactive web applications using HTML
13. To build dynamic web pages using JavaScript, ASP.NET.
14. Students will gain the skills and project-based experience
15. Needed for entry into web application and development careers.

COURSE OUTLINE

LIST OF PRACTICALS TO BE IMPLEMENTED

90 hrs

1. Library Management System
2. Logistics Management System
3. Textile Management
4. Online Shopping
5. Health Insurance
6. Bank Management System
7. Payroll processing System
8. Inventory Control System
9. Telephone Billing System
10. E-Billing
11. Online sports Website
12. Vehicle Showroom Management System
13. Student Database Maintenance
14. Online Fast Food Management
15. Job Portal Development

RECOMMENDED TEXTBOOKS:

3. Matthew MacDonald, "As.Net",-The Complete Reference 1st Edition
4. Ramesh Bangia," Unix Concepts and Applications"- Learning ASP.Net and C#.Net Paperback – 2012

REFERENCE BOOKS:

6. Professional Asp.Net MVC 5 –Asp.Net – Jon Galloway.
7. ASP.Net Programmer's Reference (English, Paperback, Caison Charles Crawford Jr.),"Asp.Net" – Caison Charles Grawford Jr
8. WILEY INDIA PVT. LTD, Beginning Asp.Net in C#" – Macdonald M
9. Wiley India Pvt Ltd," Asp.Net 4 in C# 2010"- Matthew Macdonald,Adam Freeman.
10. Wiley India Pvt Ltd,"Dot Net 3.5 Programming"-Kogent Learning Solutions Inc.

JOURNALS:

1. Research and application of web development based on ASP.NET 2.0+Ajax
2. Security point of view of Asp.Net application

E-LEARNING RESOURCES:

1. https://www.onlinebuff.com/article_step-by-step-to-use-stored-procedures-in-aspnet-c-with-example_49.html
6. <https://www.c-sharpcorner.com/UploadFile/e83792/asp-net-server-controls/>
7. <https://www.guru99.com/asp-net-controls.html>
8. <https://www.c-sharpcorner.com/UploadFile/ca2535/Asp-Net-repeater-control-using-C-Sharp/>
9. <https://www.c-sharpcorner.com/uploadfile/annathurai/cookies-in-Asp-Net/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Create interactive Web sites using HTML and JavaScript.
CO 2	Create interactive multimedia applications to be delivered on Internet using ASP.NET.
CO 3	Handle to use different Validation Control
CO 4	Apply and Develop a process with Cookies.
CO 5	Apply Error Handling method in asp.net.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

Using Computer in Lab

SEMESTER-I
DATA STRUCTURES AND ALGORITHMS- LAB

TOTAL HOURS: 90 hrs

COURSE CODE: 186806

CREDITS: 3

L-T-P: 0-0-3

COURSE OBJECTIVES:

1. Objective of this course is to train the student to develop application programs using the fundamental data structures
2. To assess how the choice of data structures and algorithm design methods impacts the performance of programs.
3. Solve problems using data structures such as, binary trees, AVL trees; Splay trees, binary search trees, and graphs and writing programs for these solutions.
4. Solve problems using algorithm design methods such as the shortest path, divide and conquer, dynamic programming, backtracking, and branch and bound techniques.
5. Create programs for different sorting techniques and analyse the efficacy of the each algorithm.

COURSE OUTLINE

LIST OF PRACTICALS TO BE IMPLEMENTED

90 hrs

1. Basic operations on Binary Trees

2. Basic operations on Binary Search Trees
3. Binary Tree traversal Techniques
4. Basic operations on AVL Trees
5. Basic operations on Splay Trees
6. Breadth First Search
7. Depth First Search
8. Shortest Path Algorithms
9. Minimal Spanning Tree Algorithm
10. Linear Search and Binary Search
11. Insertion Sort
12. Selection Sort
13. Merge Sort
14. Quick Sort

RECOMMENDED TEXTBOOKS:

1. SeyMourLipschutz ,Theory and Problems of Data Structures,Schaum's Outline Series,2016
2. R.G. Dromey, How to Solve it by Computer ,PHI ,1998

REFERENCE BOOKS:

1. E.Horowitz, S.Sahni and Mehta,Fundamentals of Data structures,TMH,2015
2. Jean Paul Tremblay, Paul G.Sorenson, An Introduction to DataStructures with Applications ,TMH,1995.
3. M. A. Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education Asia,2013.
4. ReemaThareja, "Data Structures Using C", Oxford University Press, 2011.
5. A.V.Aho, J.D.Ullman, J.E.Hopcraft ,Data Structures and Algorithms, ,Wiley India,2014

JOURNALS:

1. International Journal of Data Structures
2. Comparison of Stack and Queue Data structures

E-LEARNING RESOURCES:

1. <http://cs-fundamentals.com/data-structures/introduction-to-data-structures.php>
2. <https://www.includehelp.com/data-structure-tutorial/binary-tree-representation.aspx>
- 3.<https://www.hackerearth.com/practice/data-structures/hash-tables/basics-of-hash-tables/tutorial/>
4. http://btechsmartclass.com/data_structures/graph-representations.html
5. <https://www.studytonight.com/data-structures/introduction-to-sorting>

COURSE OUTCOMES:

CO No.	CO Statements

CO 1	Basic program operations on Binary Trees
CO 2	Basic program operations on AVL Trees
CO 3	Linear Search and Binary Search in data structure.
CO 4	Apply the graph operations in real time
CO 5	Develop Sorting application using the data structures

MAPPING- CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	2	2	2	2	2
CO 2	3	3	2	2	2
CO 3	3	2	3	2	2
CO 4	3	3	3	3	3
CO 5	3	2	2	2	3
Average	2.8	2.4	2.4	2.2	2.4

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Using Computer in Lab

SEMESTER II

OPERATING SYSTEM CONCEPTS AND SHELL PROGRAMMING

TOTAL HOURS: 90 Hrs.

COURSE CODE: 186807

CREDITS: 4

L-T-P: 4-0-0

COURSE OBJECTIVES:

To enable the post graduate students

1. To be aware the fundamental principles of processes and operating system and their communication
2. To comprehend the various functions of process management
3. To comprehend the deadlock and memory management
4. To know about the file management and file system
5. To learn the I/O management

COURSE OUTLINE:

UNIT I

20 Hrs.

Introduction: Definition-Views-Goals- Process management: Process Concepts-Process Scheduling-Cooperating Processes-Inter-process communication. Process Scheduling: Basic concepts-Scheduling Criteria-Scheduling Algorithms- Synchronization: Critical-Section -Deadlocks: Characterization-Methods of handling deadlocks-Deadlock Prevention –Avoidance Detection-Recovery.

UNIT II

15 Hrs.

Memory Management Strategies: Background-Swapping- Contiguous memory allocation-Non-Contiguous Allocation: Segmentation-Paging-Structure of the page table-Virtual Memory Management: Demand Paging-Page Replacement-Page Replacement Algorithms-Thrashing.

UNIT III

15 Hrs.

UNIX: The Unix Operating System-A brief session on Unix-The Unix Architecture-Features of Unix-Locating Commands-Internal and External commands-Command Structure-General Purpose Utilities: cat, date, echo, printf, bc, mailx, passwd, who, uname, tty, stty, Changing the settings, The File System: Introduction-types of files-file name-the parent-child relationship –file handling commands: HOME variable, pwd, cd, mkdir, rmdir-Absolute pathnames and Relative path names-listing directory contents.

UNIT IV

20 Hrs.

Handling Files: commands for handling ordinary files-displaying-creating files-copying files- deleting files- renaming files-paging output-printing file-knowing file types- counting lines- word and characters- displaying data in octal- comparing two files- common in two files- converting between DOS and UNIX-compressing and decompressing files.

UNIT V

20 Hrs.

The Shell: the Shell's Interpretive cycle-pattern matching-the wild card characters-Redirection-Three standard files-command substitution-shell variables-Essential Shell Programming: Shell scripts- read-command line arguments- exit- logical operators- the if conditional-using test-case conditional-

computation and string handling-Looping: while, for-manipulating the positional parameters- the Here document-interrupting a program-Debugging shell scripts.

RECOMMENDED TEXTBOOKS:

1. Abraham Silberschatz and Peter Galvin ,Operating System Concepts, Wiley; 8th Revised edition
2. William Stallings, Operating Systems: Internals and Design Principles, Pearson Education; 2019 edition.

REFERENCE BOOKS:

1. D M Dhamdhere, Operating Systems: A Concept-Based Approach” McGraw Hill Education, 3rd Edition,2017
2. Andrew S.Tanenbaum, Modern operating Systems, PHI Learning Pvt.Ltd,2016
3. Gary J Nutt, Operating Systems: A Modern Perspective, Addison-Wesley Pub.
4. AchyutGodbole, “Operating Systems: With Case Studies in UNIX, Netware, Windows NT”, Tata-McGraw Hill, 2011.
5. Brian W.Kernighan, Rob Pike, “The Unix Programming Environment”, Pearson Education, 2002.

JOURNALS:

- 1.<http://stmjournals.com/Journal-of-Operating-Systems-development-and-Trends>
- 2.<https://www.elsevier.com/catalog/computer-science/software/operating-systems>

E-LEARNING RESOURCES:

1. <https://www.coursera.org/courses?query=operating%20system>
2. <https://www.udacity.com/course/introduction-to-operating-systems--ud923#>
3. <https://www.coursera.org/lecture/technical-support-fundamentals/memory-management-CKcxg>
4. <https://www.coursera.org/lecture/technical-support-fundamentals/files-and-file-systems-5n8dt>
5. <https://www.coursera.org/lecture/technical-support-fundamentals/files-and-file-systems-5n8dt>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Understand the operating system components and its services
CO 2	Able to demonstrate the functions of process management and issues
CO 3	Able to synchronize and deadlock among processes
CO 4	Apply memory management concepts in OS
CO 5	Able to understand the file system recent OS

MAPPING- CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	3	2	2	2	3
CO 2	3	3	2	2	2
CO 3	2	2	3	2	2
CO 4	2	3	3	3	2
CO 5	3	2	2	3	3
Average	2.6	2.4	2.4	2.4	2.4

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving

Seminar

QUESTION PAPER PATTERN-PG

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10/12X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8 X 5 marks	200	25		At least one question from each unit
K2, K 3	C-3/5 X 10 marks	500	30		Compulsory One question from each unit

SEMESTER II
OPEN SOURCE TECHNOLOGY

TOTAL HOURS : 90 Hrs

COURSE CODE: 186808

CREDITS : 4

L-T-P : 4-0-0

COURSE OBJECTIVES:

- 1.Understand why Python is a useful scripting language for developers.
- 2.Learn how to design and program Python applications.
- 3.Learn how to use lists, tuples, and dictionaries in Python programs.
- 4.Learn how to identify PHP objects and Design PHP programs.

5.Learn how to connect SQL as back end.

COURSE OUTLINE:

UNIT I

15 hrs

Welcome to Python: What is Python? – Origins – Features – Downloading and Installing Python – Running Python – Python Documentation – Comparing Python. Getting Started: Program Output statement – Program Input function. Python Basics – Statements and syntax – Variable Assignment – Identifiers. Numbers: Introduction – Integers – Double Precision Floating Point Numbers – Complex Numbers – Operators – Built-in and Factory Functions.

UNIT II

20hrs

Sequences: Strings, Lists and Tuples – Sequences – Strings – Strings and Operators – StringOnly Operators – Built-in Functions – String Built-in Methods – Lists – Operators - Built-in Functions – List Type Built-in Methods – Tuples – Tuple Operators and Built-in Functions - Mapping and Set Types: Dictionaries – Mapping Type Operators – Mapping Type Built-in Functions and Built-in Methods – Dictionary Keys.

UNIT III

15hrs

PHP Language Basics: PHP & HTML – Getting Started – Basics of PHP: Datatypes – Variables – Constants – Operators – Arrays – Conditional Statements – Iterations.

UNIT IV

20hrs

Functions: User-Defined Functions – Built-in Functions – PHP Server Variables – Working with Date and Time – Performing Mathematical Operations – Working with String Functions – Working with Forms: The Main <FORM> tag – FORM Elements – Adding Elements to a FORM – Uploading Files to the Web Server using PHP.

UNIT V

20hrs

MySQL: Introducing tables – Creating tables – data types – modifiers – primary keys – altering tables – Inserting data – Updating columns and fields – Deleting and Selecting data – Retrieving columns and rows – Sorting data – making comparisons.

RECOMMENDED TEXT BOOKS

3. Ivan Bayross, “Web Enabled Commercial Application Development using HTML, JavaScript, DHTML and PHP”, BPB Publications, 4th Revised Edition.
4. Wesley J. Chun, “Core Python Programming”, 2nd Edition, Pearson Education LPE, 2007.

5. Mike Mcgrath, "PHP & MySQL in easy steps", Tata McGraw-Hill Edition 2012.

RECOMMENDED REFERENCE BOOKS

1. Steven Holzner, "PHP: The Complete Reference", McGraw Hill Professional, 2008.
2. Mark Summerfield, "Programming in Python 3- A Complete Introduction to the Python Language", 2nd Edition, Addison-Wesley Professional, 2010.
3. Seyed M. M. Tahaghoghi, "Learning MySQL", Orelly publications 2006.
4. "Setting up LAMP: Getting Linux, Apache, MySQL, and PHP and working Together", Eric Rosebrock, Eric Filson, Published by John Wiley and Sons, 2004.
5. Fadi P. Deek, James A. M. McHugh, Open Source Technology and Policy, Cambridge University Press, 2008.

JOURNALS

<https://joss.theoj.org>

<http://stmjournals.com/Journal-of-Open-Source-Developments.html>

E-LEARNING RESOURCES

1. <http://php.net/manual/en/langref.php>
2. https://www.tutorialspoint.com/python/python_gui_programming.htm
3. <http://www.mysqltutorial.org/what-is-mysql/>
4. Swayam- Computational Science and Engineering using python.
5. Nptel- Data Structures and algorithms using python

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Obtain knowledge and develop application programs using Python.
CO 2	Create dynamic Web applications such as content management, user registration using Python.
CO 3	Create dynamic Web applications such as content management, user registration using PHP.
CO 4	To understand the ability to post and publish a PHP website.
CO 5	Develop a MySQL database and establish connectivity using MySQL. Analyze images in the frequency domain using various transforms.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	2
CO2	3	2	2	3	3
CO3	3	2	2	3	3

CO4	3	2	2	3	3
CO5	3	2	2	2	3
AVERAGE	3	2	2	2.6	2.8

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving

Seminar

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10/12X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER II – ELECTIVE PAPER III
COMPUTER NETWORKS AND SECURITY

TOTAL HOURS: 90 hrs

COURSE

CODE186809

CREDITS: 4

L-T-P : 4-0-0

COURSE OBJECTIVES:

The PG students will be able to

- 1.To know the basic computer network technology, data communications system , reference models, network topologies and protocols.
2. To recognize the functionality of various protocols in Data link and Network layer.
- 3.Toanalyze the steps involved in algorithms belong to the Transport layer.
- 4.To understand Internet Transport Protocol service models, message formatting and its connection establishment.
5. Able to identify and classify system security threats like viruses and develop security

algorithms to prevent, detect and recover from attacks.

COURSE OUTLINE:

UNIT I

10 Hrs.

Introduction: Network hardware – Software – Reference Models: OSI and TCP/IP. Example Networks: Internet - 3G Mobile Networks – Wireless LANs – RFID and Sensor Networks. Physical Layer: Guided transmission Media - Wireless Transmission – Communication Satellites – Digital Modulation and Multiplexing – Telephones Network Structure – local loop – trunks and multiplexing.

UNIT II

20 Hrs.

Data Link Layer: Design Issues – services – Framing – error Control – flow Control – Error detection and Correction. Elementary Data Link Protocols: Simplex Protocol, Sliding Window Protocols: Network Layer: Design Issues - Routing Algorithms: The Optimality Principle – Shortest Path – Flooding – Distance Vector – Linked-state – Hierarchical – Broadcast – Multicast Routing.

UNIT III

20 Hrs.

Congestion Control Algorithms: Traffic-Aware routing, Admission Control, Traffic throttling, Load Shedding. Transport Layer: Transport Service – Berkeley Sockets - Elements of Transport Protocol: Addressing – Connection Establishment – Releasing a connection - Error Control and Flow Control – Multiplexing – Crash Recovery.

UNIT IV

20 Hrs.

Internet Transport Protocol: TCP – Introduction – Service Model – Protocol – TCP Segment header – Connection Establishment – Connection Release. Application Layer : DNS – Domain Resource

Records – Name Server – Electronic Mail – Architecture and Services – User Agent – Message Format – Message Transfer – Final Delivery – www: Architectural Overview – Static Web Document.

UNIT V

20 Hrs.

Network Security: Cryptography – Introduction - Substitutional Ciphers – Transposition Cipher. Symmetric-Key Algorithms: DES – AES. Public Key Algorithm: RSA – Digital Signatures: Symmetric Key Signatures- Public Key Signatures. Firewalls – Email Security:PGP – PEM. Web Security: Threats – Secure Naming – SSL.

RECOMMENDED TEXTBOOKS:

5. William Stallings, "Cryptography And Network Security – Principles and Practices", Pearson, Sixth Edition, 2015.
6. AtulKahate, "Cryptography and Network Security", Tata McGraw-Hill, 2013.

REFERENCE BOOKS:

1. Bruce Schneier, "Applied Cryptography", John Wiley & Sons Inc, 2011.
2. Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Third Edition, Pearson Education, 2013.
3. [Behrouz A Forouzan, Debdeep Mukhopadhyay](#) Cryptography & Network Third Edition
Security, Paperback – 2016
4. Juanita Ellis, Tim Speed, William P. Crowell, "The Internet security Guide book: From planning to development" Academic Press, February 2001.
5. Jan Killmeyer Tudor, "Information security Architecture:An Integrated Approach to security in the organization" CRC Press, September 2000.

JOURNALS:

1. <https://wireilla.com/ijcis/index.html>

2. <https://www.journals.elsevier.com/network-security>

E-LEARNING RESOURCES:

11. <https://freevidelectures.com/course/5027/cryptography-and-network-security>
12. <https://www.coursera.org/lecture/cryptography/public-key-encryption-40Sb3>
13. <https://www.coursera.org/learn/asymmetric-crypto>
14. <https://www.udacity.com/course/applied-cryptography--cs387>
5. <https://www.udacity.com/course/computer-networking--ud436>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Impart knowledge on Encryption techniques, Design Principles and Modes of Operation
CO 2	Design a security solution for a given application
CO 3	Devise the Key Management techniques
CO 4	Create an understanding of Authentication functions the manner in which Message Authentication Codes and Hash Functions works.
CO 5	Examine the issues and structure of Authentication Service and Electronic Mail Security

MAPPING-CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	2	2	2	3
CO 2	2	3	2	3	3
CO 3	2	2	2	3	3
CO 4	3	2	3	3	2
CO 5	3	3	3	3	3
Average	2.4	2.4	2.6	2.8	2.8

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture by chalk and talk.

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10/12X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER-II

COMPUTER GRAPHICS

TOTAL HOURS: 90 Hrs.

COURSE CODE: 186810ED I

CREDITS: 3

L-T-P: 3-0-0

COURSE OBJECTIVES:

1. To objectives of this course are to learn about the various 2D algorithms.
2. To implement them for performing simple animations.
3. Aims to have an understanding about the different graphic devices and GUI.
4. To impart complete understanding about 3D.
5. To study and transformation algorithms and the colour models.

COURSE OUTLINE

UNIT I

13 Hrs.

A survey of computer graphics – Overview of Graphics Systems: Video display devices: Refresh Cathode Ray tubes, Raster-scan displays, Random-scan displays, Color CRT Monitors, Direct-View Storage tubes, Flat-Panel Displays – Raster scan systems- Random scan systems - Input Devices.

UNIT II

17 Hrs.

Output Primitives: Points and lines - Line Drawing Algorithms: DDA, Bresenham's – Circle Generating Algorithms: Properties, Midpoint Circle Algorithm – Filled-Area Primitives: Boundary Fill algorithm, Flood Fill algorithm – Attributes of Output Primitives: Line Attributes-Curve Attributes- Color and Grayscale levels – Area Fill Attributes-Character Attributes

UNIT III

20 Hrs.

Two-dimensional Geometric Transformations: Basic Transformations – Matrix Representations and Homogeneous coordinates – Composite Transformations – Other Transformations – Transformation between coordinate systems. Two-Dimensional Viewing: Viewing Pipeline – Window-to-viewport coordinate transformation – Clipping Operations – Point Clipping – Line Clipping: Cohen-Sutherland line clipping, Liang-Barsky line clipping – Polygon Clipping – Sutherland-Hodgeman Polygon clipping – Curve clipping – Text Clipping – Exterior Clipping.

UNIT IV

20 Hrs.

Graphical User Interfaces and Interactive Input Methods: The User dialogue - Input of graphical data – Interactive Picture construction techniques. Three-dimensional concepts: Three-Dimensional Display methods – Three-Dimensional Geometric and Modeling Transformations: Translation, Rotation, Scaling, and Other Transformations – Composite Transformations

UNIT V

20 Hrs.

Visible- Surface Detection Methods – Classification of Visible-Surface Detection Algorithms - Back-face detection - Depth buffer method- Scan line method – Color Models and Color Applications: Properties of light – Intuitive Color Concepts – RGB color model – YIQ color model – Computer Animation: Design of Animation Sequences – Motion Specifications.

CASE STUDY: Academic discipline and the purpose of it is to give thorough analysis about a certain case or situation that reveals wonderful information

TOOLS: MATLAB / PYTHON

RECOMMENDED TEXTBOOKS:

1. Andries van Dam; F. Hughes John; James D. Foley; Steven K. Feiner “Computer Graphics Principles and Practice in C” - Second Edition.
2. Donald Hearn, M. Pauline Baker (2004), “Computer Graphics - C Version” - Second Edition, PHI.

REFERENCE BOOKS:

1. 1.W.M.Newmann and R.F.Sproull (1979), “Principles of Interactive Computer Graphics”, McGraw Hill.
2. Foley, Van Dan, Feiner, Hughes (2000), “Computer Graphics” - Addison Wesley
3. A K Peters/CRC Press; 3 edition (21 July 2009),”Fundamentals of Computer Graphics” - Peter Shirley
4. Version 1-2, January 2018-**Ron Goldman**,”Introduction to Computer Graphics”- David J. Eck
5. S Chand Publishing; Fourth edition (1 January 2015),”-Computer Graphics”- Dr. Rajiv Chopra

JOURNALS:

1. Improved Line Drawing Algorithm: An Approach and Proposal

2. An efficient line drawing algorithm for parallel machines

E-LEARNING RESOURCES:

1. <https://circuitglobe.com/cathode-ray-tube-crt.html>
2. <https://www.javatpoint.com/computer-graphics-bresenham-circle-algorithm>
3. <https://www.javatpoint.com/computer-graphics-homogeneous-coordinates>
4. <https://www.javatpoint.com/computer-graphics-3d-graphics>
5. <http://www.cs.cityu.edu.hk/~helena/cs31622000B/Chap11Notes.pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Review the fundamental concepts of a Computer Graphics
CO 2	Analyze algorithm in the frequency domain using various transforms.
CO 3	Two-dimensional Geometric techniques.
CO 4	Graphical techniques for image enhancement and image techniques.
CO 5	Classification of Visible-Surface Detectionrepresentation techniques.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10/12X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER-II
OPEN SOURCE TECHNOLOGY LAB

TOTAL HOURS: 90 Hrs.

COURSE CODE: 186811

CREDITS: 3

L-T-P: 0-0-3

COURSE OBJECTIVES:

6. To understand why Python is a useful scripting language for developers.
7. To learn how to design and program Python applications.
8. To learn how to use lists, tuples, and dictionaries in Python programs.
9. To learn the use of PHP to develop web based applications and to upload files to web server using PHP
10. To learn to create and manipulate tables in MySQL and to learn to use query language to retrieve data from MySQL Tables.

COURSE OUTLINE

Python

1. Develop a Python program using functions.
2. Develop a Python program to implement mathematical operations.
3. Develop a Python program to implement Array operations.
4. Develop a Python program to implement String functions.
5. Develop a Python program to implement List operations.
6. Develop a Python program to implement Tuple operations.
7. Develop a Python program to implement Dictionary operations.

PHP

8. Develop a PHP program to manipulate Student Performance using Switch case.
9. Develop a PHP program to implement Logic gates.
10. Develop a PHP program to perform Array sorting.
11. Develop a PHP program to perform String functions.
12. Develop a PHP program to perform Mathematical functions.
13. Develop a PHP program to perform Array functions.

MySQL

14. Write a SQL statement to create table and insert data into the table.
15. Write a SQL statement to update the entries in the table.
16. Write a SQL statement to sort the entries in the table.
17. Write a SQL statement to compare the entries in the table.
18. Write a SQL statement to delete the entries in the table.

RECOMMENDED TEXTBOOKS:

6. Ivan Bayross, "Web Enabled Commercial Application Development using HTML, JavaScript, DHTML and PHP", BPB Publications, 4th Revised Edition.
7. Wesley J. Chun, "Core Python Programming", 2nd Edition, Pearson Education LPE, 2007.
8. Mike Mcgrath, "PHP & MySQL in easy steps", Tata McGraw-Hill Edition 2012.

REFERENCE BOOKS:

1. Mark Summerfield, "Programming in Python 3- A Complete Introduction to the Python Language", 2nd Edition, Addison-Wesley Professional, 2010.
2. Martin C. Brown, "Python The Complete Reference", McGraw Hill
3. Steven Holzner, "PHP: The Complete Reference", McGraw Hill Professional, 2008.
4. Seyed M. M. Tahaghoghi, "Learning MySQL", O'reilly publications 2006.
5. Robin Nixon, "Learning PHP, MySQL, JavaScript, and CSS: A Step-by-Step Guide to Creating Dynamic Websites", Second Edition, O'reilly publications

JOURNALS:

7. International Journal of Computer Science and Programming Language
8. <https://ojs.pythonpapers.org/index.php/tpp>

E-LEARNING RESOURCES:

11. <https://learnpythonbreakpython.com/>
12. <https://assets.digitalocean.com/books/python/how-to-code-in-python.pdf>
13. <http://php.net/manual/en/langref.php>
14. <https://education.fsu.edu/wp-content/uploads/2015/04/Learning-PHP-MySQL-JavaScript-and-CSS-2nd-Edition-1.pdf>
15. <https://education.fsu.edu/wp-content/uploads/2015/04/Learning-PHP-MySQL-JavaScript-and-CSS-2nd-Edition-1.pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Apply the fundamentals of Python programming language.
CO 2	Apply the learning of Python functions in solving problems.
CO 3	Explain the use of PHP in webpage development.
CO 4	To apply the learning of PHP functions and upload files in Web servers using PHP
CO 5	To be able to create tables in MySQL, insert, update and delete and retrieve records from MySQL tables using queries.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5

CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	3	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	2	2.4	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Using Computers in Lab

SEMESTER-II

Shell Programming Lab

TOTAL HOURS: 90hrs

COURSE CODE: 186812

CREDITS: 3

L-T-P: 0-0-6

COURSE OBJECTIVES:

16. To work with the basic commands of Linux/ Unix.
17. To work with the Shell scripts for various simple applications.
18. To work with Filters using various commands.
19. To work with Files, Directories and zero sized Files from current directory.
20. To gain knowledge to do Shell and System Call programming.

COURSE OUTLINE

LIST OF PRACTICALS TO BE IMPLEMENTED

90 hrs

1. Study of Basic commands of Linux/UNIX.
2. Study of filters of Linux/UNIX.
3. Write a shell script to generate mark sheet of a student. Take 3 subjects, calculate and display total marks, percentage and Class obtained by the student.

4. Write a shell script to find factorial of given number n.
5. Write a shell script which will accept a number b and display first n prime numbers as output.
6. Write a shell script which will generate first n Fibonacci numbers like: 1, 1, 2, 3, 5, 13,...
7. Write a menu driven shell script which will print the following menu and execute the given task.
8. Display calendar of current month
9. Display today's date and time
10. Display usernames those are currently logged in the system
11. Display your terminal number
12. Exit
13. Write a shell script to read n numbers as command arguments and sort them in descending order.
14. Write a shell script to display all executable files, directories and zero sized files from current directory.
15. Write a shell script to check entered string is palindrome or not.
16. Shell programming using filters (including grep, egrep, fgrep)

RECOMMENDED TEXTBOOKS:

5. Abraham Silberschatz Peter Baer Galuin,GregGange, "Operating System Concepts",John Wiley & Sons,Ninth Edition,2016
6. Sumitabha Das , " Unix Concepts and Applications",Tata McGraw-Hill ,2012

REFERENCE BOOKS:

11. The Complete Reference –Linux , Sixth Edition Richard Petersen.
12. Learning Linux Shell ScriptingGanesh SanjivNaik.
13. Shell Programming in Unix, Linux and OS X Paperback – 20 Dec 2016by [Stephen G. Kochan](#) (Author), [Patrick Wood](#) (Author).
14. Mastering Linux Shell Scripting,: A practical guide to Linux command-line, Bash scripting, and Shell programming, 2nd Edition Kindle Editionby [Mokhtar Ebrahim](#) (Author), [Andrew Mallett](#) (Author).
15. Mastering Unix Shell Scripting: Bash, Bourne, and Korn Shell Scripting for Programmers, System Administrators, and UNIX Gurus 2nd Edition, Kindle Editionby [Randal K. Michael](#) (Author).

JOURNALS:

1. Journal of Advances in Shell Programming
2. Shell Scripting and Shell Programming in Unix –ijirt

E-LEARNING RESOURCES:

1. <https://www.guru99.com> › must-know-linux-commands
2. <https://www.macs.hw.ac.uk> › ~hwloidl › Courses › LinuxIntro
3. <https://linuxhint.com> › 30_bash_script_examples
4. <https://www.guru99.com> › linux-pipe-grep
5. <https://www.tecmint.com> › linux-file-operations-commands

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Apply basic commands of LINUX/UNIX
CO 2	Apply and Design Shell Scripts for applications
CO 3	Handle to use different strategies of Shell Scripts.
CO 4	Apply and Develop a process using Filters
CO 5	Acquaint to perform shell scripts for various applications

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Using Computers in Lab

SEMESTER-III

ADVANCED JAVA PROGRAMMING

TOTAL HOURS: 90 hrs

COURSE CODE:

186813

CREDITS: 4

L-T-P : 4-0-0

COURSE OBJECTIVES:

To enable the post graduate students

1. To understand the importance of Enterprise Applications, role of JDBC
2. To learn, develop the server side and client side components
3. To create and send Java mail and JMS
4. To analyze and apply the Enterprise components
5. To use the Frameworks.

COURSE OUTLINE

UNIT – I

15 Hrs.

APPLET PROGRAMMING: Difference between Application and Applets – Applet Life cycle – creating an Executable Applet – Designing a Web Page – Adding Applet to HTML File – Passing Parameters to Applets - Swings

UNIT – II

15 Hrs.

Networking Basics Java and the Net – InetAddress – TCP/IP Client Sockets – URL –URL Connection – TCP/IP Server Sockets – A Caching Proxy HTTP Server – Datagrams

UNIT – III

20 Hrs.

Servlet overview – Servlet Life Cycle – your first servlet – Generic Servlet – HttpServlet – Parameter Passing to Servlet – Java WebServer – JDBC- Java Database Connectivity Introduction - Introduction JDBC Drivers - JDBC connectivity -Prepared Statement & Result Set – JDBC Stored procedures invocation

UNIT IV

20 Hrs.

RMI – Overview – Developing applications with RMI:Declaring& Implementing remote interfaces- stubs &skeletons, Registering remote objects, writing RMI clients –Pushing data from RMI Servlet - JSP –Introduction JSP-Examining MVC and JSP -JSP scripting elements & directives-Working with variables scopes-Error Pages

UNIT V

20 Hrs.

Java Beans – Introduction – BDK Demonstration Beans – Saving and Restoring Bean – Building an Applet BeanBox – Creating your own bean - JFA- **EJB**: EJB architecture- EJB requirements – Javabeanbridge for ActiveX -other Bean Development Tools

RECOMMENDED TEXTBOOKS:

1. Krishnamoorthy : "Internet and Programming with java"
2. J. McGovern, R. Adatia, Y. Fain, 2003, J2EE 1.4 Bible, Wiley-dreamtech India Pvt. Ltd, New Delhi.
3. H. Schildt, 2002, Java 2 Complete Reference, 5th Edition, Tata McGraw-Hill, New Delhi.

REFERENCES

1. K. Moss, 1999, Java Servlets, Second edition, Tata McGraw Hill, New Delhi.
2. D. R. Callaway, 1999, Inside Servlets, Addison Wesley, Boston
3. Joseph O'Neil, 1998, Java Beans from the Ground Up, Tata McGraw Hill, New Delhi.
4. Tom Valesky, Enterprise JavaBeans, Addison Wesley.
5. Cay S Horstmann & Gary Cornell, Core Java Vol II Advanced Features, Addison Wesley.

JOURNALS:

1. <https://www.journals.elsevier.com/science-of-computer-programming>
2. <http://java.sys-con.com/>

E-LEARNING RESOURCES:

1. <https://www.udemy.com/course/how-to-connect-java-jdbc-to-mysql/>
2. <https://www.udemy.com/course/jsp-servlet-free-course/>
3. <https://www.udemy.com/course/java-message-service-jms-fundamentals/>
4. <https://www.udemy.com/course/the-java-ee-course/>
5. <https://www.udemy.com/course/advanced-java-programming-java-se-7-vtc/>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Know the importance of Enterprise Applications, role of JDBC
CO 2	Understand ,implement the server side and client side components
CO 3	Understand the Javamail, JMS components
CO 4	Learn and apply EJB in Enterprise applications
CO 5	Understand Frameworks in the realtime application development

MAPPING-CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	2	2	2	3	2
CO 2	2	3	2	2	2

CO 3	3	2	3	2	2
CO 4	3	3	3	3	2
CO 5	3	2	2	2	2
Average	2.6	2.4	2.4	2.4	2

KEY: STRONGLY CORELATED-3, MODERATELY CORELATED-2, WEAKLY CORELATED-1, NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

QUESTION PAPER PATTERN-PG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10/12X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER III
ADVANCED DATABASES – CONCEPTS & ARCHITECTURE

TOTAL HOURS: 90 Hrs.

COURSE CODE: 186814

CREDITS: 4

L-T-P: 4-0-0

COURSE OBJECTIVES:

To enable the post graduate students

- 1 To understand the basics of database, data models and various structure of SQL statements.
- 2 To the introduction of ER models, various constraints and the normalization techniques.
- 3 To expose the different types of data storage medium, RAID Architecture and indexing techniques.
- 4 To impart knowledge in Transaction processing, Concurrency Control and Recovery System.
- 5 To understand the concepts of concurrency control, the protocols used and various recovery algorithms during transaction failures. Also students gains knowledge about the servers oracle and Microsoft SQL server.

COURSE OUTLINE:

Unit – I

20 Hrs.

Relational Model: Introduction - Structure of Relational Database - Relational Algebra - Relational Calculus. **Relational Query Languages:** Introduction - Codd's Rules - Structured Query Language - Embedded Structured Query Language. **ER Model:** Basic Concepts - Conversion of ER Model into Relations - ER Diagram Symbols.

Unit – II

15 Hrs.

Data Base Design: Introduction - Software Development Life Cycle - Database Development Life Cycle - Automated Design Tools. **Functional Dependency and Decomposition:** Functional Dependency - Decomposition. **Normalization:** Introduction - Normalization - Normal Forms - BCNF - 4 NF - 5 NF.

Unit – III

15 Hrs.

Query Processing and Optimization: Introduction - Query Processing - Syntax Analyzer - Query Decomposition - Query Optimization. **Transaction Processing and Concurrency Control:** Transaction Concepts - Concurrency Control - Locking Methods - Timestamp Methods - Optimistic Methods.

Unit – IV

20 Hrs.

Data Base Recovery Systems: Introduction - Recovery Concepts - Types of Failures - Types of Recovery - Recovery Techniques - Buffer Management. **Database Security:** Goals - Firewalls - Data Encryption.

Unit – V

20 Hrs.

Distributed Database Systems: Introduction - Distributed Databases - Architecture of Distributed Databases - Distributed Database System Design - Distributed Query Processing. **Emerging Database**

Technologies: Internet Databases - Digital Libraries - Multimedia Databases - Mobile Databases - Spatial Databases.

RECOMMENDED TEXTBOOKS:

- 1 Abraham Silberschatz , Henry F. Korth , S. Sudarshan “ Database System concepts, 6th Edition, McGraw Hill Education, 2013.
- 2 C.J.Date, A.Kannan, S.Swamynathan, “An Introduction to Database Systems”, Eighth Edition, Pearson Education, 2006.
- 3 Raghu Ramakrishnan, “Database Management Systems”, 4th Edition, Tata Mcgraw Hill 2011.

REFERENCE BOOKS:

- 1 Ivan Bayross , “SQL, PL/SQL: The Programming Language of Oracle”, BPB Publications , 2002
- 2 Elmasri, Navathe, “Fundamentals of Database Systems”, 5th Edition, Pearson Education (2008).
- 3 Jeffrey A. Hoffer, Ramesh Venkataraman, , HeikkiTopi, “Modern Database Management”, Pearson Education 2016
- 4 Jeffrey A. Hoffer, Mary B. Prescott, Fred R. McFadden, “Modern Database Management” 8th Edition, Prentice Hall, 2006
- 5 Mark L. Gillenson, Fundamentals of Database Management Systems, 2nd Edition, Kindle Edition

JOURNALS:

- 1 <https://www.journals.elsevier.com/data-and-knowledge-engineering>
- 2 <https://www.scimagojr.com/journalsearch.php?q=13581&tip=sid>

E-LEARNING RESOURCES:

- 1 <https://nptel.ac.in/courses/106105175/>
- 2 <http://codex.cs.yale.edu/avi/db-book/db6/slide-dir/>
- 3 <https://www.cse.iitb.ac.in/~sudarsha/db-book/slide-dir/>
- 4 <https://www.coursera.org/learn/database-management>
- 5 <https://www.coursera.org/learn/core-database>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Understand the fundamentals of the database and data models and SQL
CO 2	Design a database using ER diagrams and map ER into Relations and compare the normalized relations by I NF, II NF, III NF, IV NF and BCNF
CO 3	Know the different physical media for storage, different file organizations and understand how indexing and hashing used for effective storage of databases
CO 4	Acquire the knowledge of query evaluation and optimization to monitor the performance of the DBMS

CO 5	Illustrate various concurrency control protocols and recovery algorithms from failures. Construct a mini project using servers like Oracle or Sql Server as backend

MAPPING-CO with PSO:

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	2	3	2	3	2
CO 2	2	3	3	3	3
CO 3	3	2	2	2	2
CO 4	3	2	2	3	3
CO 5	2	3	3	2	3
Average	2.4	2.4	2.4	2.6	2.6

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving

Seminar

QUESTION PAPER PATTERN-PG

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10/12X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/7 X 5 marks	200	25		At least one question from each unit
K2, K 3	C-3/5 X 10 marks	500	30		Compulsory One question from each unit

SEMESTER III

DATABASE MANAGEMENT SYSTEMS LAB

TOTAL HOURS: 90 Hrs.

COURSE CODE: 186815

CREDITS: 4

L-T-P: 0-0-8

COURSE OBJECTIVES:

To enable the post graduate students

- 1.To understand the concepts of DBMS
- 2.To familiarize with SQL queries
- 3.To write stored procedures in DBMS
- 4.To learn front end tools to integrate with databases.

COURSE OUTCOME:

CO No	CO Statements
CO1	To learn various fundamental and complex SQL queries
CO2	Learn to develop a project in the area of their interest

Students have to develop a project based on their choice and submit a report at the end of the semester

MAPPING-CO with PSO:

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	3	2	2	3
CO 2	3	3	2	2	2
Average	3	3	2	2	2.5

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

QUESTION PAPER PATTERN:

Knowledge Level	Section-A	Marks	Total

K2, K3	1 Question	45	75
K3, K4	1 Question	30	

LIST OF PRACTICAL TO BE IMPLEMENTED

Bus Transport Management System

Course Administration System

Election Voting System

Hospital Management System

Library Management System

Railway Management System

SEMESTER-III

ADVANCED JAVA CONCEPTS LAB

TOTAL HOURS: 90 hrs

COURSE CODE: 186816

CREDITS: 3

L-T-P: 0-0-3

COURSE OBJECTIVES:

1. Objective of this course is to give practical training in Event handling, Java Server Programming like Servlets, JSP, JDBC and RMI.
2. After undergoing this laboratory module, the student should be able to:-
3. Develop simple programs using applet and event handlers
4. Create dynamic web pages, using Servlets, JSP and JDBC.
5. Develop Stateful, Stateless and Entity Beans.

LIST OF PRACTICALS TO BE IMPLEMENTED

90 hrs

1. Implementation of Simple Applet Programming
2. Implementation of Applet using Layout
3. Implementation of Applet with graphics
4. Implementation of Event handling – Mouse
5. Implementation of Event handling – Keyboard
6. Implementation of Event handling – Action Listener
7. Implementation of Simple Frames
8. Implementation of Swings

9. Chatting using Applet with TCP/IP
10. Chatting using UDP/IP
11. Create and manage the database using JDBC
12. Implementation of Servlet using Generic
13. Implementation of Servlet using HTTP
14. Implementation - passing parameters to servlet
15. Working with RMI
16. Implementation of JSP

RECOMMENDED TEXTBOOKS:

1. Java The Complete Reference Ninth Edition, "Java",-Herbert Schildt
2. The Complete Reference J2EE 1.41," J2EE"- Keogh Jim

REFERENCE BOOKS:

1. Second Edition–Programming in Java – Sachin Malhotra
2. SIE – 1 Jul 2017,"Java Fundamentals" – Herbert Schildt
3. How to program tenth edition, "Java" – Paul Dltel
4. Java EE6 (J2EE 1.6)," Java Server Programming"- Black Book
5. The Complete Reference,"JSP"-Phil Hanna

JOURNALS:

1. A Software Architecture for Java Programming Learning Assistant System
2. Study on Design and Implementation of JAVA Programming

E-LEARNING RESOURCES:

- a. <https://www.geeksforgeeks.org/java-applet-basics/>
- b. <https://www.geeksforgeeks.org/mouselistener-mousemotionlistener-java/>
- c. <https://www.geeksforgeeks.org/performing-database-operations-java-sql-create-insert-update-delete-select/>
- d. <https://www.geeksforgeeks.org/remote-method-invocation-in-java/>
- e. <http://mrbool.com/working-with-java-server-pages-jsp/29048>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Apply basic program in Applet.
CO 2	Implementation of Event handling – Keyboard
CO 3	To implementation of Swings
CO 4	Program in Servlet using HTTP
CO 5	Working with RMI and JSP.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Using Computer in Lab

SEMESTER-III
PRINCIPLES OF COMPILER DESIGN

TOTAL HOURS:90 hrs

COURSE CODE: 186817

CREDITS: 4

L-T-P : 4-0-0

COURSE OBJECTIVES:

The PG students will be able to:

6. To introduce the major concept areas of language translation and compiler design
7. To develop an awareness of the function and complexity of modern compilers
8. To understand the phases of the compilation process and be able to describe the purpose and implementation approach of each phase.
9. To give students practical exposure to aspects of theoretical Computer Science including Languages, Grammars, and Machines.
10. To exercise and reinforce prior programming knowledge with a non-trivial programming project to construct a compiler.

COURSE OUTLINE

UNIT I - LEXICAL ANALYSIS

15 hrs

Introduction to Compiling- Compilers-Analysis of the source program-The phases-Cousins-The grouping of phases-Compiler construction tools. The role of the lexical analyzer- Input buffering-Specification of tokens-Recognition of tokens-A language for specifying lexical analyzer.

UNIT II - SYNTAX ANALYSIS and RUN-TIME ENVIRONMENTS 25 hrs

Syntax Analysis- The role of the parser-Context-free grammars-Writing a grammar-Topdown parsing-Bottom-up Parsing-LR parsers-Constructing an SLR(1) parsing table. Type Checking- Type Systems-Specification of a simple type checker. Run-Time Environments-Source language issues-Storage organization-Storage – allocation strategies.

UNIT III- INTERMEDIATE CODE GENERATION 20 hrs

Intermediate languages-Declarations-Assignment statements - Boolean expressions - Case statements - Back patching - Procedure calls

UNIT IV - CODE GENERATION 15 hrs

Issues in the design of a code generator- The target machine-Run-time storage management-Basic blocks and flow graphs- Next-use information-A simple code generator-Register allocation and assignment-The dag representation of basic blocks -
Generating code from dags.

UNIT V - CODE OPTIMIZATION 15 hrs

Introduction-The principle sources of optimization-Peepphole optimization-Optimization of basic blocks-Loops in flow graphs- Introduction to global data-flow analysis-Code improving transformations.

RECOMMENDED TEXTBOOKS:

3. Alfred V. Aho, Ravi Sethi Jeffrey D. Ullman, “Compilers- Principles, Techniques, and Tools”, Pearson Education Asia, 2013.
4. Alfred V Aho, Monica S. Lam, Ravi Sethi, Jeffrey D Ullman , "Compilers Principles, Techniques and Tools", 2nd Edition, Pearson Education, 2011.

REFERENCES:

1. David Galles, “Modern Compiler Design”, Pearson Education Asia, 2014.
2. Steven S. Muchnick, “Advanced Compiler Design & Implementation”, Morgan Kaufmann Publishers, 2013.
3. C. N. Fisher and R. J. LeBlanc “Crafting a Compiler with C”, Pearson Education, 2012.
4. A.V. Aho, J.D.Ullman, Principles of Compiler Design, NarosaPub-House, 2013.
5. D.Gries, Compiler Construction for Digital Computers, John Wiley & Sons, 2009.

JOURNALS:

- 1.<http://www.serialspublications.com/journals/journal-detail.php?jid=66>
- 2.<https://link.springer.com/article/10.1007/s10766-005-35906>
- 3.http://www.academia.edu/Documents/in/Compiler_Design

E-LEARNING RESOURCES:

6. <https://nptel.ac.in/courses/106108052/>
7. <https://www.coursera.org/lecture/nand2tetris2/unit-4-2-lexical-analysis-QM0lZ>
8. <https://www.coursera.org/lecture/nand2tetris2/unit-4-1-syntax-analysis-5pC2Z>
9. <https://nptel.ac.in/courses/106104072/>
10. <https://nptel.ac.in/courses/106104072/>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Demonstrate a working understanding of the process of semantic analysis through the construction of semantic records based on parse trees
CO 2	The construction of symbol tables,
CO 3	The organization of run time memory and the writing of a semantic analyzer for a compiler.
CO 4	Design, analyze, implement and test a working compiler for a small language
CO 5	Develop a compiler with all the phases

MAPPING-CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	2	2	3
CO 2	3	3	2	3	3
CO 3	2	2	2	3	3
CO 4	3	2	3	3	2
CO 5	3	3	2	3	3
Average	2.8	2.4	2	2.8	2.8

KEY: STRONGLY CORELATED-3, MODERATELY CORELATED-2, WEAKLY CORELATED-1, NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-LCD)

QUESTION PAPER PATTERN-PG

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10/12X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/8 X 5 marks	200	25		At least one question from each unit
K2, K 3	C-3/5 X 10 marks	500	30		Compulsory One question from each unit

SEMESTER-III

OBJECT ORIENTED ANALYSIS AND DESIGN

TOTAL HOURS: 90 Hrs

COURSE CODE:

CREDITS: 03

L-T-P: 3-0-0

COURSE OBJECTIVES:

- 1.To know the importance of modeling concept for object orientation in system development.
2. To learn the basics of Object Oriented Analysis and Design skills
- 3.To develop the system using Unified Modeling Language (UML).
- 4.To apply UML for representation of an object-oriented system using different modeling views.
5. To impart knowledge about quality assurance tests and its strategies.

COURSE OUTLINE

UNIT I

15 Hrs.

System Development - Object Basics - Development Life Cycle - Methodologies - Patterns - Frameworks - Unified Approach - UML.

UNIT II

20 Hrs.

Use-Case Models - Object Analysis - Object relations - Attributes - Methods – Class and Object responsibilities - Case Studies.

UNIT III**20 Hrs.**

Design Processes - Design Axioms - Class Design - Object Storage - Object Interoperability - Case Studies.

UNIT IV**15 Hrs.**

User Interface Design - View layer Classes - Micro-Level Processes - View Layer Interface - Case Studies.

UNIT V**20 Hrs.**

Quality Assurance Tests - Testing Strategies - Object orientation on testing - Test Cases - test Plans - Continuous testing - Debugging Principles - System Usability - Measuring User Satisfaction - Case Studies.

RECOMMENDED TEXTBOOKS:

1. Ali Bahrami, Object Oriented Systems Development, Tata McGraw Hill International Edition, Reprint 2009.
2. Stephen R. Schaach, "Introduction to Object Oriented Analysis and Design", Tata McGraw-Hill, 2004.

REFERENCE BOOKS:

1. Mark Priestley, Practical Object-Oriented Design with UML, Tata McGraw Hill, second Edition, 2005
2. James Rumbaugh, Ivar Jacobson, Grady Booch, The Unified Modeling Language Reference Manual, Addison Wesley, 2nd edition, 2005.
3. Craig Larman, Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development, Third Edition, Pearson Education, 2005.
4. Meilir Page-Jones, Fundamentals of Object Oriented Design in UML, Pearson Education,

2003.

5. Atul Kahate, Object Oriented Analysis & Design, Tata McGraw Hill, 2004.

JOURNALS:

1. Journal of Engineering Education Transformations
2. International Research Journal of Computer Science

E-LEARNING RESOURCES:

1. <https://study.com/academy/lesson/five-basic-concepts-of-object-oriented-design.html>
2. <https://www.uml-diagrams.org/uml-object-oriented-concepts.html>
3. <https://www.techopedia.com/definition/21104/object-oriented-analysis-and-design-ooad>
4. <https://airbrake.io/blog/design-patterns/object-oriented-analysis-and-design>
5. https://www.tutorialspoint.com/object_oriented_analysis_design/ooad_object_oriented_model.html

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand the concepts and principles of OOAD
CO 2	Analyze major components of Class and Object diagrams.
CO 3	Analysis and Design the requirements through use case driven approach.
CO 4	Apply UML for representation of an object-oriented system.
CO 5	Compare and contrast various testing techniques.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	2	2	3	2	2
CO 2	3	2	2	3	3
CO 3	2	3	2	3	1
CO 4	3	3	1	2	3
CO 5	3	1	3	2	3
AVERAGE	2.6	2.2	2.2	2.4	2.4

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

QUESTION PAPER PATTERN:

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10/12X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

**QUAID - E- MILLATH GOVERNMENT COLLEGE FOR WOMEN
(AUTONOMOUS), CHENNAI - 600 002.**

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS



B.SC., COMPUTER SCIENCE

CHOICE BASED CREDIT SYSTEM OUTCOME BASED EDUCATION

(OFFERED FROM THE ACADEMIC YEAR 2017 -2018)

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**Quaid-E-Millath Government College for Women (Autonomous),
Chennai – 600 002.**

Undergraduate Courses

Choice Based Credit System

Quaid-E-Millath Government College for Women (Autonomous), offers the Semester System of Education with credits for UG courses. Credit simply means the weightage given to what is taught and what is learnt. It is normally related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures / tutorials / laboratory work / seminar / project work / practical training / viva voce etc to facilitate effective teaching and learning and the credits are assigned accordingly, depending on the content and the specialization.

The minimum credit requirement for a three – year UG course shall be 140 inclusive of Part IV and Part V.

REGULATIONS

1. Duration

- a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semester, the second academic year, the third and fourth semesters and the third academic year, the fifth and sixth semester.
- b. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year.

2. Course of Study

The course of study for bachelor Degree Courses shall comprise of the following:

Foundation Courses:

The courses shall comprise the study of:

- i) Part - I Tamil - 6 Credits for B.A. and B.Sc.; 4 Credits for B.Com.
- ii) Part – II English – 6 Credits for B.A and B.Sc.; 4 Credits for B.Com.

Part III:

- a. Core Subjects (B.A.-79 Credits; B.Sc. - 79 Credits and 91 Credits– B.Com.)
- b. Allied Subjects (20 Credits for B.A., B.Sc., and B.Com.)

Part IV:

- c. Soft Skill (4 Papers) (8 Credits)
- d. Non-Major Elective (2 Papers) (4 Credits)
- e. Environmental Studies (2 Credits)
- f. Value Education (2 Credits)

Part V:

- g. Extension Activities (1 Credit)

3. Compulsory Extension Service

A candidate shall be awarded a maximum of one credit for Compulsory Extension Service. All students shall have to enroll for NSS/NCC/Sports and Games/Rotary/Youth Red Cross or any other service organization in the College and shall have to put in compulsory attendance of 40 hours, which shall be duly certified. If a student lacks 40 hours attendance in the First year, she shall have to compensate the same during the subsequent years.

Distribution of Marks for Continuous Assessment

Part I, Part II and Part III

Test			Best 2 out of 3	Assignment	Seminar / Creative Presentation	Model Exam	Attendance	Total	Reduced to
20	20	20	40	10	15	25	10	100	25

Test (Best two out of three) : 40 Marks

Assignment/ Seminar /

Creative Presentation : 25 Marks

Model Examination : 25 Marks

Attendance : 10 Marks

Total (Internal) : 100 Marks reduced to 25

Calculation of Attendance Marks

90 – 100%	-	10 Marks
80 – 89%	-	9 Marks
75 – 79%	-	8 Marks
65 – 74%	-	7 Marks
55 – 64%	-	5 Marks
Below 55%	-	0 – Not Eligible

End Semester Examination : Question Paper Format

K1 : 10 x 2 = 20 Marks (10 out of 10)

K2,K3 : 5 x 5 = 25 Marks (5 out of 8)

K3 : 3 x 10 = 30 Marks (3 out of 5)

Total (External) : 75 Marks

Part IV:

Semester End Examination : 60 Marks

Continuous Internal Assessment : 40 Marks

Distribution of CIA Marks:

Seminar / Presentation	Assignment / Term Paper	Written / Oral Test	Total
20	10	10	40

End Semester Examination : Theory Paper – 60 Marks – Duration 2.30 hours.

Question Paper Pattern : 10 x 6 Marks = 60 Marks (10 out of 15)

PATTERN OF QUESTION PAPER

TIME : 3 Hrs

MAX.MARKS : 75

SECTION A

K1

Answer any TEN out of TWELVE questions:

(10x2=20)

SECTION B

K2, K3

Answer any FIVE out of EIGHT questions:

(5x5=25)

SECTION C

K3

Answer any THREE out of FIVE questions:

(3x10=30)

5. Passing Minimum

A candidate shall be declared to have passed in each paper/practical of the Main subject of study wherever prescribed if she secures **NOT LES THAN 50%** of the marks prescribed for the examination.

6. Eligibility for the Award of Degree

Candidates must secure a minimum of 50% of marks in the End Semester examinations and a minimum of 50% in the aggregate marks (Both End Semester and the Continuous Assessment taken together).

A candidate must secure 8 credits in soft skills and 2 credit in the internship in addition to the 108 credits from Core and Elective courses to obtain the PG Degree of Master of Computer Applications.

7. Ranking

Candidates who have passed all the examination prescribed for the course in the **FIRST APPEARANCE** alone are eligible for Classification/Ranking/Distinction.

PROGRAMME OUTCOMES (POs)

On completion of the Programme, the learner will be able to:

PO 1	Apply Practical and mathematical skill in all aspects
PO 2	Identify quality knowledge of the subject
PO 3	Utilize the subject knowledge and communication skills to appear for competitive exams
PO 4	Acquire theoretical, practical and mathematical knowledge
PO 5	Analyse the basic computational skills

PROGRAMME SPECIFIC OUTCOME (PSOs)

PSO 1	Understand the structure and methodological aspects of the computer system
PSO 2	Apply basic skills and principles in problem solving through various hands on exercises

PSO 3 Provide advanced knowledge in of computer science to solve real world problem.

PSO 4 Develop skills in software development

PSO 5 Exhibit proficiency through latest technologies by demonstrating the programming skill and apply the same for various domain

PROGRAMME PROFILE -B.SC., COMPUTER SCIENCE

SE M	PAR T	COURSE CODE	TITLE OF THE PAPER	CREDITS	HOUR S/WK	TOTAL HOURS	CA	SE	TOTA L
I	I		LANGUAGE – TAMIL - PAPER - I	3	4	90	25	75	100
	II		ENGLISH – PAPER - I	3	6	90	25	75	100
	III	172701	PROGRAMMING SKILLS USING C	5	6	90	25	75	100
	III	172702	C PROGRAMMING - LAB	5	6	90	25	75	100
	III ALLI ED I	172791	NUMERICAL AND STATISTICAL METHODS	5	6	90	25	75	100
	IV		NON MAJOR ELECTIVE	2	2		25	75	100
			SOFTSKILL I	2			25	75	100

TOTAL CREDITS FOR SEMESTER I				25						
II	I		LANGUAGE – TAMIL - PAPER - II	3	4	90	25	75	100	
	II		ENGLISH – PAPER - II	3	6	90	25	75	100	
	III	172703	OBJECT ORIENTED PROGRAMMING USING C++	4	6	90	25	75	100	
	III	172704	C++ PROGRAMMING - LAB	4	6	90	25	75	100	
	III	ALLIED II	172792	OPERATIONS RESEARCH	5	6	90	25	75	100
	IV		NON MAJOR ELECTIVE	2	2		25	75	100	
			SOFTSKILL II	2			25	75	100	
TOTAL CREDITS FOR SEMESTER II				23						
III	I		LANGUAGE – TAMIL - PAPER - III	3	6	90	25	75	100	
	II		ENGLISH – PAPER - III	3	6	90	25	75	100	
	III	172705	DATA STRUCTURES	4	6	90	25	75	100	
	III	172706	DATA STRUCTURES LAB USING C++	4	5	90	25	75	100	
	III		MATHEMATICS I	5	5	90	25	75	100	
	IV		SOFTSKILL III	2			25	75	100	
TOTAL CREDITS FOR SEMESTER III				21						
IV	I		LANGUAGE – TAMIL - PAPER - IV	3	6	90	25	75	100	
	II		ENGLISH – PAPER - IV	3	6	90	25	75	100	
	III	172707	JAVA PROGRAMMING CONCEPTS	4	6	90	25	75	100	
	III	172708	JAVA PROGRAMMING - LAB	4	5	90	25	75	100	
	III	Allied			5	90	25	75	100	
			MATHEMATICS II	5						
			SOFTSKILL IV	2			25	75	100	

			ENVIRONMENTAL STUDIES	2	1		25	75	100
			EXTENSION ACTIVITIES	1	1		25	75	100
TOTAL CREDITS FOR SEMESTER IV				24					
V	MAJ OR IX	172709	DIGITAL COMPUTER FUNDAMENTALS	4	6	90	25	75	100
	MAJ OR X	172710	DATABASE MANAGEMENT SYSTEM	4	6	90	25	75	100
	MAJ OR XI	172711	VISUAL PROGRAMMING	4	6	90	25	75	100
	ELE CTIV E I	172712	COMPUTER GRAPHICS	5	6	90	25	75	100
	MAJ OR XII	172713	VISUAL PROGRAMMING LAB	4	6	90	25	75	100
TOTAL CREDITS FOR SEMESTER V				21					
VI	MAJ OR XIII	172714	OPERATING SYSTEMS	5	6	90	25	75	100
	MAJ OR XIV	172715	DATA COMMUNICATION AND NETWORKING	5	6	90	25	75	100
	ELE CTIV E II	172716	SOFTWARE ENGINEERING AND TESTING	5	6	90	25	75	100
	ELE CTIV E III	172717	WEB TECHNOLOGY	5	6	90	25	75	100
	MAJ OR XV	172718	MINI PROJECT	4	6	90	25	75	100
			VALUE EDUCATION	2			25	75	100

EVALUATION PATTERN FOR CONTINUOUS ASSESSMENT-UG

INTERNAL VALUATION BY COURSE TEACHER/S

PART I, II AND III-THEORY PAPERS

COMPONENT	TIME	MAX.MARKS	CAMARK
1.TEST I	1 HRS	20 MARKS(TO BE CONVERTED)	20
2. TEST II	1 HRS	20 MARKS (TO BE CONVERTED)	20
3.ASSIGNMENT/SEMINAR/FIELD VISIT			25

4. MODEL EXAMINATION	25
4.ATTENDANCE	10
TOTAL	100

PART III- PRACTICAL PAPERS

COMPONENT	MARKS
1.TEST I	1 HRS 20 MARKS(TO BE CONVERTED) 20
2. TEST II	1 HRS 20 MARKS (TO BE CONVERTED) 20
3. RECORD/OBSERVATION	25
4. MODEL EXAMINATION	25
4.ATTENDANCE	10
TOTAL	100

CA QUESTION PAPER PATTERN-UG

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A-2X2 marks	50	04	20
K1, K 2	B-1/1x6marks	200	06	
K2, K 3	C-2/2x10 marks	500	10	

RUBRICS FOR CONTINUOUS ASSESSMENT

S.No.	Component	Criteria
1	Assignment	Content Originality Presentation Schematic Representation Diagram Bibliography
2	Seminar	Organisation Subject Knowledge Vidual Aids Confidence level Presentation Communication Language
3	Field Visit	Participation Preparation Attitude Leadership
4	Participation	Answering Questions Clearing Doubts Participating in Group Discussions Regular Attendance

END SEMESTER EVALUATION PATTERN – U.G.,

THEORY PAPERS

SEMESTER I/II/III/IV/V/VI

PART I/II/III

SINGLE VALUATION BY EXTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARK : 30

PART IV

SINGLE VALUATION BY INTERNAL EXAMINER

WRITTEN TEST

MAXIMUM MARKS : 60

PASSING MARK : 24

PRACTICAL PAPERS

PART III

SEMESTER I/II/III/IV/V/VI

VALUATION BY EXTERNAL EXAMINER AND INTERNAL EXAMINER

MAXIMUM MARKS : 75

PASSING MARK : 30

SEMESTER I COURSE PROFILE - B.Sc., COMPUTER SCIENCE

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS/W K	TOTAL HOURS	L-T-P	CA	SA	TOTAL
	LANGUAGE – TAMIL - PAPER – I	3	5	90		25	75	100
	ENGLISH – PAPER - I	3	5	90		25	75	100
172701	PROGRAMMING SKILLS USING C	5	6	90	4-2-0	25	75	100
172702	C PROGRAMMING – LAB	5	6	90	0-0-4	25	75	100
172791	NUMERICAL AND STATISTICAL METHODS	5	6	90	4-2-0	25	75	100
	NON MAJOR ELECTIVE	2	1	90		25	75	100
	SOFTSKILL I	2	1	90		25	75	100

SEMESTER II COURSE PROFILE - B.Sc., COMPUTER SCIENCE

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS/W K	TOTAL HOURS	L-T-P	CA	SA	TOTAL
	LANGUAGE – TAMIL - PAPER – II	3	5	90		25	75	100
	ENGLISH – PAPER - II	3	5	90		25	75	100
172703	OBJECT ORIENTED PROGRAMMING USING C++	4	6	90	4-0-0	25	75	100

172704	C++ PROGRAMMING - LAB	4	6	90	0-0-4	25	75	100
172792	OPERATIONS RESEARCH	5	6	90	5-0-0	25	75	100
	NON MAJOR ELECTIVE	2	1	90		25	75	100
	SOFTSKILL II	2	1	90		25	75	100

SEMESTER III COURSE PROFILE - B.Sc., COMPUTER SCIENCE

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS/ WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
	LANGUAGE – TAMIL - PAPER - III	3	5	90		25	75	100
	ENGLISH – PAPER - III	3	5	90		25	75	100
172705	DATA STRUCTURES	4	6	90	4-0-0	25	75	100
172706	DATA STRUCTURES LAB USING C++	4	6	90	0-0-4	25	75	100
	MATHEMATICS I	5	6	90		25	75	100
	SOFTSKILL III	2	1	90		25	75	100

SEMESTER IV COURSE PROFILE - B.Sc., COMPUTER SCIENCE

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS/ WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
	LANGUAGE – TAMIL - PAPER - IV	3	5	90		25	75	100
	ENGLISH – PAPER - IV	3	5	90		25	75	100
172707	JAVA PROGRAMMING CONCEPTS	4	6	90	4-0-0	25	75	100
172708	JAVA PROGRAMMING - LAB	4	6	90	0-0-4	25	75	100
	MATHEMATICS II	5	6	90		25	75	100
	SOFTSKILL IV	2	1	90		25	75	100
	ENVIRONMENTAL STUDIES	2	1	90		25	75	100

SEMESTER V COURSE PROFILE - B.Sc., COMPUTER SCIENCE

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS/WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
172709	DIGITAL COMPUTER FUNDAMENTALS	4	5	90	4-2-0	25	75	100
172710	DATABASE MANAGEMENT SYSTEM	4	5	90	4-0-0	25	75	100
172711	VISUAL PROGRAMMING	4	6	90	4-2-0	25	75	100
172712	COMPUTER GRAPHICS	5	6	90	4-2-0	25	75	100
172713	VISUAL PROGRAMMING LAB	4	6	90	0-0-4	25	75	100

SEMESTER VI COURSE PROFILE - B.Sc., COMPUTER SCIENCE

COURSE CODE	TITLE OF THE PAPER	CREDITS	HOURS /WK	TOTAL HOURS	L-T-P	CA	SA	TOTAL
172714	OPERATING SYSTEMS	5	5	90	5-0-0	25	75	100
172715	DATA COMMUNICATION AND NETWORKING	5	5	90	3-3-0	25	75	100
172716	SOFTWARE ENGINEERING AND TESTING	5	6	90	5-0-0	25	75	100
172717	WEB TECHNOLOGY	5	6	90	4-2-0	25	75	100
172718	MINI PROJECT	4	6	90	4-0-0	25	75	100
	VALUE EDUCATION	2	1	90		25	75	100

SEMESTER I

PROGRAMMING SKILLS USING C

TOTAL HOURS: 90 hrs

COURSE CODE: 172701

CREDITS: 5

L-T-P: 4 2 0

COURSE OBJECTIVES:

1. To make the students know the Structures of C Language.
2. To enable the students to write programs using the concepts of C.
3. To learn how to write loops and decision statements using C

4. Ability to work with arrays of complex objects
5. Students will be able to develop, design and code programs and applications in C

COURSE OUTLINE:

UNIT I

15 Hrs.

C Fundamentals – Character set – Identifier and Keywords – Data types – Constants– Variables– Declarations– Expressions– Statements – Operators – Library functions.

UNIT II

20 Hrs.

Data input and Output Functions – Simple C programs– Flow of Control–If -IfElse - While- Do-while - For loop- Nested Control Structures –Switch– Break and Continue- Go to Statements- Comma Operator.

UNIT III

20 Hrs.

Functions – Definitions – Prototypes – Passing Arguments – Recursion - Storage Classes– Automatic External- Static and Register Variables

UNIT IV

15 Hrs.

Arrays – Defining and Processing – Passing Arrays to Functions – Multidimensional Arrays – Arrays and String – Structures – User Defined Data Types – Passing Structures to Functions –Self –Referential Structures–Union– Bitwise Operators.

UNIT V

20 Hrs.

Pointers– Declarations–Passing Pointers to Functions– Operation in Pointers–Pointer and Arrays – Arrays of Pointers –Structures and Pointers– Files- Creating-Processing- Opening and Closing a Data File.

RECOMMENDED TEXTBOOKS:

1. Ananthi Sheshasaayee & Sheshasaayee, “ C Programming ”, Margham Publications, 2000
2. E.Balaguruswamy, “Programming in ANSI C”, MC Craw Hill, Seventh Edition, 2016.

REFERENCE BOOKS

6. B.W.Kernighan and D.M.Ritchie ,”The C programming language”, PHI, 2012
7. H.Schildt, “C: The Complete Reference”, TMH, Fourth Edition, 2012.
8. Gottfried,B.S., “Programming with C”, Schaum’s Outline Series, Third Edition, TMH, 2010
9. Introduction to C programming, 2nd Edition ,Reema Thareja,Oxford Press.

10. Gottfried B.S., Programming with C, Second Edition, TMH Pub. Co. Ltd., New Delhi, 1996.

JOURNALS:

1. <https://www.journals.elsevier.com/journal-of-computer-languages>
2. National research paper on C language -IJIRT
3. International Journal of Computer Science and Programming Language

E-LEARNING RESOURCES:

1. <https://fresh2refresh.com/c-programming/c-basic-program/>
2. <https://users.cs.cf.ac.uk>
3. <https://www.codesdope.com/c-structure/>
4. <https://www.tutorialcup.com/cprogramming/decision-making-and-loops.html>
5. <https://fresh2refresh.com/c-programming/c-file-handling/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Apply the basic fundamentals of C programming.
CO 2	Explain various loops and decision making statements to solve the problem.
CO 3	To apply different operations on arrays and use functions concepts to solve the given problem.
CO 4	Use of pointers, structures and unions.
CO 5	To analyse file operations in C programming.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	3	2	2	3	3
CO2	3	2	2	3	3	2
CO3	3	2	2	3	3	3
CO4	3	2	2	3	3	3
CO5	3	2	3	2	2	3
AVERAGE	3	2.2	2.2	2.6	2.8	2.8

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

- Lecture (Chalk and Talk)
- Problem Solving
- Peer Learning

QUESTION PAPER PATTERN-UG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER I

C PROGRAMMING LAB

TOTAL HOURS: 90 HRS

COURSE CODE: 172702

CREDITS: 5

L-T-P: 0-0-4

COURSE OBJECTIVES:

1. To understand the basic concept programming using basic commands of C.
2. To learn the C language structure using declarations, variables and data types.
3. To write their own programs using all the concepts learned in the theory.

COURSE OUTLINE :

LIST OF PROGRAMS

1. Simple C programs
2. Programming skill using Control statements
3. Using nested control structures
4. Using Functions
5. Using Recursion
6. Sorting using Arrays
7. Searching in Arrays
8. Passing Arrays to functions
9. Study of multidimensional arrays
10. String manipulations
11. Structures
12. Operations on Pointers
13. Pointers and Arrays
14. Operations on data files

RECOMMENDED TEXTBOOKS:

1. Ananthi Sheshasaayee & Sheshasaayee, “ C Programming ”, Margham Publications, 2000
2. E.Balaguruswamy, “Programming in ANSI C”, MC Craw Hill, Seventh Edition, 2016.

REFERENCE BOOKS

1. B.W.Kernighan and D.M.Ritchie ,”The C programming language”, PHI, 2012
2. H.Schildt, “C: The Complete Reference”, TMH, Fourth Edition, 2012.
3. Gottfried,B.S., “Programming with C”, Schaum’s Outline Series, Third Edition, TMH, 2010
4. Introduction to C programming, 2nd Edition ,Reema Thareja,Oxford Press.
5. Gottfried B.S., Programming with C, Second Edition, TMH Pub. Co. Ltd., New Delhi, 1996.

JOURNALS:

1. <https://www.journals.elsevier.com/journal-of-computer-languages>
2. National research paper on C language -IJIRT
3. International Journal of Computer Science and Programming Language

E-LEARNING RESOURCES:

1. <https://fresh2refresh.com/c-programming/c-basic-program/>
2. <https://users.cs.cf.ac.uk>
3. <https://www.codesdope.com/c-structure/>
4. <https://www.tutorialcup.com/cprogramming/decision-making-and-loops.html>
5. <https://fresh2refresh.com/c-programming/c-file-handling/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Apply the basic fundamentals of decision making and looping concepts of C programming.
CO 2	Compute C programs using Arrays
CO 3	To apply different user defined data types to solve the given problem.
CO 4	Compute C programs using Structures.
CO 5	Use of pointers concepts

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	3	2	2	3	3
CO2	3	2	2	3	3	2
CO3	3	2	2	3	3	3
CO4	3	2	2	3	3	3
CO5	3	2	3	2	2	3
AVERAGE	3	2.2	2.2	2.6	2.8	2.8

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

- Practical Demonstration.

Practical question paper will be framed by the External Examiner from the practical question bank kept in the Department.

SEMESTER I

NUMERICAL AND STATISTICAL METHODS

TOTAL HOURS: 90hrs

COURSE CODE: 172791

CREDITS: 5

L-T-P: 4-2-0

COURSE OBJECTIVES:

21. To study the different methods using algebraic and transcendental equation.
22. To study the correlation and rank correlation in statistical methods.
23. To understand a detailed concepts of sampling.
24. To study the Large samples and Chi-square
25. To study Analysis of Variance in One way and Two way classification methods.

COURSE OUTLINE

UNIT I

23 hrs

Solutions Of Algebraic And Transcendental Equations – Bisection Method, Iteration Method, Regular Falsi Method, Newton–Raphson Method – Solution Of Simultaneous Linear Equations – Gauss–

Elimination Method, Gauss–Siedel Method - Numeric Integration using Trapezoidal, Simpsons's one-third, three-eighths formula.

UNIT II **15**
hrs

Correlation coefficient – Rank Correlation coefficient of determination – Method of Least Squares – Fitting of the curve of the form $ax+b$, ax^2+bx+c , ax^3+bx^2+cx+d .

UNIT III **18**
hrs

Concept of sampling – Methods of sampling – Simple random sampling – Systematic sampling and stratified random sampling (descriptions only) – concepts of sampling distributions and standard error – point estimation (concepts only) – Interval estimation of mean and proportion – Tests of Hypotheses – Critical region – Two types of Errors – Level of Significance – Power of the test.

UNIT IV **19**
hrs

Large sample tests for mean and proportion – Exact tests based on Normal, T, F and Chi-square distributions.

UNIT V **15**
hrs

Basic principles of experimentation – Analysis of variance – One way and Two way classifications.

RECOMMENDED TEXTBOOKS:

5. P Singaravelu, Numerical Methods, Meenakshi Agency, 2014
6. S P Gupta, Statistical Methods, Sulthan Chand and Sons Publishers, 2011

REFERENCE BOOKS:

6. E. Balagurusamy, Numerical Methods, TMH, 2004
7. V. Rajaraman, Computers Oriented Numerical Methods, Second Edition, EEE, 2008
8. AK. S. Trivedi – Probability and Statistics with reliability Queuing and computer Science Applications , Prentice Hall India, EEE, 2012
9. Sant Sharan Mishra, Computer Oriented Numerical and Statistical Methods, PHI publication, 2013
10. Kamalendra kumar and Rakesh Kumar, Computer Based Numerical and Statistical Techniques, CBS publishers.

JOURNALS:

9. A New Approach of Newton's Method using Simpson's Rule
10. Using ANOVA to Examine the Relationship between Safety & Security and Human Development.

E-LEARNING RESOURCES:

1. http://www.bspublications.net/downloads/0523a9f25106ff_M_III_ch_1.pdf
2. <https://www.statisticssolutions.com/correlation-pearson-kendall-spearman/>
3. <https://statisticsbyjim.com/hypothesis-testing/types-errors-hypothesis-testing/>
4. http://sphweb.bumc.bu.edu/otlt/MPH-Modules/BS/BS704_HypothesisTest-Means-Proportions/BS704_HypothesisTest-Means-Proportions_print.html
5. <http://cba.ualr.edu/smartstat/topics/anova/example.pdf>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Understand and apply the basic concepts of Numerical analysis.
CO 2	Provides basic knowledge in statistics using correlation
CO 3	Develop the skills in logical using sampling methods
CO 4	Understand the different methods applied for different data
CO 5	Exhibit proficiency through demonstrating the statistical methods

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	1	2	1	1
CO2	3	2	2	3	3
CO3	3	2	2	3	3
CO4	3	2	2	3	3
CO5	3	2	1	2	0
AVERAGE	3	1.8	1.8	1.8	2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-LCD)

QUESTION PAPER PATTERN-UG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER II

OBJECT ORIENTED PROGRAMMING USING C++

TOTAL HOURS: 90 Hrs

COURSE CODE: 172703

CREDITS: 4

L-T-P: 4-0-0

COURSE OBJECTIVES:

- 1.To understand the object oriented concepts.
- 2.To learn the basic concepts like Object, Class and bottom-up approach.
3. To understand how to produce object-oriented software using C++
- 4 .To understand and implement the principles like Abstraction, Data Hiding, Dynamic Binding, Polymorphism and Inheritance.
4. To understand features of C++ specifically stream I/O, File I/O.

COURSE OUTLINE

UNIT I

15 Hrs.

Principles of Object Oriented Programming (OOP): Software Evolution – OOP paradigm – Basic concepts of OOP – Benefits of OOP – Object Oriented Languages – Applications of OOP.

UNIT II

15 Hrs.

Introduction to C++: Tokens- Keywords- Identifiers- Variables- Datatypes- Operators-Manipulators- Expressions- Control Structures in C++- Functions in C++ - Main Function – Function prototyping – Parameters Passing in Functions – Values Return by Functions – Inline Functions – Friend and Virtual Functions.

UNIT III

20 Hrs.

Classes and Objects - Constructors and Destructors- Operator Overloading-Type conversions-Function overloading.

UNIT IV

20 Hrs.

Inheritance: Single inheritance – Multilevel inheritance – Multiple inheritance- Hierarchical inheritance – Hybrid inheritance- Virtual Base class- Abstract class-Pointers-Virtual functions and Polymorphism- Managing console I/O Operations.

UNIT V

20 Hrs.

Working with files: Classes for file stream operations – opening and closing file - End of file deduction – File pointers –Sequential input and output operations- Updating a file – Error handling during file operations.

RECOMMENDED TEXTBOOKS:

1. Ananthi Sheshasaayee & Sheshasaayee, C++ Programming, Margham publications, 2006.

2. E. Balaguruswamy, Object Oriented Programming with C++, Sixth Edition, TMH, 2013.

REFERENCE BOOKS:

1. Yashvant Kanetkar, Let us C++, BPB Publishers, 2010.
2. H. Schildt, C++: The complete Reference, Fourth Edition, 2003.
3. Johnston, C++ programming today, PHI, New Delhi, 2002.
4. J.P. Cohoon and J.W. Davidson, C++ Program Design – An Introduction to Programming and Object-oriented Design, 2nd Edition, Tata McGraw-Hill, New Delhi, 1999.
5. A. N. Kanthane, Object Oriented Programming with ANSI & Turbo C++ , Pearson Education, New Delhi, 2005.

JOURNALS:

1. C/C++ Users Journal
2. [Journal of Software Engineering and Applications](#)

E-LEARNING RESOURCES:

1. <https://hackr.io/tutorials/learn-c-plus-plus>
2. <http://www.cplusplus.com>
3. <http://www.informit.com/articles/index.aspxst=60233>

4. <http://www.doc.ic.ac.uk/wjk/C++Intro/>

5. <http://www.fredosaurus.com/notes-cpp/oop-classes/oop.html>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Gain a clear understanding of the basic concepts of C++ along with the applications..
CO 2	Gain knowledge in developing secured object oriented application using functions
CO 3	Acquirement of technical skills to elucidate the overloading mechanism.
CO 4	Apply different types of inheritance to solve the given problems.
CO 5	Analyze file operations in C++ programming.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	3	2	3	2	2
CO 2	3	2	2	3	2
CO 3	3	3	3	3	3
CO 4	3	3	3	3	3
CO 5	3	3	3	2	3
AVERAGE	3	2.6	2.4	2.2	2.4

KEY: STRONGLY CORRELATED-3 MODERATELY CORRELATED-2 WEAKLY CORRELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving

QUESTION PAPER PATTERN-UG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER II

C++ PROGRAMMING – LAB

TOTAL HOURS: 90hrs

COURSE CODE: 172704

CREDITS : 4

L-T-P : 0-0-4

COURSE OBJECTIVES:

1. To develop skills in design and implementation of classes and objects
2. To learn and implement looping structures and functions
3. To learn and implement inheritance concepts.
4. To learn and implement overloading functions
5. To learn and implement file concepts.

LIST OF PROGRAMS

1. Simple program using C++ constructs.
2. Programs Implementing the looping structures
3. Working with control structures.
4. Working with functions
5. Working with inline functions
6. Simple program to create and implementing classes and objects
7. Working with constructors
8. Working with Simple Inheritance
9. Working with multilevel inheritance
10. Working with multiple inheritance
11. Working with virtual functions
12. Working with function overloading
13. Working with function overriding
14. Working with operator overloading
15. Program using pointers
16. Working with abstract class
17. Working with Sequential file input and output operations

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Writing applications using classes and objects
CO 2	Develop applications using functions
CO 3	Writing programs using inheritance.
CO 4	Apply overloading techniques for an application
CO4	Develop applications using files

MAPPING- CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	3	3	2	2	2
CO 2	3	3	2	2	3
CO 3	3	3	3	3	2
CO 4	2	3	3	2	3
CO 5	3	2	3	2	3
Average	2.8	2.8	2.6	2.2	2.6

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

E-LEARNING RESOURCES:

- 1.<https://www.sanfoundry.com>
- 2.<https://www.programiz.com>

SEMESTER II

OPERATIONS RESEARCH

TOTAL HOURS: 90Hrs.

COURSE CODE: 172792

CREDITS:5

L-T-P: 5-0-0

COURSE OBJECTIVES:

- 1.To study and understand the basics of Operations Research and Linear Programming Problem with their methods.
- 2.To understand, analyze and solve the various models in Transportation problem.
- 3.To understand, analyze and solve the various models in Assignment problem.
- 4.To understand, analyze and solve the various models in Sequencing problem.
- 5.To understand, analyze and solve the various models in Networking problem.

COURSE OUTLINE

UNIT I

20 Hrs.

Linear Programming

Operations Research: Classification of Models – Phases – Linear Programming Formulation and Graphical Method: Mathematical Formulation – Graphical Method – Advantages and Limitations of LPP – General LPP: Simplex Method

UNIT II

20 Hrs.

Transportation Model

Definition – Formulation of transportation models – Methods for Initial Basic Feasible Solution: North West Corner Rule, Least Cost Method, Vogel's approximation methods – Transportation Algorithm: MODI Method – Degeneracy – Unbalanced – Maximization case in TP

UNIT III

15 Hrs.

Assignment Model

Definition – Mathematical formulation - comparison with transportation model – Hungarian Method – Unbalanced – Maximization case in AP- Restrictions in Assignment – Travelling Salesman Problem

UNIT IV

15 Hrs.

Sequencing Model

Sequencing problems: Definition - Processing each n jobs on 2 machines – n jobs on 3 machines – n jobs on m machines.

UNIT V

20 Hrs.

Scheduling

Scheduling by PERT and CPM: Introduction – Basic Terminologies – Rules for constructing a project network - Network diagram – Network Computations - CPM – Floats – PERT – Difference between PERT and CPM

RECOMMENDED TEXTBOOKS:

3. Sundaresan. V, Ganapathy Subramanian K S, Ganesan K, “Resource Management Techniques”, A.R. Publications, Fourth Edition, 2009.
4. Kalavathy S, “Operations Research”, VIKAS Publications, Second Edition, 2007.

REFERENCE BOOKS:

6. Anderson, “Quantitative methods for business”, Thomson learning, Eighth edition, 2002.
7. Winston, “Operations research”, Thomson learning, 2003.
8. H. A. Taha, “Operations Research”, PHI, 2002.
9. KantiSwarup , P.K. Gupta , Man Mohan , “ Operations Research “, Sultanchand ,2014.
10. Hamdy. A. Taha, "Operations Research- An Introduction", Pearson publications, Tenth Edition, 2017.

JOURNALS:

1. International Journal of Operational Research
2. Journal of the Operational Research Society

E-LEARNING RESOURCES:

1. <http://www.pondiuni.edu.in/storage/dde/downloads/mbaii qt.pdf>
2. <https://www.slideshare.net/beautifulneha/transportation-problem-in-operational-research>
3. https://www.zeepedia.com/read.php?assignment_problems_solution_of_an_assignment_problem_operations_research&b=66&c=37
4. <http://www.universalteacherpublications.com/univ/ebooks/or/Ch14/intro.htm>
5. <https://www.youtube.com/watch?v=vUMGvpsb8dc>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Formulate and solve Linear Programming Problem in different situations like production, distribution of goods and economics that needs decision.
CO 2	Interpret and apply various transportation methods to solve the issues regarding transfer of goods to obtain the maximum profit.
CO 3	Explore the usage and applications of assignment problem to obtain optimal solution for business decision problems.
CO 4	Determine the effectiveness of solving sequencing problem to synchronize with the latest trends and demands from the industry.
CO 5	Construct network diagrams and implement PERT and CPM methods to plan, schedule and control project activities to meet the needs of corporate sector.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	2	2	3
CO2	2	2	3	2	3
CO3	2	2	3	3	3
CO4	1	1	3	3	3
CO5	2	1	1	1	1
AVERAGE	1.8	1.6	2.4	2.2	2.6

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving

QUESTION PAPER PATTERN-UG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER III

DATA STRUCTURES

TOTAL HOURS: 90Hrs.

COURSE CODE: 172705

CREDITS:4

L-T-P: 4-0-0

COURSE OBJECTIVES:

- 1.To introduce the fundamental concepts of linear and non-linear data structures and emphasize its importance in solving real world problems.
- 2.To formulate new solutions for programming problems and improve existing code using the concepts of various linear and nonlinear data structures.
- 3.To impart skills in developing and implementing efficient data structure algorithm using C++ programming.
- 4.To choose and apply appropriate data structures for a specified application.
- 5.To understand the ADT including List, Stack, Queues.

COURSE OUTLINE

UNIT I 15 Hrs.

Abstract Data Types-Asymptotic Notations-Complexity Analysis-Arrays-Representation of Arrays-Operations on Arrays- Multi-dimensional Arrays- Polynomials- Ordered Lists.

UNIT II 20 Hrs.

Singly Linked Lists-Circular Linked lists-Doubly Linked Lists-Stacks – Representation of Stack - Using Arrays – using Linked List - Queues – Representation of Queue - using Arrays – using Linked List - Circular Queues – Using Arrays - Application of Stack and Queue.

UNIT III 20 Hrs.

Trees – Binary Trees-Binary Tree traversals-Binary tree Representations-Binary Search Trees-Application of Trees - Expression trees – Application of Trees.

UNIT IV 15 Hrs.

Introduction to Graphs - Representation of Graphs –Graph Implementation-Graph Traversals-Application of Traversals-Minimum cost Spanning Tree-Kruskal's Algorithm – Prim's Algorithm - Shortest Path Problems.

UNIT V

20

Hrs.

Hashing – functions – Collision Resolution – open closed - methodology Sorting – Insertion sort – Selection sort – Merge sort – Quick Sort – Heap Sort – Radix Sort - Searching Algorithms – Linear Search – Binary Search.

RECOMMENDED TEXTBOOKS:

1.E.Horowitz, S.Sahni and Mehta- “Fundamentals of Data Structures in C++” -Galgotia-1999, Reprint 2006

2.R. Krishnamoorthy and G. Indirani Kumaravel ,Data Structures Using C, Tata McGraw Hill-2008.

REFERENCE BOOKS:

1.Seymour Lipschutz, Data Structures with C,1st Edition, Schaum’s Outline Series in Computers, Tata McGraw Hill.

2.E. Balagurusamy, Data structures using C, Tata McGraw Hill Reprint,2015.

3.A.K Sharma, Data structures using C,Pearson Education,2013.

4.Gregory L.Heileman,”Data Structures, Algorithms and Object Oriented Programming”,McGraw Hill international Editions ,1996.

5.M. A. Weiss, Data Structures and Algorithm Analysis in C, Pearson Education,2013.

JOURNALS:

1.International Journal of Data Structures

2.International Journal of Science and Research

E-LEARNING RESOURCES:

1.<https://www.hackerearth.com/practice/data-structures/queues/basics-of-queues>

2.<http://www.c4learn.com/data-structure/stack-operations>

3.<https://stacktips.com/tutorials/c/sorting-methods-in-data-structures>

4.<https://www.programiz.com/dsa/linked-list>

5.http://btechsmartclass.com/data_structures/binary-tree-traversals.html

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Discuss various array operations, sorting and searching techniques in formulating new solutions to solve the real world problems.
CO 2	Analyze different types of linked list and its operations to meet the user specified software needs.
CO 3	Demonstrate the application of stack operations, evaluation and conversion of expression in designing software procedures based on changing needs.
CO 4	Asses the ability to design, evaluate queue operations and its implementation in multi domain applications.
CO 5	Exposure to development of problem solving applications utilizing the learned concepts of tree and graph data structures.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	2	2	3
CO3	3	3	3	3	3
CO4	3	2	3	3	3
CO5	3	3	3	2	3
AVERAGE	3	2.8	2.8	2.6	3

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORRELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

QUESTION PAPER PATTERN-UG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER III

DATA STRUCTURES LAB USING C++

TOTAL HOURS: 90Hrs.

COURSE CODE: 172706

CREDITS:4

L-T-P:0-0-4

COURSE OBJECTIVES:

- 1.To design and analyze suitable algorithm for the real world application based on time and space efficiency of the data structure.
2. To design and develop real world application using appropriate data structures using C++.
- 3.To design data structure using Linear data structure. Determine and analyze the complexity of given Algorithms.
- 4.To design data structure using Non-Linear data structure Determine and analyze the complexity of given Algorithms.
- 5.To understand and design the searching and sorting algorithms.

COURSE OUTLINE

List of Programs

1. Program to Implementation basic operations onStack using Arrays
2. Program to Implementation Recursion
3. Program to Implementation basic operations onQueue using Arrays.
4. Program to Implementation basic operations on Circular Queue using Arrays.
5. Program to convert the Infix Expression to Postfix.
6. Program to add Polynomial expression using Arrays.
7. Program to implement insertion and deletion operations on a Linked List
8. Program to Implementation of Stack using Linked list
9. Program to Implementation of Queue using Linked list
10. Program to implement insertion and deletion operations on a Doubly Linked List
11. Program to implement insertion and deletion operations on a Circularly Linked List
12. Program to create a binary tree and traverse the tree using recursion.
13. Program to traverse a graph breadth first search
14. Program to traverse a graph depth first search
15. Program to implement linear search.
16. Program to implement binary search
17. Program to sort the set of data using selection sort
18. Program to sort the set of data using Bubble sort
19. Program to sort the set of data using Quick sort using recursive approach
20. Program to sort the set of data using Merge sort.

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Using the concept of arrays in data structures
CO 2	Evaluate polynomial expression
CO 3	Learn the concept of tree traversal algorithms
CO 4	Learn the concept of graph traversal algorithms
CO 5	Learn the concept of searching and sorting algorithms

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	2	2	3
CO3	3	3	3	3	3
CO4	3	2	3	3	2
CO5	2	3	3	2	3
AVERAGE	2.8	2.8	2.8	2.6	2.8

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Practical session

SEMESTER III

JAVA PROGRAMMING CONCEPTS

TOTAL HOURS: 90Hrs.

COURSE CODE: 172707

CREDITS: 4

L-T-P: 4 -0 - 0

COURSE OBJECTIVES:

1. Understand the concepts of OOP's principles
2. To Understand Java application concepts to develop console applications
3. Learn the applet programming and design GUI based applications

COURSE OUTLINE

UNIT I **15 Hrs.**

Introduction to Java-Features of Java - Object Oriented Concepts - Lexical Issues -Data types - Variable
– Arrays – Operators - Control statements - Looping structures.

UNIT II **15 Hrs.**

Classes-objects-Constructors-Overloading method-Access control- Static and fixed Methods -Inner classes- Inheritance-Overriding methods- abstract class.

UNIT III **20 Hrs.**

Packages-Creating packages - Importing Packages - Interfaces – Creating and using interfaces - String class – String Buffer Class - Exception Handling- Exception Type – Try Block and Catch Block - Throw and Throws – Finally Block – User Defined Exception- Utility Packages.

UNIT IV

20

Hrs.

Concurrent programming - Java Threads – Life Cycle - Thread Synchronization – Messaging - Runnable Interface - Inter Thread Communication – Deadlock – Suspending, Resuming and stopping threads – Multithreading - I/O Streams - File streams- Code Documentation.

UNIT V

20

Hrs.

Applets – Applet Life cycle – Drawing Images – Graphics - AWT and Event handling – Components – AWT controls-Layout Managers - Frames - Menus – Introduction to Swings.

RECOMMENDED TEXT BOOKS:

1. P.Naughton and H.Schildt, “Java 2 The Complete reference”, TMH, Fifth Edition, 2009
2. R.Krishnamoorthy and S. Prabhu –“ Internet and Java Programming”, New Age International Publishers, 2013

REFERENCE BOOKS

1. C. Muthu, “Essentials of Java Programming”, Vijay Nicole, 2009
2. E. Balagurusamy, “Programming with Java”, TMH, Fifth Edition, 2014
3. K.Arnold and J.Gosling, The Java Programming Language, Second Edition.
4. Cay S.Horstmann, Gary Cornell, Core Java 2 Volume I – Fundamentals, Addison Wesley.
5. Deitel and Deitel, “Java – How to program”, Addison Wesley Press

JOURNALS:

1. International journal of Science and Engineering
2. Elsevier journal –Science of Computer Programming

E-LEARNING SOURCES:

1. [https://beginnersbook.com › 2013/12 › java-strings](https://beginnersbook.com/2013/12/java-strings)
2. [https://caveofprogramming.com › java-string-working-with-strings-in-java](https://caveofprogramming.com/java-string-working-with-strings-in-java)
3. [https://www.javatpoint.com › exception-handling-in-java](https://www.javatpoint.com/exception-handling-in-java)
4. [https://www.sitesbay.com › java › java-applet](https://www.sitesbay.com/java/java-applet)
5. <https://www.journaldev.com>

COURSE OUTCOMES

CO No.	CO Statement
CO 1	Write, compile, and execute Java programs that may include basic data types and control flow constructs
CO 2	Learnt the concept of oops principles and its usage
CO 3	To understand importance of Multi-threading & different exception handling mechanisms.
CO 4	To learn the concepts of handling String and StringBuffer functions
CO 5	To learn experience of designing, implementing, testing, and debugging graphical user interfaces in Java using applet and AWT that respond to different user events

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	3	3	1	2
CO 2	3	2	2	3	3
CO 3	3	3	3	3	3
CO 4	3	3	2	3	2
CO 5	3	2	3	2	3
Average	3	2.6	2.6	2.4	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-OHP-LCD)

Problem Solving and Techniques

QUESTION PAPER PATTERN-UG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER III

JAVA PROGRAMMING-LAB

TOTAL HOURS: 90 hrs

COURSE CODE: 172708

CREDITS :4

L-T-P: 0-0-4

COURSE OBJECTIVES:

- 1.To understand the OOPS concept and how to apply in programming.
- 2.To realize and apply the fundamentals core java, Packages, Event Handling for computing.
- 3.To develop Java based Web Application programs.

PRACTICAL LIST

1. Simple program using buffered Reader.
2. Implementing the looping structures
3. Working with control structures.
4. Working with arrays
5. Simple program to create and implement a class
6. Working with Inheritance
7. Working with Overloading
8. Working with Overriding
9. Create and Implement a package
10. Implementing an Interface
11. Working with Exception , Multiple Exception and User defined Exception
12. Creating a thread using Thread class
13. Creating a thread using Runnable Interface
14. Working with Thread Synchronization
15. Implementing with string and string Buffer
16. Working with a I/O package
17. Working with Utility package
18. Simple Applet Programming
19. Simple Event Handling
20. Plotting images
21. Working with Frames
22. Working with Swings

RECOMMENDED TEXT BOOKS:

1. E. Balagurusamy, “Programming with Java”, TMH, Fifth Edition, 2014
2. R.Krishnamoorthy and S. Prabhu –“ Internet and Java Programming”, New Age International Publishers, 2013

REFERENCE BOOKS

1. P.Naughton and H.Schildt, “Java 2 The Complete reference”, TMH, Fifth Edition, 2009
2. C. Muthu, “Essentials of Java Programming”, Vijay Nicole, 2009
3. Deitel and Deitel, “Java – How to program”, Addison Wesley Press
4. Yashavant Kanetkar, “Let Us Java”, BPB Publication, 2017
5. Daniel Liang Y, “ Introduction to Java Programming”, Pearson Publications

JOURNALS:

1. International journal of Science and Engineering
2. Elsevier journal –Science of Computer Programming

E-LEARNING SOURCES:

1. <https://mindmajix.com/control-statements-in-java>
2. <http://www.javatechblog.com/java/method-overloading-and-overriding-in-java-example/>
3. <https://www.geeksforgeeks.org/output-java-program-set-12exception-handling/>
4. <https://www.java-examples.com/applet>
5. <http://www.toves.org/books/java/ch24-swing/index.html>

COURSE OUTCOMES

CO No.	CO Statement
CO 1	Understand Java programs that may include basic data types and control flow constructs
CO 2	Learn the concept of oops principles and implement in real world applications
CO 3	Develop applications using exception, thread concepts
CO 4	Learnt application development using String and StringBuffer functions
CO 5	Able to design, implement, test, and debug graphical user interfaces in Java using applet and AWT that respond to different user events

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	1	3	1	2
CO 2	3	3	2	3	3
CO 3	3	3	3	3	3
CO 4	3	3	2	3	2
CO 5	3	2	3	2	3
Average	3	2.4	2.6	2.4	2.6

KEY:STRONGLY CORELATED-3 MODERATELY CORELATED-2WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture (Chalk and Talk-OHP-LCD)

Problem Solving and Techniques

Practical question paper will be framed by the External Examiner from the practical question bank kept in the Department.

SEMESTER IV
DIGITAL COMPUTER FUNDAMENTALS

TOTAL HOURS: 90 hrs

COURSE CODE: 172709

CREDITS: 5

L-T-P: 4 2 0

COURSE OBJECTIVES:

1. To teach students the theory of digital computer fundamentals, the logic and the implementation of modules required for digital systems.
2. To analyze digital circuits such as combinational logic circuits, clocking and timing circuits
3. To study and analyze the analog-to digital and digital-to-analog devices
4. To learn how the digital fundamentals are implemented in Information technology.
5. To acquire an introduction to Nano Technology

COURSE OUTLINE:

UNIT I

15 Hrs.

Number Systems & Codes: Number System – Base Conversion – Binary Codes – Code Conversion.
Digital Logic Gates – Truth Tables – Universal Gates.

UNIT II

20

Hrs.

Boolean Algebra: Laws & Theorems – SOS, POS methods – Simplification of Boolean Functions –
Using Theorems, K-Map, Prime–Implicant’s Method – Implementation using Universal Gates. Binary

Arithmetic: Binary Addition – Subtraction – Various Representations of Binary Numbers – Arithmetic Building Blocks – Adders – Subtractors.

UNIT III **15**

Hrs.

Combinational Logic: Multiplexers – Demultiplexers – Decoders – Encoders – Code Converters – Parity Generators & Checkers – PLA.

UNIT IV **15**

Hrs.

Sequential Logic: RS, JK, D and T Flip-Flops – Edge-Triggered – Master – Slave Flip-Flops. Registers: Shift Registers – Types of Shift Registers.

UNIT V **20**

Hrs.

Counters: Asynchronous Counters – Ripple, Mod, Up-Down Counters. Synchronous Counters – Ring, Decade, Shift Counters. Memory: Basic Terms & Ideas – Magnetic Memories – Memory Addressing – Types of RAMs – Types of ROMs. Introduction to Nanotechnology – Applications.

RECOMMENDED TEXTBOOKS:

1. Morris Mano, "Digital Logic and Computer Design", PHI, 2001.
2. T.C. Bartee, "Digital Computer Fundamentals", 6th Edition, Tata McGraw Hill, 1991, McGraw Hill, 2002

REFERENCE BOOKS

1. D.P. Leach & A.P. Malvino, "Digital Principles and Application", THM Fifth Edition – 2002
2. M. M. Mano and C.R. Kime, Logic and Computer Design Fundamentals, 2nd Edn, Pearson Education, Delhi. 2001
3. Givone, Digital Principles Design, Tata McGraw Hill, New Delhi. 2002
4. C. H. Roth, Jr, 2005, Fundamentals of Logic Design, 5th Edition, Thomson Learning, Singapore.
5. Manvino & Leach, Digital Principal and Application – TMH, 2011

E-LEARNING RESOURCES

1. <https://www.coursera.org/learn/logic-introduction>
2. <https://www.wiziq.com/tutorials/digital-logic-design>
3. <http://www.understandingnano.com/introduction.html>

4. <http://www.understandingnano.com/nanotech-applications.html>

JOURNALS:

1. Electronics — Open Access Journal
2. Journal of Electrical & Electronic Systems

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Teach students the theory of digital computer fundamentals, the logic and the implementation of modules required for digital systems.
CO 2	Analyze digital circuits such as combinational logic circuits, clocking and timing circuits
CO 3	Study and analyze the analog-to digital and digital-to-analog devices
CO 4	Learn how the digital fundamentals are implemented in Information technology.
CO 5	Acquire an introduction to Nano Technology

MAPPING : COURSE OUTCOME WITH PROGRAM SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	3	2	3	2
CO2	2	3	3	2	1	3
CO3	3	2	3	2	2	2
CO4	2	3	3	2	3	2
CO5	2	3	3	2	3	2

AVERAGE	2.2	2.8	3	2	2.4	2.2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY :

- Lecture (Chalk and Talk)
- Quiz
- Peer Learning

QUESTION PAPER PATTERN-UG

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER IV

DATABASE MANAGEMENT SYSTEMS

TOTAL HOURS:90 hrs

COURSE CODE:172710

CREDITS: 4

L-T-P: 4-0-0

COURSE OBJECTIVES:

To enable students

1. To acquire the basics of databases and relational database management systems concepts.
2. To learn Structured Query language.
3. To design simple database models using Entity-Relationship Model and normalize it.
4. To understand Storage and File structures and the way it is organized.
5. To Understand the Database System Architecture and Distributed Databases

COURSE OUTLINE:

UNIT I

15

Hrs.

Introduction: Database-System Applications- Purpose of Database Systems - View of Data -Database Languages - Relational Databases - Database Design -Data Storage and Querying Transaction Management -Data Mining and Analysis - Database Architecture - Database Users and Administrators - History of Database Systems. Relational Model: Structure of Relational Databases -Database Schema - Keys - Query Languages - Relational Operations Fundamental Relational Algebra Operations - Additional Relational-Algebra Operations- Extended Relational-Algebra Operations - Null Values - Modification of the Database.

UNIT II

15

Hrs.

SQL:Background - Data Definition - Basic Structure of SQL Queries - Additional Basic Operations - Set Operations - Null Values Aggregate Functions - Nested Subqueries - Views - Modification of the Database - Embedded SQL – Dynamic SQL.

UNIT III

20

Hrs.

Database Design and E-R Model: Overview of the design process - The Entity Relationship Model – Constraints: Mapping cardinalities – Entity – Relationship Diagrams - Relational Database Design: Features of Good Relational Designs - Atomic Domains and First Normal Form - Decomposition Using Functional Dependencies - Functional-Dependency- BCNF, Third Normal Form and Fourth Normal form.

UNIT IV

20

Hrs.

Storage and File Structure: Overview of Physical Storage Media – Magnetic Disks: Physical Characteristics of Disks – RAID: Improvement of Reliability Via Redundancy – Improvement in Performance Via Parallelism – Raid Levels – File Organization : Fixed –length records – Variable length records – Organization of records in Files: Sequential file organization – Indexing and hashing: Basic concepts – ordered Indices – B+ Tree Index files: Structure of a B+ tree – B tree index files – Static Hashing : Hash Functions- Handling bucket overflows – hash indices – Dynamic Hashing: data structure.

UNIT V

20

Hrs.

Database System Architectures: Centralized and Client-Server Architecture: Centralized Systems – Client – Server Systems – Distributed Systems: Parallel Databases: Introduction – I/O Parallelism – Partitioning Techniques – Distributed databases: Homogeneous and Heterogeneous Databases – Distributed Data Storage – Data Replication – Data Fragmentation – Transparency.

RECOMMENDED TEXTBOOKS:

1. Data Base System Concepts, Abraham Silberschatz, Henry F.Korth, S.Sundarshan, McGraw-Hill Education, 2013.
2. Database Systems(concepts,Design and Application)S.K.Singh,Pearson Edition, 2009.

REFERENCE BOOKS:

1. Database Management System,Gerald. V.Post III Edition, 2001.

2. Raghu Ramakrishnan, Database Management Systems, WCB/McGraw Hill, 1998.
3. Introduction to Database Management, M.L.Gilenson, Wiley Student Edition, 2012.
4. RamezElmasri, “Database Systems: Models, Languages, Design and Application”, Pearson Education, 2014.
5. Simplified Approach to DBMS, Kalyani Publishers, 10th.edition,2015

JOURNALS:

1. International Journal of Database Management Systems(IJDMS)
2. Journal of Database Management(JDM)

E-LEARNING RESOURCES:

1. <http://www.db-book.com>
2. <http://www.computerweekly.com>tutorial>Database> Normalization
3. <http://www.mysql.com>
4. <https://www.tutorialspoint.com/dbms>
5. <http://www.ddegjust.ac.in/studymaterial/mca-3/ms-11.p>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Develop the terminology, features, classifications, and characteristics of database systems
CO 2	Applying create, populate, maintain, and query statements in the database
CO 3	Developing the normalization theory and apply such knowledge to the normalization of a database
CO 4	Understand Storage and File structures and the way it is organized
CO 5	Understanding the procedures of client server and distributed databases

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	-	-	-
CO2	3	-	2	-	1

CO3	3	1	3	3	-
CO4	3	3	2	1	2
CO5	3	2	2	2	2
AVERAGE	3	1.6	1.8	1	1

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture by Chalk and Talk

QUESTION PAPER PATTERN-UG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER IV

VISUAL PROGRAMMING

TOTAL HOURS: 90Hrs.

COURSE CODE: 172711

CREDITS: 4

L-T-P: 4 -0 - 0

COURSE OBJECTIVES:

1. To understand the basic programming concepts of Visual Basic 6.0 for Windows as an application tool.
2. Learn the fundamentals of designing, implementing, and distributing a Visual Basic application.
3. To gain a basic understanding of database access and management using databound controls.

COURSE OUTLINE

UNIT I 20 **Hrs.**

Customizing a Form - Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button - Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types - String - Numbers.

UNIT II 15 **Hrs.**

Displaying Information - Determinate Loops - Indeterminate Loops - Conditionals - Built-in Functions - Functions and Procedures.

UNIT III 15 **Hrs.**

Lists - Arrays - Sorting and Searching - Records - Control Arrays - Combo Boxes - Grid Control - Projects with Multiple forms - Do Events and Sub Main - Error Trapping.

UNIT IV 20 **Hrs.**

VB Objects - Dialog Boxes - Common Controls - Menus - MDI Forms - Testing, Debugging and Optimization - Working with Graphics.

UNIT V 20 **Hrs.**

Monitoring Mouse activity - File Handling - File System Controls - File System Objects - COM/OLE - automation - DLL Servers - OLE Drag and Drop.

RECOMMENDED TEXTBOOKS:

1. Gary Cornell, “ Visual Basic 6 from the Ground up”, Tata McGraw Hill -1999
2. Dr.A.Murugan, Dr.K.Shyamala, “Visual Basic Programming”, Margham Publications, 2nd Editions, 2012.

REFERENCE BOOKS:

1. Noel Jerke, “ Visual Basic 6, The Complete Reference”, Tata McGraw Hill -1999
2. Byron S Gottfried, “Schaum's Outline of Visual Basic”, McGraw-Hill Education, 2001.
3. Wallace Wang, “Visual Basic 6 For Dummies” ,IDB Books WorldWide,Inc-1998
4. Peter Wright, “ Beginning Visual Basic 6 Objects”, WROX Press Ltd -1998
5. Steven Holzner, “Visual Basic 6 Programming Black Book”, Paraglyph Press -2000

JOURNALS:

1. International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)
2. Information System Education Journals(ISEDJ)

E-LEARNING RESOURCES:

1. <https://docs.microsoft.com/en-us/office/vba/language/reference/user-interface-help/toolbox>
2. <https://www.scribd.com/doc/51767557/Visual-Basic-The-Repetition-Process>
3. <http://www.johnsmiley.com/cis18/Smiley013.pdf>
4. <https://stackoverflow.com/questions/34860913/vb6-common-controls-on-windows-10>
5. <http://zetcode.com/gui/vbwinforms/dragdrop/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Creation of modern IDE programs with GUI intrinsic controls
CO 2	Problem Solving using Looping structure and Functions
CO 3	Implementation of modular, reusable and event driven programs
CO 4	Developing SDI and MDI applications
CO 5	Connecting to database using DAO, ADO and RDO controls

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	1
CO2	2	3	3	3	3

CO3	3	2	2	3	3
CO4	3	3	2	2	2
CO5	3	2	1	2	3
AVERAGE	2.8	2.4	2	2.4	2.4

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving Techniques

Seminar

QUESTION PAPER PATTERN-UG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/7x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER IV

COMPUTER GRAPHICS

TOTAL HOURS: 90 Hrs.

COURSE CODE: 172712

CREDITS: 5

L-T-P: 4-2-0

COURSE OBJECTIVES:

To enable the post graduate students

1. To provide comprehensive introduction about computer graphics system, design algorithms and two dimensional transformations.
2. To make the students familiar with techniques of clipping, three dimensional graphics and three dimensional transformations.
3. The computer graphics course prepares students for activities involving in design, development and testing of modeling, rendering, shading and Animation.

COURSE OUTLINE:

UNIT I

20 Hrs.

A survey of computer graphics – Overview of Graphics Systems: Video display devices: Refresh Cathode Ray tubes, Raster-scan displays, Random-scan displays, Color CRT Monitors, Direct-View Storage tubes, Flat-Panel Displays – Raster scan systems- Random scan systems - Input Devices.

UNIT II

15 Hrs.

Output Primitives: Points and lines - Line Drawing Algorithms: DDA, Bresenham's line drawing algorithm- Attributes of Output Primitives: Line Attributes-Curve Attributes- Color and Grayscale levels – Area Fill Attributes-Character Attributes.

UNIT III

15 Hrs.

Two-dimensional Geometric Transformations: Basic Transformations – Matrix Representations and Homogeneous coordinates – Composite Transformations – Other Transformations – Transformation between coordinate systems. Two-Dimensional Viewing: Viewing Pipeline – Window-to-viewport coordinate transformation – Clipping Operations –Point Clipping – Line Clipping: Cohen-Sutherland line clipping.

UNIT IV

20 Hrs.

Graphical User Interfaces and Interactive Input Methods: The User dialogue - Input of graphical data – Interactive Picture construction techniques. Three-dimensional concepts: Three-Dimensional Display methods – Three-Dimensional Geometric and Modeling Transformations: Translation, Rotation, Scaling, and Other Transformations.

UNIT V

20 Hrs.

Color Models and Color Applications: Properties of light – Intuitive Color Concepts – RGB color model – YIQ color model – Computer Animation: Design of Animation Sequences – Motion Specifications.

RECOMMENDED TEXTBOOKS:

1. Donald Hearn, M.Pauline Baker (2004), “Computer Graphics - C Version” - Second Edition, PHI.
2. Edward Angel, “Interactive Computer Graphics: A Top-Down Approach Using OpenGL”

REFERENCE BOOKS:

4. W.M.Newmann and R.F.Sproull (1979), “Principles of Interactive Computer Graphics”, McGraw Hill.
5. Foley, Van Dam, Feiner, Hughes (2000), “Computer Graphics” - Addison Wesley
6. John F. Hughes Andries Van Dam Morgan Mcguire David F. Sklar James D. Foley Steven K. Feiner Kurt Akeley, “Computer Graphics Principles and Practice”, Third Edition, Addison Wesley.
7. A. P. Godse, “Computer Graphics”, Technical Publications, 2011.
8. V.K.Pachghare, “Computer Graphics”, University Science Press.

JOURNALS:

1. https://www.tutorialspoint.com/computer_graphics/computer_graphics_tutorial.pdf
2. <http://www.dgp.toronto.edu/~hertzman/418notes.pdf>

E-LEARNING RESOURCES:

1. <https://www.coursera.org/courses?query=operating%20system>
2. <https://www.udacity.com/course/introduction-to-operating-systems--ud923#>
3. <https://www.coursera.org/lecture/technical-support-fundamentals/memory-management-CKcxg>
4. <https://www.coursera.org/lecture/technical-support-fundamentals/files-and-file-systems-5n8dt>
5. <https://www.coursera.org/lecture/technical-support-fundamentals/files-and-file-systems-5n8dt>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Have a basic understanding of the core concepts of computer graphics.
CO 2	Be capable of using OpenGL to create interactive computer graphics.
CO 3	General critical analysis, evaluation and synthesis of ideas for the design of the applications on graphics.
CO 4	To comprehend and analyze the fundamentals of animation, virtual reality, underlying technologies, principles, and concepts used in computer graphics.
CO 5	To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.

MAPPING- CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	3	2	2	2	3
CO 2	3	3	2	2	2
CO 3	2	2	3	2	2
CO 4	2	3	3	3	2
CO 5	3	2	2	3	3
Average	2.6	2.4	2.4	2.4	2.4

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving

Seminar

QUESTION PAPER PATTERN-UG

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1. K 2	B-5/7 X 5 marks	200	25		At least one question from each unit

K2, K 3	C-3/5 X 10 marks	500	30		Compulsory One question from each unit

SEMESTER IV

VISUAL PROGRAMMING LAB

TOTAL HOURS: 90Hrs.

COURSE CODE: 172713

CREDITS: 4

L-T-P: 0 -0 - 4

COURSE OBJECTIVES:

1. To Understand the programming concepts of Visual Basic 6.0
2. To develop application programs using VB Tools.
3. To learn window based applications using VB Database Controls.

PRACTICAL LIST

1. Simple application programs
2. Programs using controls
3. Working with variables
4. Programs using Input and Dialog boxes
5. Working with Loops
6. Working with conditional statements
7. Functions and Procedures
8. Searching and sorting using Arrays
9. Working with Common Controls
10. Implementation using Menu Editor
11. Working with MDI forms
12. Working with Lines and Shape controls
13. Graphical programs
14. Mouse Events
15. Keyboard Events
16. Working with Grids
17. File Handling
18. Database programs using DAO control
19. Database programs using RDO control
20. Database programs using ADO control

RECOMMENDED TEXTBOOKS:

1. Dr.A.Murugan, Dr.K.Shyamala, “Visual Basic Programming”, Margham Publications, 2nd Editions, 2012.
2. Soma Das Gupta, “ Visual Basic Projects”, BPB Publications-Reprint 2017

REFERENCE BOOKS:

1. Noel Jerke, “ Visual Basic 6, The Complete Reference”, Tata McGraw Hill -1999
2. Gary Cornell, “ Visual Basic 6 from the Ground up”, Tata McGraw Hill -1999
3. Bruce McKinney, “Hardcore Visual Basic 5.0”, Microsoft Press-1997
4. Steven Holzner, “Visual Basic 6 Programming Black Book”, Paraglyph Press -2000
5. Mohammed Azam, “Programming with Visual Basic 6.0”, Vikas Publication, 2001

JOURNALS:

1. Journals of Information Systems Educations (JISE)
2. Journals of Object Oriented Programming (JOOP)

E-LEARNING RESOURCES:

1. <https://example-code.com/vb6/default.asp>
2. <https://docs.microsoft.com/en-us/dotnet/visual-basic/programming-guide/language-features/procedures/function-procedures>
3. <https://www.freetutes.com/learn-vb6-advanced/lesson5/p2.html>
4. <http://forums.codeguru.com/showthread.php?441166-How-to-use-FlexGrid-Grid-Control-in-VB6>
5. <https://www.developerfusion.com/code/3205/ado-utility-class/>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Application development using VB controls
CO 2	Development of GUI applications based on problem description
CO 3	Advanced knowledge in visual programming to solve real world problem
CO 4	Evaluate programs using error handling techniques
CO 5	Develop Database applications through VB Database Controls

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	2	2	1
CO2	3	3	3	3	3
CO3	3	2	2	3	3
CO4	3	3	2	3	2
CO5	3	2	1	2	3
AVERAGE	3	2.4	2	2.6	2.4

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk ,

Problem Solving Techniques

Practical question paper will be framed by the External Examiner from the practical question bank kept in the Department.

SEMESTER V

OPERATING SYSTEMS

TOTAL HOURS: 90 Hrs

COURSE CODE: 172714

CREDITS:5

L-T-P:5-0-0

COURSE OBJECTIVES:

1. To know the objectives and functions of modern operating systems.
2. To learn about Processes and Scheduling algorithms such as short-term, medium-term, and long-term.
3. To understand the principle of Deadlock.
4. To study computer security issues.
5. To know the features and limitations of operating system to provide protection.

COURSE OUTLINE

UNIT I

15 Hrs.

History of OS: Zeroth – first – Second – Third – Fourth Generations. OS Functions: What is OS – Different Services – User's View – Macro Facility – GUI – The Kernel – Booting. Information Management: File system – Device Driver – Terminal I/O.

UNIT II

20

Hrs.

Process Management: Process – Evolution of Multiprogramming – Context Switching – Process States – Transitions – PCB – Hierarchy – Operations on Process – Multitasking. Inter-Process Communication: Producer-Consumer Problems – Solutions.

UNIT III

20

Hrs.

Deadlocks: Graphical Representation – Pre-requisites – Strategies. Memory Management: Single Contiguous – Fixed Partitioned – Variable Partitioned – Non-Contiguous – Paging – Segmentation – Combined systems – Variable Memory Management.

UNIT IV

20

Hrs.

OS-Security and Protection: Threats – Attacks – Security Violations – Worms – Viruses – Security Design – Authentication – Protection – Encryption – Security in Distributed Environment. GUI and OS: Windowing Technology – GUI – Relationship between Windows and OS – Components of GUI – Requirements of GUI – MS-Windows and Windows-NT.

UNIT V

15

Hrs.

UNIX-Case Study: Overview – File System – Data Structures for Process/Memory Management – Process States and Transitions – Executing and Terminating Program in UNIX – Process Scheduling – Memory Management.

RECOMMENDED TEXTBOOKS:

1.Achyut Godbole, Operating Systems: With Case Studies in UNIX, Netware, Windows NT, Tata-Mcgraw Hill, 2011.

2.Abraham Silberschatz, Peter.B.Galvin, Gerg Gagne, Operating system concepts, 9thEdition, John Wiley & sons, 2015.

REFERENCE BOOKS:

1. Dhananjay M Dhamdhere ,Operating systems A concept based approach, 3rd edition, TATA McGraw HILL, 2012.
2. Mukesh Singhal & Niranjan Shivratri,Advanced concepts in operating systems, 1st Edition, TATA McGraw HILL, 2001.
3. Achyut S.Godbole and Atul Kahate ,Operating Systems, , 3rd edition, TATA McGraw HILL, 2010.
4. Stuart E Madnick and John J Donovan,Operating Systems, TATA McGraw HILL, 2001.
5. H.M.Deitel, An Introduction to operating system, 2nd Edition, Addison Wesley, 1990.

JOURNALS:

1. International journal of Trend in scientific research and development (IJTSRD)–Operating systems a case study.
2. Journal of Information Systems

E-LEARNING RESOURCES:

1. https://www.cs.uic.edu/~jbell/CourseNotes/OperatingSystems/1_Introduction.html
2. https://www.cs.uic.edu/~jbell/CourseNotes/OperatingSystems/7_Deadlocks.html
3. https://www.cs.uic.edu/~jbell/CourseNotes/OperatingSystems/8_MainMemory.html
4. <https://study.com/academy/lesson/page-replacement-definition-algorithms.html>
5. <https://study.com/academy/lesson/preemptive-vs-non-preemptive-process-scheduling.html>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Outline the structure and functionalities of an OS & the concepts of process.
CO 2	Explain different problems related to process synchronization and deadlock.
CO 3	Categorize the concept of paging and segmentation for memory management.
CO 4	Apply different Authentication procedures.
CO 5	Analyze different aspects of Unix.

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	2	2	2
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	2	3	1	3
CO5	3	2	2	2	3

AVERAGE	2.8	2.4	2.4	2.2	2.8

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY:

Lecture - Chalk and Talk

Problem Solving

QUESTION PAPER PATTERN-UG*

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER V

DATA COMMUNICATION AND NETWORKING

TOTAL HOURS : 90

COURSE CODE : 172715

CREDITS : 5

L-T-P : 3 3 0

COURSE OBJECTIVES :

1. To study about the physical arrangement of networks, types of networks, data conversions and transmission medium.
2. To understand the functions and working of different layers of network.
3. To know about the inter-connection and types of devices and network security.

COURSE OUTLINE :

UNIT I

15 Hrs.

Introduction: Data Communication – Networks – Protocols and Standards – Standard Organizations - Basic Concepts: - Line Configurations - Topologies - Transmission Modes- Categories of Networks– Internetworks. The OSI Model: The Model – Functions of the Layers

UNIT II

20

Hrs.

Transmission of Digital Data: Interfaces and Modems: Digital Data Transmission, DTE-DCE Interface – Modems – 56k Modems – Cable Modem. Transmission Media: Guided and Unguided Media, Transmission Impairment, Performance. Multiplexing – Many-to-One/One-to-Many – FDM – WDM – TDM.

UNIT III

20

Hrs.

Error Detection and Correction: Types of Errors – Detection -VRC – LRC – CRC – Checksum - Error Correction. Switching: Circuit Switching – Packet Switching – Message Switching. Networking and Internetworking Devices: – Repeaters – Bridges – Routers – Gateways – Routing Algorithms: Distance vector routing - Link state routing

UNIT IV

15

Hrs.

Transport Layer: Duties – Connection – The OSI Transport Protocol. Upper OSI Layers: Session Layer – Presentation Layer – Applications Layer.

UNIT V

20

Hrs.

TCP/IP Protocol Suite - I: Overview of TCP/IP - Network layer – Addressing – Subnetting - Transport layer. TCP/IP Protocol Suite - II Application layer: Domain Name System – FTP – SMTP – HTTP- WWW.

RECOMMENDED TEXTBOOKS:

1. Behrouz A. Forouzan, “Data Communication and Networking”, TMH, Second Edition, 2003

2. Williams Stallings, “Data and Computer Communication”, PHI, Sixth Edition, 2003

REFERENCE BOOKS :

1. Andrew S.Tannenbaum, Computer Networks, Third Edition, Pearson Professional Education.
2. William Stallings, Data and Computer Communications, Eighth Edition, Pearson Education.
3. Larry Peterson, Bruce Davie, Computer Networks, 5th Edition, Morgan Kaufmann Series
4. Sarika Gupta, Gaurav Gupta, Computer Networks, First Edition, Khanna Book Publishing.
5. Forouzan, Data Communication and Networking, 5th Edition, Tata McGraw Hill

JOURNALS :

1. Journal of Network Communications and Emerging Technology (JNCET)
2. International Journal of Networking and Computing

E-LEARNING RESOURCES :

1. <https://searchnetworking.techtarget.com/definition/OSI>
2. <http://www.cs.virginia.edu/~jorg/teaching/cs457/slides/physical.pdf>
3. <http://www.eecs.umich.edu/courses/eecs373.w05/lecture/errorcode.html>
4. <http://ecomputernotes.com/computernetworkingnotes/routing/routing-algorithms>
5. <https://www.sciencedirect.com/topics/computer-science/transport-layer-protocol>

COURSE OUTCOMES :

CO Number	CO STATEMENT
CO1	Impart knowledge in basics of data networking and the layers of OSI model
CO2	Introduce different types of transmission media to connect the computers in various departments to and concepts of switching used for data communication
CO3	Understand the functions of data link layer to ensure that the data has been transmitted across the layers error free.
CO4	Analyse various routing protocols to determine optimal network data transfer paths between network nodes with good quality of service.
CO5	Build an understanding about functions of transport layer and the concept on how information is transmitted fast and secure across various systems.

MAPPING : COURSE OUTCOME WITH PROGRAM SPECIFIC OUTCOME

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	3	2	3	2
CO2	2	3	3	2	1	3
CO3	3	2	3	2	2	2
CO4	2	3	3	2	3	2
CO5	2	3	3	2	3	2
AVERAGE	2.2	2.8	3	2	2.4	2.2

KEY: STRONGLY CORELATED-3 MODERATELY CORELATED-2 WEAKLY CORELATED-1
NO CORELATION-0

TEACHING METHODOLOGY :

- Lecture (Chalk and Talk)
- Quiz
- Peer Learning

QUESTION PAPER PATTERN-UG

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER V
SOFTWARE ENGINEERING AND TESTING

TOTAL HOURS: 90hrs

COURSE CODE: 172716

CREDITS: 5

L-T-P: 5 0 0

COURSE OBJECTIVES:

To enable the students

1. To acquaint the basic concepts of structure and planning in software engineering
2. To Understand the Software Engineering Practice & Process Models.
3. To Understand Design Engineering, Testing and Software Maintenance.

COURSE OUTLINE:

UNIT I

20 Hrs.

Introduction of Software Engineering: Definitions – Size Factors – Quality And Productivity Factors – Managerial Issues – Planning A Software Project: Defining the Problem – Developing a Solution Strategy – Planning the Development Process – Planning an Organization Structure – Other Planning Activities.

UNIT II **20**

Hrs.

Software Cost Estimation – Software Cost Factors – Software Cost Estimation Techniques – Staffing Level Estimation – Estimating Software Maintenance Costs – The Software Requirements Specifications – Formal Specification Techniques – Languages and Processors For Requirements Specification.

UNIT III **20**

Hrs.

Software Design: Fundamental Design Concepts – Modules And Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real-Time And Distributed System Design – Test Plans – Milestones, Walkthroughs And Inspections.

UNIT IV **20**

Hrs.

Implementation Issues: Structured Coding Techniques – Coding Style – Standards And Guidelines – Documentation Guidelines – Verification and Validation Techniques - Quality Assurance – Walkthroughs and Inspections – Unit testing and Debugging – System Testing – Integration Testing and Acceptance Testing.

UNIT V **10**

Hrs.

Software Maintenance- Enhancing Maintainability during development –Managerial aspects of software maintenance – Configuration Management – Other maintenance tools and techniques.

RECOMMENDED TEXTBOOKS:

1. Richard Fairley –Software Engineering concepts- Tata McGraw Hill Publication, Edition 1997,Reprint 2007.
2. R.S.Pressman, “Software Engineering – A Practioner’s Approach”, Tata McGraw Hill, 6thEdition, 2001

REFERENCE BOOKS:

1. Ian Sommerville, “Software Engineering”,Addison Wesley, 9th Edition, 2001.
2. Rajib Mal, “Fundamental of Software Engineering”, 2nd Edition, PHI, New Delhi, 2005.
3. ElayWhitesman, “Software Engineering – Concepts and Principles”, McGraw Hill – 2009.

4. Software Engineering :A Cocise study by Kelkar S.A, Prentice hall India learning Private Limited,(2007).
5. Software Engineering: Concepts and Application by Subhajitdatta ,OUP India (2010).

JOURNALS:

1. International Journal of Computer and Software Engineering.
2. Indian Journal of Computer science and Engineering.

E-LEARNING RESOURCES:

6. <http://www.researchgate.net/>
7. https://www.tutorialspoint.com/software_engineering/case_tools_overview.htm
8. <http://www.literateprogramming.com/sdtypes.pdf>
9. <http://www.softwaretestinghelp.cpm/web-application-testing>
10. <http://softwareengineeringdaily.com>

COURSE OUTCOMES:

CO Number	CO STATEMENT
CO 1	Able to prepare good software requirements and planning for development.
CO 2	Able to produce software estimation cost of the design meant for the business using techniques.
CO 3	Able to design a model and representation of a new system.
CO 4	Able to guide the implementation tasks, including detailed design, coding, integration and Testing.
CO 5	Able to know the Software Maintenance with defects finding approach and configuration

MAPPING-COURSE OUTCOME WITH PROGRAMME SPECIFIC OUTCOME

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	3	-	3	3	3
CO2	3	2	2	3	2	3
CO3	3	3	-	3	3	3
CO4	3	3	2	3	3	3
CO5	2	3	2	2	3	3
AVERAGE	2.8	2.8	1.2	2.8	2.8	3

Key: Strongly Correlated-3, Moderately Correlated-2, Weakly Correlated-1, No Correlation-0

TEACHING METHODOLOGY :

- Lecture (Chalk and Talk)
- Quiz
- Peer Learning

QUESTION PAPER PATTERN-UG

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER V
WEB TECHNOLOGY

TOTAL HOURS: 90 hrs**COURSE CODE: 172717****CREDITS : 5****L-T-P : 4-0-2**

COURSE OBJECTIVES:

- 1.To be familiar with client server architecture and able to develop a web application using web technologies.
- 2.To learn how to create web pages by using HTML, java script and DHTML.
- 3.To gain the skills and project-based experience needed for entry into web application and development careers.

COURSE OUTLINE:**UNIT I****15hrs**

Internet Basics - Introduction to HTML – Lists: Types of Lists - Adding Graphics to HTML Documents: Border Attribute, Width and Height Attribute, Align Attribute, ALT Attribute

UNIT II**20hrs**

Tables: Introduction, Width and Border Attribute, Cellpadding Attribute, Cellspacing Attribute, Background-color Property, Colspan and Rowspan Attribute, Linking Documents: Links, Images as Hyperlinks, Frames

UNIT III**20hrs**

Introduction to Javascript: Javascript in Webpages-Advantages-Writing Javascript into HTML – Basic Programming Techniques – Operators and Expressions – Programming Constructs – Functions – User Defined Functions - Dialog Boxes

UNIT IV**20hrs**

Javascript Document Object Model: Introduction – JSSS DOM – Understanding Objects in HTML – Browser Objects –Object Hierarchy – Handling Events. Forms: FORM Object – Other built-in Objects in Javascript – User Defined Objects - Cookies

UNIT V**15hrs**

Dynamic HTML: Cascading Style Sheets – Use of Class - tags – External Style Sheets - <DIV> tag

RECOMMENDED TEXT BOOKS

1. Ivan Bayross, “Web Enabled Commercial Application Development using HTML, JavaScript, DHTML and PHP”, BPB Publications, 4th Revised Edition, 2009.

2. Thomas A. Powell, "The Complete Reference – HTML & XHTML", Tata McGraw-Hill Edition, Fourth Edition, 2003.

REFERENCE BOOKS

1. James Jaworski, "Mastering Javascript and Jscript", BPB Publications, First Indian Edition – 1999
2. Dietel, Dietel & Nietc, Internet and World Wide Web – How to program, Pearson Education Publishers, Fourth Edition, 2013
3. J. Jaworski, Mastering JavaScript, BPB, 2011
4. T.A. Powell, Complete Reference HTML, TMH Publications, 2010
5. R. Krishnamoorthy, S.Prabhu, "Internet and Java Programming", New Age International Publishers, 2004.

JOURNALS:

1. <http://www.rroij.com>
2. <https://www.journals.elsevier.com/science-of-computer-programming>

E-LEARNING RESOURCES:

1. <http://www.htmlandcssbook.com>
2. <http://www.learnerstv.com/video/Free-video-Lecture-15138-Computer-Science.htm>
3. http://www.beginnertuts.com/Tutorials/Javascript/javascript_beginner_video_tutorials.php
4. <https://www.edx.org/learn/html>
5. <https://www.w3schools.com/html/>

COURSE OUTCOMES:

CO No.	CO Statements
CO 1	Build Web pages using HTML
CO 2	Apply various attributes to web pages
CO 3	Validate the forms using JavaScript
CO 4	Apply styles to web pages
CO 5	Apply their computer science skills to the create a website with some understanding of the legal, security, commercial, marketing and other issues involved.

MAPPING- CO with PSO

CO / PSO	PSO 1	PSO 2	PSO 3	PSO4	PSO5
CO 1	2	2	2	2	2
CO 2	3	3	2	2	2
CO 3	3	2	3	2	2
CO 4	3	3	3	3	3
CO 5	3	2	2	2	3
Average	2.8	2.4	2.4	2.2	2.4

Key: Strongly Corelated-3, Moderately Corelated-2, Weakly Corelated-1, No Corelation-0

TEACHING METHODOLOGY :

- Lecture (Chalk and Talk)
- Quiz
- Peer Learning

QUESTION PAPER PATTERN-UG

Knowledge Level	Section	Word Limit	Marks	Total	Special Instructions if any
K 1	A-10X2 marks	50	20	75	Two questions from each Unit
K1, K 2	B-5/8x5 marks	200	25		Atleast one question from each unit
K2, K 3	C-3/5x10 marks	500	30		Compulsory One question from each unit

SEMESTER V

MINI PROJECT

TOTAL HOURS : 90 Hrs

COURSE CODE : 172718

CREDITS : 4

L-T-PS : 0-0-4

Students have to develop a Mini Project in their area of interest using latest technology and tools.

**QUAID-E-MILLATH GOVERNMENT COLLEGE
FOR WOMEN (AUTONOMOUS)**

CHENNAI-600002

DEPARTMENT OF COMMERCE

M.COM SYLLABUS



CHOICE BASED CREDIT SYSTEM OUTCOME BASED EDUCATION (OFFERED FROM THE ACADEMIC YEAR 2017-18)

CONTENTS

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RULES AND REGULATIONS FOR THE PROGRAMME

CHOICE BASED CREDIT SYSTEM

Quaid - E –Millath Government College for Women (Autonomous) offers the Semester System of education with credits for UG courses. Credit simply means the weightage given to what is taught and what is learnt. It is normally related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures/tutorials/laboratorywork/seminar/project work/practical training/viva voce etc, to facilitate effective teaching and learning and the credits are assigned accordingly, depending on the content and the specialization.

The minimum credit requirement for a two-year PG course shall be 100 (90 for Core and Elective & 10 credits for Soft Skills papers & Internship).

REGULATIONS

1. Duration

- a. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semester, the second academic year, the third and fourth semester.
- b. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year.

Course of Study

- a. The course of study for Post Graduate Degree Courses shall comprise Core courses and Electives.

b. System of Credits:

Year	No of Papers				Marks	Credits				
	Core	Elective	Extra Disciplinary Elective	Soft Skill		Core	Elective	Extra Disciplinary Elective	Soft Skill	Internship
I	7	3	1	2	1300	28	9	3	4	2
II	8	2	1	2	1300	32	6	3	4	-
Total	15	5	2	4	2600	60	15	6	8	2

Passing Minimum

A candidate shall be declared to have passed in each paper/practical of the Main subject of study where prescribed if she secures NOT LESS THAN 50% marks prescribed for the examination. She shall be declared to have passed the whole examination, if she passes in all papers and practical wherever prescribed, as per the scheme of examinations, earning 90 credits.

Eligibility for Award of Degree

Candidates must secure a minimum of 50% of marks in the End Semester Examinations. A candidate must secure 8 credits in soft skills and 2 credits in internship in addition to 90 credits from Core and Elective courses to obtain a Post Graduate Degree.

Ranking

Candidates who pass all the examinations prescribed for the course in the **FIRST APPEARANCE ALONE** are eligible for Classification/Ranking/Distinction.

PROGRAMME OUTCOMES

On completion of the Programme the learner will be able to:

1. Apply quality skills in all modules
2. Identify the essence of subject knowledge
3. Demonstrate entrepreneurial, creative and communication skills
4. Acquire thorough knowledge of the subject
5. Analyse the fundamental research

PROGRAMME SPECIFIC OUTCOMES

On completion of M.Com, the student will be able to:

PSO 1	Pursue professional courses like CA, ACS, CMA, MBA, Law etc.
PSO 2	Acquire managerial and entrepreneurial skills to venture into own business
PSO 3	Develop skills relevant to the field of marketing
PSO 4	Acquire the relevant knowledge to take up competitive exams such as UGC JRF/NET/SET to take up teaching/research
PSO 5	Secure a career as a tax/security/financial analyst.

PROGRAMME PROFILE

SE M	PAR T	COURS E CODE	TITLE OF THE PAPER	CREDIT S	HOURS/W K	TOTA L HOUR S	CA	SE	TOTA L
I	III	17710 1	Labour Legislation	4	6		25	75	100
	III	17710 2	International Trade and Practice	4	6		25	75	100
	III	17710 3	Modern Business Environment	4	6		25	75	100
	III	17710 4	Financial Markets	4	6		25	75	100
	III	17710 5	Organisational Behaviour & HRD	3	4		25	75	100
	IV		Soft Skill	2	2		40	60	100
II	III	17710 6	Advanced Corporate Accounting	4	6		25	75	100
	III	17710 7	Marketing management	4	6		25	75	100
	III	17710 8	Company Law & Secretarial Practice	4	6		25	75	100
	III	17710 9	Customer Relationship Management	3	5		25	75	100
	III	17711 0	Business Ethics, Corporate Governance & Social Responsibility	3	5		25	75	100
	IV		Soft Skill	2	2		40	60	100
III	III	17710 1	Applied Costing and Accounting for Management	4	5		25	75	100
	III	17710 1	Financial Management	4	5		25	75	100
	III	17710 1	Total Quality Management	4	5		25	75	100

SE M	PAR T	COURS E CODE	TITLE OF THE PAPER	CREDIT S	HOURS/W K	TOTA L HOUR S	CA	SE	TOTA L
	III	17710 1	Strategic Management	4	5		25	75	100
	III	17710 1	Income Tax Law & Practice	3	5		25	75	100
	IV	17710 1	Consumer Rights and Responsibiliti es	3	3		25	75	100
	IV	17710 1	Soft Skill	2	2		40	60	100
IV	III	17710 1	Business Research Methodology	4	6		25	75	100
	III	17710 1	Corporate Laws	4	6		25	75	100
	III	17710 1	Project Work	8	4		160 (Pro)	40 (Viva)	200
	III	17710 1	Income Tax Law, Practice & Tax Planning	3	6		25	75	100
	III	17710 1	E- Commerce	3	6		25	75	100
	IV		Soft skill	2	2		40	60	100

EVALUATION PATTERN FOR CONTINUOUS ASSESSMENT

INTERNAL VALUATION BY COURSE TEACHER/S

PART III- ACCOUNTANCY & THEORY PAPERS

S.NO	COMPONENT	HOURS	MAX.MARKS	CA MARK
1	CA TEST I	1	25 (To be converted)	20*
2	CA TEST II	1	25 (To be converted)	20*
3	CA TEST II	1	25 (To be converted)	20*
3	Assignment/Seminar			25
4	Model Examination	3	75 (To be converted)	25
5	Attendance			10
	TOTAL			100 (To be converted to 25)

- Highest of two CA tests will be selected for internals

PART IV-SKB/SOFT SKILLS

COMPONENT	HOURS	MAX MARKS
Presentation skills		20
Test	1	10
Assignment		10

CA QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A – 5 x 2 marks	50	10	

K1, K2	B – 1/2 x 5 marks	200	5	25
K2, K3	C – 1/2 x 10 marks	500	10	

CA QUESTION PAPER PATTERN FOR PART IV

Knowledge Level	Section	Word Limit	Marks	Total
K 1, K2	A – 2 x 5 marks	200	10	10

RUBRICS FOR CONTINUOUS ASSESSMENT

Assignment Content/originality/Presentation/Schematic Representation and Diagram/Bibliography

Seminar Organisation/Subject Knowledge/Visual Aids/Confidence level/presentation-Communication and Language

Field Visit	Participation/Preparation/Attitude/Leadership
Participation	Answering Questions/Clearing Doubts/Participating in Group Discussions/Regular Attendance
Case Study	Finding the Problem/Analysis /Solution/Justification
Problem Solving	Understanding Concepts/Formula and Variable Identification/Logical Sequence/Answer
Group Discussion	Preparation/Situation Analysis/Relationship Management/Information Exchange/Delivery Skills

EVALUATION PATTERN FOR END SEMESTER ACCOUNTANCY & THEORY PAPERS

PART III (offered by the Department)

SEMESTER I/II/III/IV/V/VI

SINGLE VALUATION BY EXTERNAL EXAMINER

MAXIMUM MARKS: 75 MARKS (EXTERNAL)

PASSING MARK: 30

PART IV

SINGLE VALUATION BY INTERNAL EXAMINER

WRITTEN TEST

MAXIMUM MARKS: 60

PASSING MARK: 24

PART III

PROJECT WORK

SEMESTER VI

VALUATION BY EXTERNAL EXAMINER

MAXIMUM MARKS: 200 (Project 160, Viva 40)

PASSING MARKS: 100

COURSE PROFILE SEMESTER – I

Core I - Labour Legislation

Total Hours: 90

Course Code: 177101

Credits: 4

Course Objectives:

- To comprehend the health, safety and welfare measures under Factories Act, 1948.
- To bring about an understanding on workmen's compensation.
- To enlighten the essential provisions of Payment of Wages Act, 1936.
- To impart understanding on settlement of industrial disputes.
- To provide an in-depth knowledge about Standing Orders and Procedures.

Unit I

The Factories Act, 1948: Definition – Health, Safety and Welfare Measures – Working Hours of Adult – Holidays – Employment of Women and Young Persons – Annual Leave with Wages.

16 Hours

Unit II

The Workmen's Compensation Act, 1923; Definition – Rules regarding Workmen Compensation – Employer's Liability for Compensation – Occupational Diseases.

12 Hours

Unit III

Payment of Wages Act, 1936: Definitions – Rules for Payment of Wages – Deductions from Wages – Maintenance of Registers and Records – Inspectors – Appeals – Penalties

16 Hours

Unit IV

Industrial Disputes Act, 1947: Definitions – Arbitration and Settlement of Industrial Disputes – Voluntary Reference of Disputes - Authorities under the Act - Strikes and Lock Outs – Lay Off and Retrenchment .

23 Hours

Unit V

Industrial Employment (Standing Orders) Act, 1946 : Definition – Schedule – Matters to be provided in the Standing Orders – Procedure for Submission of the Standing Orders – Certification of the Standing Orders – Appeal – Payment of Subsistence Allowance – Penalties

23 Hours

Recommended Text Books:

1. N.D. Kapoor, Handbook of Industrial Law. Sultan Chand & Sons
2. S.C. Srivastava, Industrial Relations and Labour Laws, Vikas Publications

Reference Books:

1. H.Samuel, Industrial Law, Vikas Publications
2. Malhotra, The Law of Industrial Disputes, Vikas Publications
3. Srivastava, The Industrial Employment Standing Orders Act, Vikas Publications
4. Dr. V. Kubendran, Industrial Relations and Labour Laws, Himalaya Publications
5. Bray, Industrial Relations and Labour Laws, McGraw Hill

Learning Outcome:

- To understand the organisational set up comprising labour issues
- To acquire the knowledge about compensation available to labour
- To get an insight regarding the rules for payment of wages
- To accustom with the methods of solving disputes
- To acquaint with the orders and penalties pertaining to the employment act

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	1

CO2	3	3	1	1	2
CO3	3	3	1	1	2
CO4	3	3	1	2	1
CO5	3	2	1	1	2
Average	3	2	1	1.2	1.6

SEMESTER I
Core II – International Trade and Practice

Total Hours: 90

Course Code: 177102

Credits: 4

Course Objectives:

- To enable understanding of basic theories pertaining to International Trade .
- To familiarize the students with various tariffs, subsidies and import quotas available in international trade .
- To provide insight into modes of entry into international business and licensing procedures
- To impart understanding about various international organizations.
- To identify various financial aids available for international trade.

Unit I

International Business – Definition – Nature – Approaches and Theories of International Business (Adam & Ricardo) – Problems of International business – International Economic Environment – Business, Social, Cultural, Technological, Economic and Political Environment

16 Hours

Unit II

International Trade Policies and Relations – Tariffs – Subsidies – Import Quota – Voluntary Export Restraints – Administrative Policies – Multinational Corporations – Definition – Factor Contributing to Growth of Multinationals – Criticism of Multinationals

18 Hours

Unit III

Modes of International Business – Exporting – licensing – Franchising Contracts – Contracts of Manufacturing – Management Contracts – Turnkey Projects – Mergers, Acquisitions and

Joint Ventures – Market Entry Strategies – International Marketing Channels – Export Policies – Export Import Procedure.

18 Hours

Unit IV

World Trade Organization and Trade Blocks – Economic Integrations – Free Trade Area – Custom Unions – Common Markers – European Union – EEC, ASEAN, SAARC, SAFTA – Liberalization of Trade.

18 Hours

Unit V

International Finance – Introduction – Foreign Exchange – Types of Foreign Exchange Rates – Convertibility of Rupees and its Implications – Direct Foreign Investment – Reason of Direct Foreign Investment – Strategies of Direct Foreign Investment – International Institutions and their Role in Capital Market – I.M.F. and World Bank.

20 Hours

Recommended Text Books:

1. Subba Rao, International Business, Himalaya Publishing House
2. International Trade Finance, Indian Institute of Banking and Finance

Reference Books:

1. Roger Bennett, International Business, Pitman Publishing
2. Justing Paul, International Business, Prentice Hall of India
3. Ajami, International Business, Theory and Practice, Prentice Hall of India
4. Krugman P, Obstfeld M, Melitz M, International Trade – Theory and Policy, Pearson Publications
5. Vij N, International Trade Law – Universal Law Publishing

Course Outcome:

Students gain knowledge about

- Theories and problems in international trade
- International trade, policies and tariffs
- Modes of conducting international business
- World Trade Organisation, Trade Blocks and European Union
- Functions of IMF, WTO and World Bank

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	3	1	1
CO2	1	3	3	1	1
CO3	1	3	3	1	1
CO4	1	3	3	1	1
CO5	1	3	3	1	1
Average	1	3	3	1	1

SEMESTER I

Core III – Modern Business Environment

Total Hours: 90

Course Code: 177103

Credits: 4

Course Objectives:

- To create an awareness about the environment encompassing business
- To provide an insight into political environment
- To impart understanding about the social and cultural aspects of the environment
- To enumerate the economic environment surrounding the business
- To study the impact of globalisation on business

Unit I

Business Environment – Concept – Nature – Significance – Types of Business Environment: Internal and External – Elements of External Environment – Concept of Business – Characteristics – Scope – Interrelationship between Industry, Commerce and Trade

Hours 18

Unit II

Political Environment: Preamble of the Indian Constitution, Characteristics, Directive principle of State Policy – Fundamental Rights and Duties, Economic Roles of Government- Government and Regulatory Environment - Legal Environment – Competition Act, Foreign Exchange Management Act, Patents and Trade Marks Act, Environment Protection Act

Hours 18

Unit III

Social Environment: Population Control Policy, Migration and Ethnic Aspects – Human Development - Cultural Environment: Concept, Nature and Elements of Culture, Impact of Culture on Business and India's Socio-Cultural Environment

Hours

18

Unit IV

Economic Environment: Meaning, Meaning, Characteristics of Economic System, Basic Units, Types - Capitalism, Socialism and Mixed Economy, Features, Merits and Demerits - – New Economic Policy – New Industrial Policy: National Manufacturing Policy and National Manufacturing Competitiveness Council (NMCC) - Monetary Policy - Fiscal Policy – Foreign Trade Policy

Hours

18

Unit V

Global Environment: Nature and Characteristics, Modern Globalisation – Measurement of Poverty – Impact of Globalisation – Anti-Globalisation – Pro Globalisation – International Economic Institutions: Meaning – Objectives – UNICAD – GSP **Hours**
18

Recommended Text Books:

1. Francis Cherunilam, Business Environment, Himalaya Publishing House
2. C.B. Gupta, Business Environment, Sultan Chand & Sons

Reference Books:

1. Hill, International Business, Tata McGraw Hill Publications
2. M. Meier, International Environment of Business, Oxford University Press
3. Aswathappa.K, Essentials of Business Management, Himalaya Publishing House
4. Vernon A. Musselman, Introduction to Modern Business, Prentice Hall of India
5. Dr.S. Shankaran, Business Environment, Margham Publications

Course Outcome:

- To understand the relationship of business to its environment
- To have an in depth idea regarding the environment encompassing the business
- To understand the influence of social environment on the business
- To make students understand the scenario of various economic system, fiscal and monetary policy affecting the business
- To develop an understanding regarding globalisation

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	3	2
CO2	3	3	1	3	2
CO3	3	3	1	3	2
CO4	3	3	1	3	2
CO5	3	3	1	3	2
Average	3	3	1	3	2

SEMESTER I

Core IV – Financial Markets

Total Hours: 90

Course Code: 177104

Credits: 4

Course Objective:

- To provide insight on financial market structure .
- To educate the students about capital markets and instruments
- To intensify understanding of money market operations
- To familiarize the students with the functioning of derivative markets
- To bring about an understanding of global market financial instruments

Unit I

Organisational Structure of Financial System – Functions of Financial Market – Profile of Financial Market – Financial Market and Economic Growth – SEBI Act 1992 – Powers and Functions of SEBI.

12 hours

Unit II

Indian Capital Markets – Capital Market Instruments – Stock Exchange – National Stock Exchange – Listing – Prospectus – New Issue Markets – Book Building – Insider Trading Investor Protection.

19 hours

Unit III

Money Market – Importance – Functions – Developed Money Market – Call Money Market – Certificate of Deposits – Treasury Bill Market – Government Securities Market.

20 hours

Unit IV

Derivative Markets – Types of contracts – Trading System – Regulation Of Derivative Markets– Derivative in India – Recent trends - Government Securities Market: Types of instruments traded – Characteristics of Government Securities Market – Recent Trends.

20 hours

Unit V

Instruments Issued Outside India - FCCBS, GDRS, ADRS, ECBS, Etc. – Their Characteristics, Advantages and Disadvantages, Procedure for Issue of Various Instruments

and their Cost – Recent Trends in Capital Market.

19 hours

Recommended Text Books:

1. S Gurusamy, Financial Services, Vijay Nicole Imprints Private Limited
2. Khan.M.Y. Indian Financial System, 2010, Tata McGraw Hill Education Pvt. Ltd

Reference Books

1. Gordon & Natarajan, Financial Markets and Services, 2011, Himalaya Publishing House
2. Machi Raja.H.R, Indian Financial System, Vikas Publishing House Pvt Ltd.
3. Pramod Rao, Preeti Phuskala, Indian Financial System, Emerging Trends, The ICAI University.
4. B.Santhanam, Financial markets and services, Margham Publication Pvt.ltd.
5. Dr.L Natarajan.Investment Management, Margham Publication Pvt.ltd.

Course Outcome:

Student gains knowledge about

- Basics of financial system
- Indian Capital market instrument process
- Importance of money market & government securities market
- Regulation of derivatives market.
- Procedure for issue of various instruments and their costs

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	1
CO2	3	3	1	1	1
CO3	3	3	1	3	1
CO4	3	3	1	3	1
CO5	3	3	3	1	3
Average	3	3	3	3	3

SEMESTER I

Elective I - Organisational Behaviour and Human Resource Development

Total Hours: 60

Course Code: 177105

Credits: 3

Course Objectives:

- To impart understanding of individual behavior in the Organisation
- To understand the effects of group dynamics and group behavior
- To develop an insight on the aspect of human resource development
- To comprehend the importance of career planning and employee empowerment
- To familiarize the students with the various methods of performance appraisal

Module-I

Meaning, Nature and Scope of Organizational Behaviour, Models of Organizational Behaviour, Difference between Organizational Behaviour and Individual Behaviour – Personality, Motivation Learning – Perception – Leadership – Power and Politics

Hours 13

Module-II

Group Dynamics – Group Behavior, Group Decision Making – Intergroup Relations - Organizational Change and Development – Organizational Culture and Climate – Organizational Conflict

Hours 12

Module-III

Human Resource Development – Meaning - Concept – Objectives – Principles – Employee Counseling – Emotional Quotient – Learning and HRD – Theories of Learning, Implications of Learning Theories for effective HRD Programs – Employee Training – Concept – Need – Importance – Methods of Training – Executive Development :Concept, Objectives, Methods.

Hours 10

Module-IV

Career Planning and Development: Meaning, Objectives, Process - Employee Empowerment: Concept, Elements, Importance, Barriers to Empowerment

Hours 12

Module-V

Performance Appraisal: Concept, Objectives, Importance, Process, Methods - Job Evaluation: Concept, Objectives, Process, Essentials of Job Evaluation

Hours 13

Learning Outcome

- Understand the importance of organisational behaviour

- Increase the ability to work as a team
- Improves the skills in handling organization conflicts.
- Provides vision about the career development
- Imparts understanding of various methods of performance appraisal

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	3	2	1
CO2	3	1	3	1	1
CO3	3	1	3	2	1
CO4	3	1	3	1	1
CO5	3	1	3	1	1
Average	3	1	3	1.4	1

COURSE PROFILE SEMESTER – II

Core V - Advanced Corporate Accounting

Total Hours: 90

Course Code: 177106

Credits: 4

Course Objectives:

- To impart understanding on International Accounting Standards
- To familiarize with the preparation of financial reports
- To comprehend the accounting procedure relating to amalgamation
- To enable the students to prepare consolidated Balance Sheet of Holding Companies
- To study the accounting treatment of price level changes

Unit I

Accounting Standards – Meaning – Objectives – Importance – International Accounting Standards – Accounting Standards in India – AS 1,2,6,10,14,20,25,28 & 29.

12 hours

Unit II

Financial Reporting for Financial Institutions – Meaning – Types of Institutions – Provisions relating to Mutual Fund, Merchant Bankers and Stock Brokers.

19 hours

Unit III

Amalgamation – Meaning and Nature of Amalgamation, Methods of Accounting for Amalgamation – Computation of Purchase Consideration – Accounting Treatment for Amalgamation – Inter Company Owings.

20 hours

Unit IV

Accounting of Holding Companies – Meaning – Definition of Holding & Subsidiary Companies – Preparation of Consolidated Balance Sheet.

20 hours

Unit V

Accounting for Price Level Changes – Meaning – Methods – CPP, CCA and Hybrid Method – Merits & Demerits.

19 hours

Ratio between Problem and Theory 80:20

Recommended Text Books:

1. N Maheshwari, Corporate Accounting , Sultan Chand Publication
- T. S Reddy & Murthy, Corporate Accounting, Margham Publication

Reference Books:

1. Shukla M C and T. S. Grewal, Advanced Accounts, S. Chand and Co.
2. Gupta R L and M. Radhaswamy, Advanced Accounts, Sultan Chand
3. Jain S P and K.L. Narang, Advanced Accounts, Kalyani Publishers

Course Outcome:

Student gains knowledge about

- Basics of accounting standards
- Financial reporting for financial institution
- Accounting treatment for amalgamation
- Preparation of consolidated balance sheet
- Methods of accounting for price level changes

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	1
CO2	3	3	1	1	1
CO3	3	3	1	3	1
CO4	3	3	1	3	1
CO5	3	3	3	1	3
Average	3	3	1.4	1.8	1.4

SEMESTER II

Core VI - Marketing Management

Total Hours: 90

Course Code: 177107

Credits: 4

Course Objectives:

- To provide an insight into the basic marketing concepts
- To understand consumer behavior and their importance
- To impart understanding of various promotional techniques
- To study the importance of green marketing and network marketing
- To highlight the importance of social marketing as a strategy

Unit I

Introduction to Marketing Management – Nature and Scope – Concepts of Marketing – Functions and Problems of Marketing Management – Traditional Marketing – Modern Marketing – Responsibilities of Marketing Manager – Role of Marketing Management in Indian Economy.

12 hours

Unit II

Buyer Behaviour – Consumer Behaviour Vs Business Buying Behaviour – Factors affecting Consumer Behaviour – Consumer Research – Importance – Consumer Research Process – Consumer Research Design – Steps in Consumer Research.

12 hours

Unit III

Promotion – Communication Process – Characteristics of Promotion- Merits – Demerits – Designing a Promotion Campaign – Promotion Mix – Advertising Management: Types, Benefits, Advertising Agencies - Personal Selling: Meaning, Objectives, Qualities – Sales Force Management – Sales Promotion: Objectives, Importance and Methods

12 hours

Unit IV

Marketing Organization and Control – Emerging Trends and Issues in Marketing – Rural Marketing – E- Marketing, Nature, Scope, Growth, Benefits, Drawbacks – Green Marketing: Meaning, Importance, Principles and Adoption – Network Marketing.

12 hours

Unit V

Social Marketing: Evolution, Types – Marketing Mix: Social Impact of Marketing – Social Regulations in Marketing – Business Regulations in Marketing – Social Marketing Communication – Planning Cycle for creating Communication

12 hours

Recommended Text Books:

1. R.S.N. Pillai and Bagavathi, Modern Marketing, Principles and Practices, Sultan Chand & Sons
2. Kotler P, Armstrong G, Agnihotri P, Principles of Marketing, Pearson Publications

Reference Books:

1. V.S. Ramasamy and Namakumari, Marketing Management, Global Perspective McMillan Publishers
2. Kotler P, Marketing Management, Pearson Publications
3. Naresh K Malhotra, Marketing Research-An Applied Orientation, Pearson Publications
4. Wirtz J, Lovelock C, Chatterjee J, Services Marketing, Pearson Publications
5. Rajan Nair, Marketing, Sultan Chand Publishers

Course Outcome:

Student gains knowledge about

- Basics of marketing management, roles and responsibilities of a marketing manager
- Consumer behaviour, factors affecting it and consumer research process

- Promotion mix and advertising techniques
- Emerging market trends such as green marketing, rural marketing and e-marketing
- Dynamics of market place to be a successful business man with an eye on sustainability

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	3	1	1
CO2	1	3	3	2	1
CO3	1	3	3	1	1
CO4	1	3	3	1	1
CO5	1	3	3	1	1
Average	1	3	3	1.2	1

SEMESTER II

Core VII – Company Law and Secretarial Practice

Total Hours: 90

Course Code: 177108

Credits: 4

Course objectives:

- To facilitate understanding of the new concepts and amendments in the Companies Act, 2013
- To enable students to understand the legal formalities for incorporation of a company
- To bring about an understanding on various types of share capital
- To comprehend the role of Directors in company management
- To familiarize the provisions relating to secretarial duties as regards meetings and resolutions

Unit I

Evolution of Company law – Meaning and Characteristics of a Company – New concepts in modern company law - Comparative analysis and benefits of different business models – Illegal Association – Lifting of Corporate Veil - Role and importance of Company Secretary – Key Managerial personnel – Compliance Officer – Compulsory appointment – Qualification and Disqualification – Powers, Duties and Responsibilities of a Secretary – Resignation and Removal of Company Secretary – Officer in default. **18 hours**

Unit II

Incorporation of a Company – Documents to be filed - Memorandum and Articles of Association – Contents — Commencement of Business – Alteration of Memorandum and Articles of Association - Doctrine of Constructive Notice – Ultra Vires and Indoor Management – Duties of Company Secretary in the Formation of the Company. Prospectus- Contents-Role of Secretary in the issue of Prospectus. **18 hours**

Unit III

Share capital – Meaning, Bonus Issue, Private and Preferential Allotment – Rules and Regulations Relating to the Issue of Capital – Role of Company Secretary in the Issue of Capital – Dematerialization and Re-materialization of securities – Reduction of share capital and the Procedure thereof. **18 hours**

Unit – IV

Company Management – Directors - Kinds of Directors – Requirements of a Women Director and Importance of Independent Director – Director identification number and its significance – Qualification and Disqualification – Retirement – Resignation – Removal and Vacation of Office of Directors – Duties of Directors – Code of Conduct – Key Managerial Personnel – Whole Time Key Managerial Personnel – Appointment and Remuneration **18 hours**

Unit –V

Board Meetings -- Committee Meeting – Mandatory Committees and its importance – Role and Composition – Powers of the Board and Video Conference – Notice, Agenda and Minutes – Shareholders Meeting – Kinds of Meeting and the compliance of legal requirements – Electronic voting – Postal Ballot – Role of Company Secretary- Rules relating to General Meeting – Kinds of Resolution – Ordinary and Special Resolution - Role of Company Secretary **18 hours**

Recommended Text Books:

1. Company Law and Secretarial Practice - N.D. Kapoor, Sultan Chand Publications
2. P.K.Ghosh, Company Secretarial Practice, S.Chand Publication

Reference Books:

1. Dr. B. Ravi – Company Law and Secretarial Practice (New Companies Act 2013)
2. Taxman's Companies Act, 2013, Taxman Publication
3. Vinod Kothari, Understanding Companies Act 2013, Jain Book Agencies
4. Gaffoor, Company Law, Vijay Nichole Imprints
5. Alan J. Dignam, John P. Lowry, Company Law, Oxford University

Course Outcome:

- To give an insight knowledge about business models and lifting of corporate veil
- To understand the procedures regarding incorporation of the company and filing of documents
- To make them aware of the ways of raising share capital
- To provide the skills needed for company management with the understanding of its procedure
- To familiarize with the procedures regarding the board meeting

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	2	1
CO2	3	2	1	2	1
CO3	3	2	1	2	1
CO4	3	2	1	2	1
CO5	3	2	1	2	1
Average	3	2	1	2	1

SEMESTER II**Elective II - Customer Relationship Management****Total Hours: 75****Course Code: 177109****Credits: 3****Course objectives:**

- To enable the students to understand the basic components of customer relationship management
- To familiarize the students with the concept and conduct of customer survey
- To impart understanding on procedures involved in dealing with complaints from customers
- To bring about an understanding of implementation of technology in customer relationship management
- To provide knowledge about customer data warehouse and data mining

Unit I

Customer Relationship Management – Meaning – Need for CRM – Objectives – Components of CRM – CRM selection and Implementation Process **15 hours**

Unit II

Customer Relationship Survey Design – Analysis of Customer Surveys – Using Customer Relationship Survey Results – Customer Loyalty – Customer Retention **15 hours**

Unit III

Complaint Management – Meaning – Benefits of Resolving Complaints – Classification – Complaint Management System – Traps in Complaint Handling System

15 hours

Unit IV

Call Centre – Objectives – Features – Architecture – Technological Components – Planning – Computer Technology Integration (CTI) – Benefits – Functions - Cross Selling and Up Selling

15 hours

Unit V

Integrated CRM with Data Warehouse – Data Mining – Process –Banking and Tele Communication – Additional Techniques for Relationship Management Applications – Sales force Automation

15 hours

Recommended Text Books:

1. Shanmugasundaram. S, Customer Relationship Management, Prentice Hall of India

Reference Books:

1. Peeru Mohamed.H, & Sahadevan.A, Customer Relationship Management, Vikas Publishing House Pvt Ltd
2. Sugandhi R.K, Customer Relationship Management, New Age International Publishers
3. Anderson Customer Relationship Management, Tata McGraw Hill Education
4. John Anton, Customer Relationship Management, Prentice Hall

Course Outcome:

- To give them understanding about the Customer Relationship Management
- To make them aware of the survey design, results of Customer Relationship Management and the customer loyalty
- To understand the procedure of complaint management
- To provide them knowledge regarding technological components in CRM
- To make them aware of the automation in the field of data mining regarding the customer and sales force

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	1
CO2	3	3	3	2	1
CO3	3	3	3	2	1
CO4	3	3	3	2	1

CO5	3	3	3	2	1
Average	3	3	3	2	1

SEMESTER II

Elective II – Extra Disciplinary Paper-I Business Ethics, Corporate Governance and Social Responsibility

Total Hours: 75

Course Code: 177110

Credits: 3

Course Objectives:

- To familiarize the students with the concept of Business Ethics
- To impart understanding on information disclosures
- To bring about an understanding on the principle of corporate social responsibility
- To highlight the importance of corporate governance
- To enumerate the contents of the Birla Committee Report

Unit I

Concept of Ethics - Sources - Values - Codes of Conduct - What is an Ethical Issue? - Ethical Theories in Relation to Business/Morality – Utilitarian, Kant, Normative, Stockholder and Stakeholder Theories – Ethical Management - Strengthening Personal and Organisational Integrity - The Spiritual Core of Leadership

15

hours

Unit II

Advertising and Information Disclosures - Environmental Responsibility - Ethics and Ecology - Employee Rights - Conflict of Interests - Work Ethics - Professional Ethics and Responsibility

15

hours

Unit III

Corporate Social Responsibility - Meaning - Promoting Corporate Responsiveness - Managing Socially Responsible Business

15

hours

Unit IV

Corporate Governance – Meaning and Scope – Origin - Practices – Shareholders Vs Stakeholders Approach – Board Mechanism, Role and Duties of the Directors – Chairman - Governance Committees

15

hours

Unit V

Codes of Governance – Birla Committee Report

15

hours

Recommended Text Books:

1. A M A, Corporate Governance And Business Ethics, Excel Books
2. H. Peeru Mohammed, A. Sahadevan, Customer Relationship Management, Vikas Publications

Reference Books:

1. Cannon Tom, Corporate Responsibility. A textbook on Business Ethics, Governance, Environment: Role and Responsibilities, Pitman
2. Hoffman, W. Michael, Corporate Governance and Institutionalizing Ethics, Lexington Books
3. Sekhar R C, Ethical Choices in Business, Response Books
4. R.K. Suganthi, Customer Relationship Management, New Age Publications
5. Singh, Retail Management, S.Chand & Co Publications

Course Outcome:

- To have a broad idea regarding the ethical theories
- To create awareness on advertisements and its ethics
- To make the students knowledgeable regarding corporate social responsibility of the business
- To give a wider knowledg regarding the corporate governance
- To have a vivid understanding of Birla Committee report

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	1
CO2	3	3	2	2	1
CO3	3	3	2	2	1
CO4	3	3	2	2	1
CO5	3	3	1	2	1
Average	3	3	1.8	2	1

COURSE PROFILE SEMESTER – III

Core VIII – Applied Costing and Accounting for Management

Total Hours: 75

Course Code: 177111

Credits: 4

Course objectives:

- To provide an insight into Analysis & interpretation of financial statements
- To impart understanding of marginal costing as a tool in Decision making
- To understand the concept of budgeting , budgetary control and preparation of budgets
- To facilitate preparation of process accounts
- To comprehend the techniques of contract costing

Unit I

Analysis of Financial Statements – Ratios indicating Profitability – Liquidity, Solvency & efficiency
15 hours

Unit II

Marginal Costing For Decision Making – Make or Buy – Key Factor – Pricing – Shut Down of plant – Optimal product mix – Adding or Discontinuing of a Product
15 hours

Unit III

Budgeting And Budgetary Control - Meaning – Definition – Importance – Classification of Budget – Preparation of Sales Budget - Production Budget - Cash Budget – Flexible Budget – Zero Base Budgeting
15 hours

Unit IV

Meaning - Features of Process Costing – Elements of Production Cost – Normal and Abnormal Gain/ Loss – Inter Process Profits – Equivalent Production – Procedure for Evaluation.

**15
hours**

Unit V

Contract Costing – Introduction – Characteristics Features of Contracts and Contract Costing – Distinction between Job Costing and Contract Costing – System of Contract Costing – Recording of Costs of a Contract – Recording of Value and Profit on Contracts – Estimated Profit - Profit or Loss on Contracts

**15
hours**

Ratio between Problems and Theory is 80:20

Recommended Book:

1. T.S. Reddy and Y. Hariprasad Reddy, Cost Accounting, Margham Publications
2. S.P. Jain and K.L. Narang, Cost Accounting, Kalyani Publishers

Reference Books:

1. M. N. Arora, Cost and Management Accounting, Vikas publicationns
2. Dr. S.N. Maheshwari, Principles of Cost Accounting, Sultan Chand & Sons
3. R.S.N. Pillai and V. Bagavathi, Cost Accounting, S.Chand
4. S.P. Iyengar, Cost and Management Accounting, Sultanchand & Sons
5. P.T. PattanChetty, D.R. Palekar, Cost Accounting, R. Chand & Co.

Course Outcome:

- To understand the financial statement analysis using ratios
- Helpful for the students to understand the decision making using marginal costing
- To learn the procedures in preparation of budgtets
- To understand the preparation of process account, cost apportionment and allotment
- To learn the methods of costing under contract and job costing

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	1	2
CO2	3	3	2	1	2
CO3	3	3	2	1	2
CO4	3	3	2	1	2
CO5	3	3	2	1	2
Average	3	3	2	1	2

SEMESTER III
Core IX – Financial Management

Total Hours: 75

Course Code: 177112

Credits: 4

Course Objectives:

- To enable the students to understand the concepts of financial management
- To help students to evaluate investment proposals using capital budgeting
- To understand the significance and calculation of cost of capital
- To familiarize the students with the types of capital structure theories
- To enable the students to determine working capital requirement of industries

Unit I

Financial Management – Meaning – Nature and Scope of Finance – Financial Goal – Profit Vs Wealth Maximization – Finance Functions – Investment – Financing – Dividend Decisions

15 hours

Unit II

Capital Budgeting – Nature of Investment Decisions – Investment Evaluation Criteria – Net Present Value – Internal Rate of Return – Profitability Index – Payback Period – Accounting Rate Of Return – NPV and IRR Comparison – Capital Rationing – Risk Analysis In Capital Budgeting

15 hours

Unit III

Cost of capital – Meaning – Significance of Cost of Capital- Calculation of Cost of Debt – Preference Capital – Equity Capital – Retained Earnings – Combined Cost of Capital (Weighted) - Cost of Equity – CAPM

15 hours

Unit IV

Capital Structure Theories – Traditional and M.M Hypotheses – Without Taxes and With Taxes – Determining Capital Structure in Practice- Operating and Financial Leverages – Measurement of Leverages – Effects of Operating and Financial Leverage on Profit – Analysis of Alternate Financial Plans – Combined Financial and Operating Leverage

15 hours

Unit V

Management of Working Capital – Meaning – Significance – Types of Working Capital – Calculating Operating Cycle Period – Estimation of Working Capital Requirements – Management of Cash – Receivables and Inventory – Dividend Policies – Issues in Dividend Decisions – Walter's Model – Gordon's Model – MM Hypothesis – Forms of Dividend

15 hours

Ratio between Problems and Theory is 40:60

Recommended Books:

1. Maheswari S.N. Financial Management: Principles and Practice, Sultan Chand and Sons
2. P. Periyaswamy, Financial Management, Vijay Nichole Imprints

Reference Books:

1. Pandey, I.M. , Financial Management, Vikas Publishing house
2. Khan MY, Jain PK, Financial Management; Tata McGraw Hill
3. Srinivasa, Financial Management and Policy, Himalaya Publications
4. Dr. P.C. Tulsian, Financial Management for CA, IPCC, S.Chand
5. Dr. A. Murthy, Financial Management, Margham Publications

Course Outcome:

- To have basic knowledge of finance from the perspective of business
- To understand the importance of capital budgeting and risk analysis
- To have deeper understanding about various types of cost of capital
- To study the theories regarding capital structure and to determine the capital structure and its leverage
- To manage the working capital and its components

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	3
CO2	3	2	1	1	3
CO3	3	2	1	1	3
CO4	3	2	1	1	3
CO5	3	3	1	1	3
Average	3	2.2	1	1	3

SEMESTER III

Core X - Total Quality Management

Total Hours: 75

Course Code: 177113

Credits: 4

Course Objectives:

- To provide an insight into the dimensions of quality control

- To bring about an understanding on the techniques of quality control
- To enable them to understand the concept of sampling inspection
- To familiarize the students with recent techniques of quality improvement
- To delve into various ISO models and their certification

Unit-I

Introduction to Quality Control - Quality and Cost Considerations - Statistics and its Applications in Quality Control.

15 hours

Unit -II

Sampling Inspection in Engineering Manufacture - Statistical Quality Control by the Use of Control Charts - Methods of Inspection and Quality Appraisal - Reliability Engineering – Value Engineering and Value Analysis

**15
hours**

Unit -III

Theory of Sampling Inspection - Standard Tolerance – ABC Analysis - Defect Diagnosis and Prevention.

15 hours

Unit -IV

Recent Technique for Quality Improvement - Zero Defect - A Quality Motivation Techniques- Quality Management System and Total Quality Control

15 hours

Unit -V

Selection of ISO Model and Implementation of ISO 9000. Human Resource Development and Quality Circles - Environmental Management System and Total Quality Control

15 hours

Recommended Books:

1. Srinivasa Gupta and Valarmathy, Total Quality Management, Vijay Nicole Imprints
2. Sharma, Total Quality Management, International Book House

Reference Books:

1. Dahlgaard Jens J, Kristensen K, Kanji Gopal K, Fundamentals of Total Quality Management, Bross Chapman & Hall
2. George, Stephen and Weimerskirch, Arnold, Total Quality Management - Strategies and Techniques Proven, Mohit Publications
3. Hakes, Chris, Total Quality Management: The Key to Business Success, NY: Chapman and Hall

4. Fox, Roy, Making Quality Happen. Six Steps to Total Quality Management, McGraw-Hill
5. S. Senthilkumaran, Total Quality Management, Veda Publications

Course Outcome

- Enables the students with the basic principles and methods of total quality Management.
- Improves students practical knowledge towards modern techniques and tools used in production process.
- Enhance the students in the practical application of Sampling Inspection.
- Develop thinking towards quality system.
- Provide exposure in Selection of ISO Model and Implementation of ISO 9000.

Course Mapping

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	1	2
CO2	3	3	3	2	2
CO3	3	3	3	1	2
CO4	3	3	3	1	2
CO5	3	3	3	1	2
Average	3	3	3	1.2	2

SEMESTER III

Core XI – Strategic Management

Total Hours: 75
Credits: 4

Course Code: 177114

Course Objective:

- To impart understanding on the concept of strategic management
- To enable students to understand and formulate business strategy
- To help the students to identify and formulate various alternative strategies
- To familiarize students with strategy implementation
- To enable students to evaluate implemented strategies

Unit I

Strategic Management - Concept of Strategy - Strategic Management Process - Making the Management Theory to Work. **15**

hours

Unit II

Strategy Formulation - Mission, Business Definition, Objectives - Environmental Appraisal - Organisation Appraisal - Porter's Model – SWOT- Core Competence, Experience curve.

15 hours

Unit III

Strategic Alternatives - Growth, Diversification, Merger, Disinvestment Strategies – Strategic Choice - BCG Analysis, Competitor Analysis. **15hours**

Unit IV

Strategy Implementation - Activating Strategies, Organisation Structure, Functional Plans and Policies, Corporate Culture. **15**

hours

Unit V

Strategy Evaluation - Technique of Strategic Evaluation and Control.

15 hours

Recommended Books:

1. Ramaswamy V.S. and S. Namakumari; Strategic Planning: Formulation of Corporate Strategy, Macmillan Publishers
2. S.P.Singh, Strategic Management, AITBS Publishers

Reference Books:

1. Kazmi, Azhar; Business Policy, Tata McGraw Hill Publishing Co
2. Johnson, Gary and Scholes, Kelvan; Exploring Corporate Strategy, Prentice Hall of India
3. Banerjee, Bani P.; Corporate Strategies, Oxford University Press
4. Certo, Samuel C and Paul J. Peter; Strategic Management: A focus on process, McGraw Hill, New York, 1990.
5. Kevin Lane Keller, Strategic Brand Management, Prentice Hall Pearson

Course Outcome:

Student gains knowledge about

- Strategic management concept & process

- Strategic formulation objectives & mission
- Strategic alternatives growth and diversification
- Strategic implementation policies and corporate culture
- Dynamics & techniques of strategy evaluation & control

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	1	1
CO2	3	3	3	2	1
CO3	3	3	3	1	1
CO4	3	3	3	1	1
CO5	3	3	3	1	1
Average	3	3	3	1.2	1

SEMESTER III

Elective III – Income Tax Law and Practice

Total Hours: 75

Course Code: 177115

Credits: 3

Course Objectives:

- To impart understanding of basic taxation concepts
- To help the students to compute salary income
- To make them determine income from house property
- To comprehend calculation of business and professional income
- To enable understanding of capital asset concept and their calculation

Unit:-I

Tax Meaning – Objectives of Taxation – Basic Concepts of Taxation – Kinds of Taxes – Definition of important terms – Income – Assessment – Assessee – Person – Assessment Year – Previous Year – Residential Status of an Individual, HUF, Firm and Company **15 hours**

Unit:-II

Salaries – Allowances – Perquisites – Profit in lieu of Salary – Provident Fund – Gratuity – Pension- Leave salary – Deduction from Salary **15**
hours

Unit:-III

Annual value of House property – Computation under Different Circumstances – Deduction from Annual value. **15**
hours

Unit:-IV

Profits and Gains of Business or profession – Computation – Allowable and Disallowable Expenses – General Deduction. **15**
hours

Unit:-V

Capital Gains – Meaning of Capital Assets - Kinds of Capital Assets – Kinds of Capital Gains – Computation of Capital Gains – Exemption under Section 54. **15**
hours

Ratio between Problem and Theory 80:20

Recommended Text Book

1. T.S. Reddy and Y. Hariprasad Reddy, Income Tax Law and Practice, Margham Publication
2. Gaur & Narang Income Tax, Kalyani Publication

Reference Books

1. Gaur & Narang Income Tax, Kalyani Publication
2. Vinod Singhania, Students Guide to Income Tax and Central Taxes, Taxman Publications
3. Mehrotra & Goyal, Income Tax Law & Accounts, Sathiya Bhavan Publications.
4. Dhinkar Pagare, Income Tax Law and Practice, Sultan Chand Publications
5. C.A. Raj K. Agarwal, Handbook on Income Tax, Bharath Publication

Course Outcome:

- Student gains knowledge about
 - Basic concepts of taxation
 - Salary deductions & allowances
 - Computation of house property under different circumstances
 - Facilitates computation of Capital Gain

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	3
CO2	3	2	1	1	3
CO3	3	2	1	1	3
CO4	3	1	1	1	3
CO5	3	1	1	1	3
Average	3	1.6	1	1	3

SEMESTER III
Extra Disciplinary Paper – II

Consumer Rights and Responsibilities

Total Hours: 45**Course Code: 177116****Credits: 3****Course Objectives:**

- To impart understanding on basic consumer rights
- To familiarize with the provisions relating to right to information
- To enumerate the provisions relating to maintaining standards and certification of products
- To highlight the importance of consumer responsibilities
- To enumerate the procedures relating to handling consumer complaints

Unit I

Consumer – Definition – Consumer rights – Right to Safety – Measures of Safety – Safety Standards.

9 Hours

Unit II

Right to Information – Sources of Information – Labels – Pre-packed goods and Unfair trade practices – Declaration to be made on the labels – Advertising – Deceptive and Misleading Advertisements – Role of ASCI.

9 Hours

Unit III

Right to Choose – Restrictive Trade Practices – Food Adulteration – Food Contamination – Tests for Detection – Product Standards – Bureau of Indian Standards (BIS) – Certification Marks.

9

Hours

Unit IV

Consumer Responsibilities – Critical Awareness Action – Social Concern – Environmental Concern – Working Together.

9 Hours

Unit V

Consumer Complaints – Platforms for Consumer representation – Consumer Disputes Redressal.

9 Hours

Recommended Text Book:

1. Handbook for Citizen Consumer Clubs, Published by Department of Civil Supplies and Consumer Protection, Government of Tamilnadu
2. Saharay H K, Text book on Consumer Protection Law, Universal Law Publishing

Reference Books:

1. Avatar Singh, Law of Consumer Protection, Eastern Book Company
2. Commentary on the Consumer Protection, Universal Law Publication
3. Balakrishna Eradi, Consumer Protection – Jurisprudence, Lexis Nexis Butter Worth Publishing
4. Mohammed Kamalun Nabi, Mohammed Irshadun Nabi, Consumer Rights and Protection in India, New Century Publications
5. Paul M C, Consumer Redressal System and Consumer Protection in India, Kalpaz Publications

Website:

www.consumer.tn.gov.in

Course Outcome:

- Gives awareness about the rights of a consumer
- Gives knowledge about sources of product information and to distinguish between genuine and misleading advertisements
- Creates awareness about food adulteration and certification marks on products
- Creates an understanding on consumer responsibilities
- Encourages students to seek legal redressal for product/service defects

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	3	1	1
CO2	3	1	3	1	1
CO3	3	3	3	1	1
CO4	3	1	3	1	1
CO5	3	1	3	1	1
Average	3	1.4	3	1	1

COURSE PROFILE SEMESTER – IV**Core XII - Business Research Methodology****Total Hours: 90****Course Code: 177117****Credits: 4****Course Objective:**

- To highlight the importance of business research
- To enable the students to identify research problem
- To teach various data collection techniques
- To familiarize the students with various data analytical tools
- To facilitate the students to prepare research reports

Unit -I

Meaning and Definition of Social Research – Objectives of Research – Motivation to Research - Approaches to Research- Research Process – Criteria of good Research – Maintaining objectivity in Research – problems encountered by Researchers – Major Areas and Scope for Research in Business Management.

18 Hours**Unit -II**

Problems formulation – Identifying a Research Problems – Sources of Research problem – Techniques involved in defining a Research Problem – Research Designing – Exploratory - Survey – Descriptive – Experimental – Case study Design – Factors affecting a Research Design.

18**Hours**

Unit -III

Elements, Variables, Observation, Scales of Measurement – Qualitative and Quantitative - Cross- Sectoral and Time Series – Sources - Methods of Data collection – Documents and Observation – Questionnaire and Interview – Guidelines for constructing Questionnaire and Interview Schedule – Scaling Methods – Response Errors – Hypothesis – Hypothesis formulation and Hypothesis Testing.

18

Hours

Unit -IV

Descriptive Statistics – Factor Analysis – Reliability Test – Parametric Analysis – t-test – Anova – Correlation – Regression (Linear) – Non-parametric Analysis – Chi Square.

18

Hours

Unit -V

Report Writing – Kinds of Research Reports – Steps in Report Writing – Layout of Research Report – Mechanics in writing a Research Report – Precautions in writing a Research Report.

18

Hours

Ratio between Theory and Problems is 80:20

Recommended Books:

1. C. R Kothari, Research Methodology Methods & Techniques, New Age International Publishers
2. Dr. P. Ravilochanan, Research Methodology, Margham Publications

Reference Books:

1. Saravanavel .P, Research Methodology, Margham Publisher
2. R. Prabhu, Research Methodology in Business Management, Vijay Nichole Imprints
3. Martyn Denscombe, The Good Research Guide for Small Scale Research Projects, Viva Books Pvt Ltd
4. Thanulingan, Research Methodology, New Himalaya Publications
5. Ratan Khasnabis, Suvasis Saha, University Press

Course outcome:

- Students appreciate and understand the role of research in business decisions.
- Students get knowledge in creation of research design
- Students have adequate knowledge on measurement & scaling techniques
- Have basic awareness of data analysis and hypothesis testing procedures.
- Comprehend mechanics of writing a Research Report

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	3	3	1
CO2	3	1	3	3	1
CO3	3	3	3	3	1
CO4	3	1	3	3	1
CO5	3	1	3	3	1
Average	3	3	3	3	1

SEMESTER IV
Core XIII - Corporate Laws

Total Hours: 90
Credits: 4

Course Code: 177117

Course Objective:

- To impart understanding on the rules and regulations of SEBI
- To equip the students with the methods of handling business competition
- To facilitate understanding of Intellectual Property Rights in business context
- To create an awareness on the need to protect environment
- To educate the students about the rights and responsibilities of consumers

Unit I

SEBI Act 1992 – SEBI Regulations – Corporate Governance Clause 49 A – Transparency and Disclosure.

18

Hours

Unit II

Competition Act 2002 – Objectives of the Act – Competition Commission of India – Duties, Powers and Functions of the Commission - Execution of Orders of the Commission – FEMA – Important Provisions.

18

Hours

Unit III

Information Technology Act 2000 – Intellectual Property Rights – Patent Act – Copyright – Trademarks and Merchandise Act.

18

Hours

Unit IV

Environment Protection Act 1986 – Definition of Important Terms – Powers of the Central Government to Prevent and Control Environmental Pollution – Important Provisions of the Act pertaining to the Prevention and Control of Environmental Pollution.

18

Hours

Unit V

Consumer Protection Act 1986 – Objects of the Act – Definition of Important Terms – The Central Consumer Protection Council – State Consumer Protection Councils – Consumer Disputes Redressal Agencies.

18

Hours

Text Book:

1. N. D. Kapoor, Corporate Laws and Secretarial Practice , Sultan Chand Publications
2. Dr. Harish Kumar, Corporate Social Responsibility, AITBS

Reference Books:

1. Taxman, Corporate Laws, Sultan Chand Publications
2. G. K. Kapoor, Corporate Laws and Secretarial Practice , Sultan Chand Publications
3. Sankaran, Foreign Exchange and Financing Foreign Trade, Margham Publications
4. Prof. Mustafa, Business Environment and Law, AITBS Publications
5. H.R. Machi Raju, Corporate Governance Himalaya Publications

Course Outcome:

- To promote an insight about SEBI and its regulations
- To have a deeper knowledge regarding competition Act, Competition Commission of India and the role of FEMA
- To have a vivid understanding about IPR practices
- To have the awareness regarding environment and its suitability
- To have the understanding regarding the ways of consumer protection and their redressal forums

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	3	1	2
CO2	3	3	3	1	2
CO3	3	1	3	1	2
CO4	3	1	3	1	2
CO5	3	3	3	1	2
Average	3	3	3	1	2

Semester IV

Elective IV – Income Tax Law, Practice and Tax Planning

Total Hours: 90

Course Code: 177120

Credits: 3

Course Objectives:

- To enable the students to compute Income from Other Sources
- To educate the students regarding Assessment of Individuals
- To familiarize the procedure relating to filing of returns
- To impart understanding on computation of Partnership income
- To educate the students on tax planning, concepts and methods

Unit - I

Income from other sources – Computation – Deduction and other relevant provisions- Set off and carry forward of losses – Clubbing of Income

18

hours

Unit - II

Assessment of Individuals – Deduction allowable from gross total income (80C, 80CCC, 80CCD, 80CCD1B, 80CCE, 80CCG, 80D, 80DD, 80DDB, 80E, 80G, 80GG, 80GGA, 80GGB, 80GGC, 80QQB, 80RRB, 80TTA and 80U)-Computation of Tax liability.

18

hours

Unit – III

Procedure for Assessment–Filing of Return – Voluntary Return-Revised Return – Defective Return – Self assessment – Summary assessment – Scrutiny assessment – Best Judgement Assessment - Deduction of Tax at source – Advance Payment of Tax – Permanent Account Number – CBDT – Powers and Duties (theory only)

18

hours

Unit - IV

Firm: Meaning of Partnership – Kinds of Partnership Firm for Tax Purpose – Assessment as a Firm – Computation of Total Income of a Firm – Computation of Income of a Partner from the Firm.

18

hours

Unit - V :

Tax Planning – Meaning – Nature – Scope – Difference between Tax Planning and Management – Tax Evasion and Tax Avoidance – Tax Planning and Management in Corporate Sector – Justification of Tax Planning and Management

18

hours

Ratio between Problem and Theory 60:40**Recommended Text Book**

1. T.S. Reddy and Y. Hariprasad Reddy, Income Tax Law and Practice, Margham Publication
2. Gaur & Narang Income Tax, Kalyani Publication

Reference Books

1. Gaur & Narang Income Tax, Kalyani Publication
2. Vinod Singhania, Students Guide to Income Tax and Central Taxes, Taxman Publications
3. Mehrotra & Goyal, Income Tax Law & Accounts, Sathiya Bhavan Publications.
4. Dhinkar Pagare, Income Tax Law and Practice, Sultan Chand Publications
5. C.A. Raj K. Agarwal, Handbook on Income Tax, Bharath Publication

Course Outcome:

- Student gains knowledge about
- Computing income from other sources
- Assessment of individual tax liability
- Identify powers & duties of CBDT
- Computation of total income of firm
- Dynamics & techniques of Income tax planning & management in corporate sector

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	3
CO2	3	2	1	1	3
CO3	3	2	1	1	3
CO4	3	1	1	1	3
CO5	3	1	1	1	3
Average	3	1.6	1	1	3

SEMESTER IV**Elective V - E-Commerce**

Total Hours: 90
Credits: 3

Course Code: 177121

Course Objective:

- To highlight the importance of using technology in modern era
- To familiarize the students with the applications of e-commerce in business
- To impart understanding on web technology and information system
- To provide practical exposure to online shopping
- To educate the students on various e-portal payments and the legal issues encountered

Unit I

E-Commerce – Definition – Need – Advantages – e-Business and e-Commerce – Evolution and Growth of e-Commerce – Information Technology and Business – Classification of e-Commerce – Future of e-Commerce in India

18

Hours

Unit II

Framework and Application of e-Commerce in various Industries – Internet and Information Super Highway – HTML – XML- HTTP- GII

18
Hours

Unit III

Web Technology and Information System – LAN-WAN-MAN-WWW- TCP/IP -Intranet-Extranet - OSI Models – Electronic Data Interchange – Components – Benefits – Implementation of EDI

18
Hours

Unit IV

Online Shopping – Advantages – Disadvantages – Mercantile Process Model – e-Commerce contracts – e-Marketing – Market Segmentation – e-Marketing Mix – Marketing Strategies – e-Advertising – Format – Intelligent Agents – e-Customer Relationship Management

18Hours

Unit V

E-Payment – Benefits – Components – EFT – e-Payment Methods – Security Requirements in e-Payments – e-Security – Security Threats – Protection – Cyber Crimes and Cyber Laws – e-Governance in India

19 Hours

Recommended Text Books:

1. Dr. K. Abirami Devi & Dr. M. Alagammai, E-Commerce, Margham Publications
2. Sarika Gupta, Gaurav Gupta, E-Commerce, Khanna Publishing

Reference Books:

1. Parag Diwan, Sunil Sharma, E-Commerce, Excel Books
2. T M Bhasin, E-Commerce in Indian Banking , Authors Press
3. Dr. Ravi Kala Kota, Marcia Robbinson, E- Business, Pearson Education
4. Joseph P T S J, E-Commerce: An Indian Perspective, Eastern Economy Edition
5. Shivani Arora, E-Commerce, Taxmann Publications

Course Outcome:

- Students gain an understanding about
- The evolution, growth and future of e-Commerce
- Application of e-Commerce in various industries
- Components, benefits and implementation of Electronic Data Interchange
- Technicalities of online shopping
- Methods of e-payment, cyber crime, cyber law and e-governance. The competency of the students to take up employment, self-employment opportunities in e-commerce ecosystem is enhanced.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	1	1
CO2	3	3	3	1	1
CO3	3	3	3	1	1
CO4	3	3	3	1	1
CO5	3	3	3	1	1
Average	3	3	3	1	1

**QUAID-E-MILLATH GOVERNMENT COLLEGE
FOR WOMEN (AUTONOMOUS)
CHENNAI-600002**

DEPARTMENT OF COMMERCE

SYLLABUS



CHOICE BASED CREDIT SYSTEM

OUTCOME BASED EDUCATION

(OFFERED FROM THE ACADEMIC YEAR 2017-18)

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RULES AND REGULATIONS FOR THE PROGRAMME

CHOICE BASED CREDIT SYSTEM

Quaid - E –Millath Government College for Women (Autonomous) offers the Semester System of education with credits for UG courses. Credit simply means the weightage given to what is taught and what is learnt. It is normally related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures/tutorials/laboratorywork/seminar/project work/practical training/viva

voce etc, to facilitate effective teaching and learning and the credits are assigned accordingly, depending on the content and the specialization.

The minimum credit requirement for a three-year UG course shall be 140 inclusive of Part IV and Part V

REGULATIONS

2. Duration

- c. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semester, the second academic year, the third and fourth semester and the third academic year, the fifth and sixth semester.
- d. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year.

3. Course of Study

The course of study for Bachelor Degree Courses shall comprise of the following.

Foundation Courses: The courses shall comprise the study of:

1	Part I: Tamil	-	6 credits
2	Part II: English	-	6 credits
3	Part III:		
	a Core Subjects	-	91 credits
	b Allied Subjects	-	20 credits
4	Part IV:		
	c Skill Based Elective (4 Papers)	-	8 credits
	d Non Major Elective (2 Papers)	-	4 credits
	e Environmental Studies	-	2 credits

	f	Value Education	-	2 credits
		Part V		
5	g	Extension Activities	-	1 credit
6		Compulsory Extension Services		

A candidate shall be awarded a maximum of one credit for Compulsory Extension Service. All students have to enroll for NSS/NCC/ Sports and Games/Rotary/Youth Red Cross or any other service organizations in the College and shall have to put in compulsory attendance of 40 hours, which shall be duly certified. If a student lacks 40 hours attendance in the first year, she shall have to compensate the same during the subsequent years.

PROGRAMME OUTCOMES

On completion of the programme the student will be able to:

1. Apply human values
2. Identify the subject goals
3. Formulate creative skills
4. Acquire communication skills and subject knowledge
5. Analyse the responsibilities

PROGRAMME SPECIFIC OUTCOMES

On completion of B.Com (CS), the student will be able to:

PSO 1: Pursue professional courses like CA, ACS, CMA, MBA, Law etc.

PSO 2: Acquire Managerial and Entrepreneurial Skills to venture into own business/gain industry exposure

PSO 3: Develop skills relevant to the field of Marketing.

PSO 4: Acquire the relevant skills for seeking employment in Banking and Insurance sectors.

PSO 5: Secure a career as a tax/security/financial analyst.

PROGRAMME PROFILE

First Year									
Sem	P a r t	Course Code	Title Of The Paper	C r e d i t s	Hours/ Week	Total Hours	A	SE	Total
I	I	173301 Language	Tamil Paper –I	3	5	75	25	75	100
	III	173801 English	English Paper-I	3	5	75	25	75	100
	IIII	173001 Core – 1	Financial Accounting – I	5	5	75	25	75	100
	IIII	173002 Core – 2	Business Organisation	5	5	75	25	75	100
	IIII	173091 Allied – 1	Business Economics – I	5	6	90	25	75	100
	IIIV	179001 Soft Skill I	Essentials of Language & Communication	2	2	30	40	60	100
	IIIV	17301 NME – I	Banking Law & Practice	2	2	30	40	60	100
			TOTAL	25					
II	II	173302 Language	Tamil Paper –II	3	5	75	25	75	100
	III	173802 English	English Paper-II	3	5	75	25	75	100
	IIII	173003 Core – 3	Financial Accounting – II	4	5	75	25	75	100
	IIII	173004 Core – 4	Principles of Management	4	5	75	25	75	100
	IIII	173092 Allied – II	Business Economics-II	5	6	90	25	75	100
	IIIV	179002 Soft Skill II	Essentials of Spoken & Presentation Skill	2	2	30	40	60	100
	IIIV	17302 NME – II	Business Organisation	2	2	30	40	60	100
			TOTAL	23					
SECOND YEAR									
Sem	P a r t	Course Code	Title Of The Paper	C r e d	Hours/ Week	Total Hours	S A	S E	Total

				i t s					
III	IIII	173005 Core – 5	Corporate Accounting –I	4	6	90	25	75	100
	IIII	173006 Core – 6	Legal Aspects of Business	4	5	75	25	75	100
	IIII	173007 Core – 7	Banking Theory Law and Practice	3	5	75	25	75	100
	IIII	173008 Core – 8	Business Taxation	3	5	75	25	75	100
	IIII	Allied – III	Element of Statistics	5	5	75	25	75	100
	IIIV	Soft Skill III	Personality Enrichment	2	2	30	40	60	100
	IIIV	EVS		-	2	30	-	-	-
			TOTAL	21					
IV	IIII	173009 Core – 9	Corporate Accounting II	4	6	90	25	75	100
	IIII	173010 Core – 10	Entrepreneurial Development	4	6	90	25	75	100
	IIII	173011 Core – 11	Company Law	3	5	75	25	75	100
	IIII	173012 Core – 12	Marketing	3	5	75	25	75	100
	IIII	Allied – IV	Statistical Techniques	5	5	75	25	75	100
	IIIV	Soft Skill IV	Basic Computer skills & Application	2	2	30	40	60	100
	IIIV	EVS		2	1	15			100
			Extension Activities	1	-				
			TOTAL	24					
THIRD YEAR									
V	IIII	173013 Core – 13	Cost Accounting- I	4	6	90	25	75	100
	IIII	173014 Core – 14	Management Accounting -I	4	6	90	25	75	100
	IIII	173015	Practical Auditing	4	6	90	25	75	100

		Core –15							
	IIII	173016 Core – 16	Financial Services and Investment Management	4	6	90	25	75	100
	IIII	173017 Elective – I	Income Tax Law & Practice – I	5	5	75	25	75	100
	IIV		Value Education	-	1	15	-	-	-
			TOTAL	21					
VI	IIII	173018 Core – 17	Cost Accounting-II	5	6	90	25	75	100
	IIII	173019 Core – 18	Management Accounting-II	5	6	90	25	75	100
	IIII	173020 Core – 19	Human Resource Management	4	6	90	25	75	100
	IIII	173021 Elective – II	Income Tax Law & Practice – II	5	6	90	25	75	100
	IIII	173022 Elective – III	Business Finance	5	5	75	25	75	100
	IIV		Value Education	2	1	15	-	-	-
			TOTAL	26					
			TOTAL CREDITS	140					

EVALUATION PATTERN FOR CONTINUOUS ASSESSMENT

INTERNAL VALUATION BY COURSE TEACHER/S

PART III- ACCOUNTANCY & THEORY PAPERS

S.NO	COMPONENT	HOURS	MAX.MARKS	CA MARK

1	CA TEST I	1	25 (To be converted)	20*
2	CA TEST II	1	25 (To be converted)	20*
3	CA TEST II	1	25 (To be converted)	20*
3	Assignment/Seminar			25
4	Model Examination	3	75 (To be converted)	25
5	Attendance			10
	TOTAL			100 (To be converted to 25)

- Highest of two CA tests will be selected for internals

PART IV-SKB/SOFT SKILLS

COMPONENT	HOURS	MAX MARKS
Presentation skills		20
Test	1	10
Assignment		10

CA QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A – 5 x 2 marks	50	10	25
K1, K2	B – 1/2 x 5 marks	200	5	
K2, K3	C – 1/2 x 10 marks	500	10	

CA QUESTION PAPER PATTERN FOR PART IV

Knowledge Level	Section	Word Limit	Marks	Total
K 1, K2	A – 2 x 5 marks	200	10	10

RUBRICS FOR CONTINUOUS ASSESSMENT

Assignment	Content/originality/Presentation/Schematic Representation and Diagram/Bibliography
<i>Seminar</i>	Organisation/Subject Knowledge/Visual Aids/Confidence level/presentation-Communication and Language
<i>Field Visit</i>	Participation/Preparation/Attitude/Leadership
<i>Participation</i>	Answering Questions/Clearing Doubts/Participating in Group Discussions/Regular Attendance
<i>Case Study</i>	Finding the Problem/Analysis /Solution/Justification
<i>Problem Solving</i>	Understanding Concepts/Formula and Variable Identification/Logical Sequence/Answer
<i>Group Discussion</i>	Preparation/Situation Analysis/Relationship Management/Information Exchange/Delivery Skills

EVALUATION PATTERN FOR END SEMESTER ACCOUNTANCY & THEORY PAPERS

PART III (offered by the Department)

SEMESTER I/II/III/IV/V/VI

SINGLE VALUATION BY EXTERNAL EXAMINER

MAXIMUM MARKS: 75 MARKS (EXTERNAL)

PASSING MARK: 30

PART IV

SINGLE VALUATION BY INTERNAL EXAMINER

WRITTEN TEST

MAXIMUM MARKS: 60

PASSING MARK: 24

COURSE PROFILE SEMESTER – I

Core I - Financial Accounting – I

Total Hours: 75

Course Code: 173001

Credits: 5

Course Objectives:

- To impart knowledge of accounting principles
- To give an understanding of the various methods of Financial Accounting
- To enable the students to prepare journal, ledger, trial balance and cashbook

Unit – I

Meaning and Scope of Accounting – Basic Accounting Concepts and Conventions – Objectives of Accounting – Double Entry Book Keeping – Journal, Ledger, Preparation of Trial Balance Preparation of Cash Book.

12 Hours

Unit – II

Final Accounts – Manufacturing Account – Trading Account – Profit and Loss Account – Balance Sheet – Adjustments – Closing Stock, Outstanding and Prepaid Items, Depreciation, Provision for Bad debts, Provision for Discount on Debtors.

17 Hours

Unit – III

Depreciation – Meaning – Characteristics – Causes – Objectives – Basic factors affecting the amount of Depreciation – Methods of providing Depreciation – Straight-Line Method – Written Down Value Method.

17 Hours

Unit - IV

Single Entry – Meaning – Features – Defects – Differences between Single Entry and Double Entry System – Statement of Affairs Method – Conversion Method.

15 Hours

Unit – V

Fire Insurance Claims – Objectives – Meaning – Loss of Stock – Loss of Profit - Calculation of Total Stock and Claim – Total Claims on the date of Fire – Average Clause.

14 Hours

Ratio between Problem and Theory 80:20

Recommended Text Books:

1. Reddy T.S & Murthy A – Financial Accounting, Margham Publishers.
2. Gupta R L & Gupta V K – Advanced Accounting, Sultan Chand & Sons

Reference Books:

1. Dalston-L. Cecil, Jenitra-L, Merwin- Financial Accounting, Learntech Press.
2. Radha. V - Financial Accounting, Prasanna Publishers Limited
3. Jain & Narang – Financial Accounting, Kalyani Publishers, New Delhi

4. Hanif M, Mukherjee – Financial Accounting, Mc Graw Hill Education
5. Goyal B K – Basic Financial Accounting, Taxmann Publications

Course Outcome:

- Enables preparation of journal, ledger, trial balance and cash book
- Aids preparation of financial statements
- Enables calculation of profit/loss by maintaining single entry accounting
- Enables calculation and accounting for depreciation of assets
- Students will be able to calculate the amount of Fire Insurance Claim lodged with the Insurance Company

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	3
CO2	3	3	1	1	3
CO3	3	3	1	1	3
CO4	3	3	1	1	3
CO5	3	3	1	3	3
Average	3	2.6	1	1.4	3

SEMESTER – I
Core II - Business Organisation

Total Hours: 75

Course Code: 173002

Credits: 5

Course Objectives:

- To impart basic knowledge of different types of Business Organisation

- To enable an understanding of various legal and tax provisions relating to formation of business association
- To give a knowledge of provisions regarding provident fund act

Unit I

Types of Business Organisations: Sole Proprietorship, Partnership, Private and Public limited company - Co-operatives, Not for profit Business Organisations under the Societies Act - Public Sector Business Units (PSU) - Features of each one and their Merits, Suitability and Limits.

Hours 15

Unit II

Basic legal requisites in forming a Sole Proprietorship and Partnership - Comparison – Partnership Deed and its Contents, Rights, Duties and Liabilities of Partners.

Hours 15

Unit III

Basic Legal Requirements in forming an Association under the Societies Registration Act and Tamil Nadu Co-operative Societies Act .

Hours 15

Unit IV

Micro, Small and Medium Enterprises(MSME) – Meaning – Need – Objectives – Benefits – Government Incentives – Monetary and Non-Monetary.

Hours 15

Unit V

Employees Provident Fund Act – Applicability and Procedure under the Act – Benefits to Employees and Responsibilities of the Employer – ESI -.Features.

Hours 15

Recommended Text Books:

1. C.B. Gupta, Business Organisation and Management – Sultan Chand & Sons
2. P.C. Tulsian, Business Organisation and Management- Pearson Publications

Reference Books:

1. Dr. Radha & Kathiresan, Business Organisation, Prasanna Publications
2. Y.K. Bhushan, Business Organisation and Management, Sultan Chand & Sons
3. S.A.Sherlekar, Modern Business Organisation and Management - A System Approach, Himalaya Publications.
4. R.D. Agarwal, Organisation and Management, Tata McGraw Hill
5. Vijay Kumar Kaul, Business Organisation Management, Pearson Publications

Course Outcomes:

- Students understand the different forms of organization
- Students learn the legal framework governing soletradership and partnership

- Students understand the legal provisions governing Co-operative Societies and in particular the State of TamilNadu.
- Students are aware of the various incentives available to MSME
- Students understand the legal provisions relating to ESI and EPF.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	1	3
CO2	3	3	3	1	3
CO3	3	1	1	1	1
CO4	3	3	1	3	3
CO5	3	3	1	3	3
Average	3	2.6	1.8	1.8	2.6

SEMESTER – I
Non –Major Elective – I
Banking Law & Practice

Total Hours: 30
Credits: 2

Course Code: 17301

Course Objectives:-

- To teach the Non-Commerce students regarding the functions of Banking system.
- To understand the various types of negotiable instruments used
- To enable the students to understand the usage of modern services like ATM, Net Banking and RTGS.

Unit - I

Definition of Banking – Relationship between Banker and Customer.

6 hours

Unit – II

Functions of Commercial Bank – Primary Functions and Secondary Functions - Agency Utility Services.

6 hours

Unit – III

Cheque – Meaning – Crossing of Cheque – Post Dated Cheque – Stale Cheque.

6 hours

Unit – IV

Central Bank – Functions of Central Bank.

6 hours

Unit - V

Modern Service – ATM – Credit Card -Tele Banking – Net Banking – RTGS – NEFT - E-Banking .

6 hours

Recommended Text Books:

1. Sundharam Varshney, Banking Theory Law & Practice, 1st Edition , Sultan Chand & Sons.
2. S.S. Gulshan Gulshann K. Kapoor, Banking Law and Practice

Reference Books:

1. S. Natarajan, P. Kandasamy, R. Parameswaran, Banking Law and Practice 4th Edition S. Chand
2. S. Gurusamy, Banking Theory Law & Practice, 3rd Edition, Vijay Nicole
3. M. Radhaswamy, S.V. Vasudevan, S.Chand Co. Pvt. Ltd.
4. N.P. Srinivasan & Saravanavel, Development Banking in India, Kalyani Publishers
5. Prof. C. Vishwanathan, Handbook of Banking Theory Law and Practice, Anuradha Publications.

Course outcome:

- Students understand the relationship between banker and customer
- Understands about Commercial bank and its functions
- Gain knowledge about cheque transactions
- Understands Central Bank and its functions
- Acquired knowledge on Modern banking services

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	1
CO2	3	2	2	3	1
CO3	3	2	2	3	1
CO4	3	2	2	3	1
CO5	3	2	2	3	1
Average	3	2	2	3	1

COURSE PROFILE SEMESTER – II

Core III - Financial Accounting – II

Total Hours: 75
Credits: 4

Course Code: 173003

Course Objectives:

- To impart knowledge of maintaining Branch and Departmental Accounts
- To give an understanding of preparation of Partnership Accounts in cases of Admission, Retirement and Death
- To enable the students to prepare relevant accounts at the time of dissolution of a partnership firm

Unit – I

Branch Accounting – Objectives, Features – Dependent Branches – Accounting in respect of Dependent Branches – Debtors system – When goods are invoiced at Cost/Selling price – Stock and Debtors system

16 Hours

Unit –II

Departmental Accounting – Meaning – Need for Departmental Accounting – Advantages - Distinction between Departments and Branches – Methods and techniques of Departmental Accounting – Departmentalisation of Expenses – Apportionment of expenses – Inter-departmental transfer – Stock Reserve.

14 Hours

Unit – III

Partnership – Fundamentals – Admission of a partner – Adjustment of profit sharing ratio – Calculation of Sacrificing Ratio – Adjustment for Goodwill – Treatment of Goodwill on

Admission of a partner (AS 10 Method) – Revaluation of Assets and Liabilities – Accumulated Profits and Losses – Adjustment of Capital – Limited Liability Partnership.

15 Hours

Unit – IV

Retirement of a Partner – Profit sharing ratio – Gaining ratio – Treatment of Goodwill – Adjustment of capital – Death of a Partner – Ascertainment of Deceased Partner's Share of Profit (excluding Individual and Joint Life Policies)- Limited Liability Partnership.

15 Hours

Unit - V

Dissolution – Meaning – Modes of Dissolution – Settlement of Accounts – Treatment of Goodwill – Treatment of Unrecorded Assets and Liabilities – Insolvency of a Partner – Garner Vs Murray - Insolvency of all the partners – Piecemeal Distribution – Proportionate Capital Method and Maximum Loss Method - Limited Liability Partnership.

15 Hours

Ratio between Problem and Theory 80:20

Recommended Text Books:

1. Reddy T.S & Murthy A – Financial Accounting, Margham Publishers.
2. Gupta R L & Gupta V K – Advanced Accounting, Sultan Chand & Sons

Reference Books:

1. Dalston-L. Cecil, Jenitra-L, Merwin- Financial Accounting, Learntech Press.
2. Radha. V - Financial Accounting, Prasanna Publishers Limited
3. Jain & Narang – Financial Accounting, Kalyani Publishers, New Delhi
4. Hanif M, Mukherjee – Financial Accounting, Mc Graw Hill Education
5. Goyal B K – Basic Financial Accounting, Taxmann Publications

Learning Outcome:

- Enables students to prepare accounts for branches
- Students will be able to allocate and apportion the expenses among the departments and calculate Profit or Loss for each department
- Enables preparation of partnership accounts in the event of Admission by valuing goodwill
- Enables preparation of partnership accounts during retirement and death of a partner and to assess the deceased partner's share.
- Enables preparation of partnership accounts at the time of dissolution and insolvency of the firm

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	3
CO2	3	3	1	1	3
CO3	3	1	1	1	3
CO4	3	1	1	1	3
CO5	3	1	1	3	3
Average	3	1.8	1	1.4	3

SEMESTER – II

Core IV – Principles of Management

Total Hours: 75

Course Code: 173004

Credits: 4

Course Objectives:

- To familiarise with the Principles of Management
- To sow the seeds of managerial skills such as planning and organising
- To enable the students to understand the process of recruitment and styles of leadership

Unit I

Management – Meaning – Functions - Importance – Is management an Art or Science - Contributions of F.W.Taylor – Concepts of Scientific Management – Fayol Theory of Management – General Principles of Management

15 Hours

Unit II

Planning and Decision making - Steps in Decision Making- Types of Plan – Policies – Procedure – Rules – Programme – Budget –MBO–MBE.

15 Hours

Unit III

Organising – Types of Organisation – Line and Staff – Functional – Committee – Principles of Organisation - Delegation – Principles – Obstacles – Advantages – Decentralisation – Authority and Responsibility

15 Hours

Unit IV

Staffing - Meaning – Definition – Importance - Recruitment – Sources of Recruitment - Selection – Stages in Selection Process - Training – Methods of Training

15 Hours

Unit V

Directing – Meaning and Importance - Span of Control – Motivation - Maslow and Herzberg Theory – Leadership – Qualities –Styles of Leadership -Control – Process of Control – Advantages and Disadvantages - Measures to Make Control Effective – Coordination – Features – Merits and Steps.

Recommended Text Books:

1. Dinkar Pagare, Principles of Management – Sultan Chand & Sons
2. L.M. Prasad Principles of Management – Sultan Chand & Sons

Reference Books:

1. Dr. Radha & Kathiresan, Business Management – Prasanna Publications.
2. C.B.Gupta, Principles of Management - Sultan Chand and Sons
3. Dr. Jayasankar, Principles of Management - Margham Publications.
4. Dr. C.D. Balaji, Principles of Management - Margham Publications
5. Koontz, Principles of Management, MCGraw Hill Publications

Course Outcomes:

- Students understand the various principles of management
- Students understand the importance of planning
- Students are aware of the importance of the functions of organising and delegation.
- Students understand the importance of HR function in the field of recruitment, selection process and training methods.
- Students understand the importance of motivation, theories of motivation, Leadership styles and about the controlling function.

Course Mapping

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	3
CO2	3	3	3	1	3
CO3	3	3	3	1	3
CO4	3	3	1	3	3
CO5	3	3	1	3	3
Average	3	3	1.8	1.8	3

Non –Major Elective – II

Business Organisation

Total Hours: 30

Course Code: 17302

Credits: 2

Course Objectives:

- To teach the Non-Commerce students, the formation of business and various forms of Business Organisation.
- To enable the students to understand the Legal procedures relating for formation of Sole proprietorship, Partnership firm and Companies.
- To understand the merits and demerits of all forms of business Organisation.

Unit – I

Business – Meaning – Characteristics – Scope – Essentials of Successful Business – Difference between Business and Profession

6 hours

Unit – II

Sole Proprietorship, Meaning – Features – Advantages- Disadvantages.

6 hours

Unit – III

Partnership – Definition – Meaning – Advantages and Disadvantages of Partnership – Partnership Deed.

6 hours

Unit – IV

Joint Stock Company – Features - Advantages and Disadvantages – Types of Companies.

6 hours

Unit – V

Formation of Joint Stock Company – Memorandum of Association, Articles of Association, Prospectus – Certificate of Incorporation – Certificate of Commencement of Business.

6 hours

Recommended Text Books:

- 1.C.B. Gupta, Business Organisation and Management – Sultan Chand & Sons
2. P.C. Tulsian, Business Organisation and Management- Pearson Publications

Reference Books:

1. Dr. Radha & Kathiresan, Business Organisation, Prasanna Publications
2. Y.K. Bhushan, Business Organisation and Management, Sultan Chand & Sons
3. S.A.Sherlekar, Modern Business Organisation and Management - A System Approach, Himalaya Publications.
4. R.D. Agarwal, Organisation and Management, Tata McGraw Hill
5. Vijay Kumar Kaul, Business Organisation Management, Pearson Publications

Course Outcome:

- Understand the concepts of business and distinguish between profit and non- profit business.

- Understand the various forms of business like sole proprietorship and partnership.
- Enables the students to understand the various types of companies and their features.
- Prepares them to learn the formation of company and the various important documents needed for registration and commencement.
- Able to identify the problems and challenges faced by the various types of organisation.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	3
CO2	3	3	2	1	2
CO3	3	3	2	3	3
CO4	3	3	2	3	3
CO5	3	3	3	2	2
Average	3	2.8	2.2	2.4	2.6

COURSE PROFILE SEMESTER – III

Core V – Corporate Accounting – I

Total Hours: 90

Course Code: 173005

Credits: 4

Course Objectives:

- To impart knowledge relating to floating of sharecapital and raising of long term funds
- To teach the methods of redemption and valuation of Goodwill
- To enable the students to prepare accounts based on the new accounting standards

Unit -I

Issue of Shares – Issued at Par, Premium and Discount - Consideration other than Cash – Over Subscription – Under Subscription – Calls in Arrears – Calls in Advance- Forfeiture – Reissue of Shares - Issue of Debentures – At Par – Premium - Discount

18 Hours

Unit -II

Redemption of Preference Share and Debentures – Redemption out of profit – Out of Capital – Out of Provision – Sinking Fund Method – Ex Interest and Cum Interest

18 Hours

Unit -III

Final Accounts of Companies – Statement of Profit or Loss – Balance Sheet (As per Revised Schedule VI)

18 Hours

Unit -IV

Valuation of Goodwill– Simple Average Profit – Weighted Average Profit – Super Profit – Annuity Method – Capitalisation of Super Profit Method - Capitalisation Method - Valuation of Shares - Net Asset Method – Yield Method – Fair Value Method

18 Hours

Unit -V

Accounting Standards - Meaning – Objectives – Need for Accounting Standards – Significance - Indian Accounting Standards - AS 1, AS 2, AS 5, AS 6, AS 9, AS 10, AS 20 (Theory Only)

18 Hours

Ratio between Problem and Theory 80:20

Recommended Text Books:

1. T.S. Reddy & A. Murthy, Corporate Accounting, Margham Publication
2. R.L. Gupta & M. Radhaswamy – Sultan Chand and Sons

Reference Books:

1. Jain & Narang, Corporate Accounting, Kalyani Publishers
2. R. S.N. Pillai & Bagavathy Corporate Accounting- S Chand
3. Dr. R. Rangarajann & Dr. V. Chandrasekaran, Corporate Accounting, S.P. Publications
4. Radhika Raman, Corporate Accounting, McGraw Hill Publications
5. T. Joseph, Corporate Accounting McGraw Hill Publications

Course Outcome:

- To understand the procedures of issue of share and debentures
- To understand the procedure under redemption of shares and debentures
- To learn the preparation of statement of final accounts as per revised schedule VI
- To understand and learn the different methods of valuation of shares and goodwill
- To understand the need and significance of Indian Accounting Standards.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5

CO1	3	1	1	1	3
CO2	3	1	1	1	3
CO3	3	3	1	2	3
CO4	3	2	1	1	3
CO5	3	1	1	2	3
Average	3	1.6	1	1.4	3

SEMESTER – III

Core VI – Legal Aspects of Business

Total Hours: 75

Course Code: 173006

Credits: 4

Course Objectives:

- To bring out the awareness of the laws relating to Indian Contract Act and Sale of Goods Act
- To impart knowledge of the provisions of Sale of Goods Act
- To give an understanding of the principles and types of Insurance

Unit-I

Indian Contract Act – Classification of Contracts – Essential Elements of Contract – Legal Rules as to Offer – Acceptance – Consideration.

12 hours

Unit-II

Capacity – Competent Parties to a Contract – Minors – Persons of Unsound Mind – Persons Disqualified by Law - Free Consent: Coercion - Undue Influence – Fraud - Mistake – Misrepresentation - Legality of Object.

17 hours

Unit-III

Performance of Contract – Discharge of Contract – Remedies for Breach of Contract.

17 hours

Unit-IV

Sale of Goods Act – Formation – Conditions and Warranties – Caveat Emptor - Transfer of Property – Sale by Non-Owners - Performance of Contract – Rights and Duties of Buyer - Unpaid Seller

15 hours

Unit-V

Insurance – Definition – Functions – Types of Insurance – Principles – Importance to Business.

14 hours

Recommended Text Books:

1. N.D.Kapoor, Business Law, Sultan Chand Publications
2. Jayashankar, Legal aspects of business, margham Publications

Reference Books:-

1. Thulsian, Business Law, Tata McGraw Hill
2. Sumathi and Saravanel, Legal Aspects of Business, S. Chand Publication.
3. R.S.N. Pillai and Baghavathi, Legal Aspects of Business, S Chand Publication.
4. Ravi, Legal systems in Business, Margham Publications
5. Kumar, Legal aspects of Business, Concage learning

Course Outcome:

- Enables the students to impart knowledge about Sale of good act
- To educate the students about the practices of awareness of the laws relating to indian contract act
- Students will be able to improve,develop the knowledge of law
- To learn about principles of insurance regarding business
- Students knowing about rights and duties of buyer

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	3
CO2	3	3	3	1	3
CO3	3	3	3	1	3
CO4	3	3	1	3	3
CO5	3	3	1	3	3
Average	3	3	1.8	1.8	3

SEMESTER – III

Core VII – Banking Theory Law and Practice

Total Hours: 75

Course Code: 173007

Credits: 3

Course Objectives:

- To impart awareness about various types of Banking & Modern Banking Practices
- To educate about the relationship of Customer with his Banker
- To give an understanding of the advances given by Banks

Unit -I

Introduction to Banking – Origin - Classification of Banks on the basis of Ownership, Kinds, Types and Business - Role of Banks for Economic Development

Unit -II

Banker Customer Relationship – Customer - Duration Theory – Relationship as – Debtor and Creditor –Trustee and Beneficiary – Lessor and Lessee - Special Types of Customers – Minor – Married Women.

Unit –III.

Reserve Bank of India – Origin and Definition – Organisation and Management – Functions – Banking Function – Supervisory Function - Promotional Function.

Unit –IV

Functions of Commercial Banks – Primary Functions – Secondary Functions - E- Banking – Core Banking – Mobile Banking –Green Banking.

Unit –V

Priority Sector Advances - Meaning – Classification of Advances - Areas under Priority Sector - Agriculture Sector – Small Scale Industrial Sector - Small Road and Water Transport Operators - Professionals – Retail Trade – Education Loan - Women Entrepreneurs – Self-Help Groups – Recovery of Loans.

Recommended Text Books:

1. Sundharam Varshney, Banking Theory Law & Practice, 1st Edition , Sultan Chand & Sons.
2. S.S. Gulshan Gulshann K. Kapoor, Banking Law and Practice

Reference Books:

1. S. Natarajan, P. Kandasamy, R. Parameswaran, Banking Law and Practice 4th Edition S. Chand
2. S. Gurusamy, Banking Theory Law & Practice, 3rd Edition, Vijay Nicole
3. M. Radhaswamy, S.V. Vasudevan, S.Chand Co. Pvt. Ltd.
4. N.P. Srinivasan & Saravanavel, Development Banking in India, Kalyani Publishers
5. Prof. C. Vishwanathan, Handbook of Banking Theory Law and Practice, Anuradha Publications.

Course Outcome

- Students understand the meaning of banking and its provision under Banking Regulation Act.
- Students understand the meaning of RBI and its functions.
- Gain knowledge on primary and secondary functions of commercial banks and modern banking, credit card and debit card.
- Enable the students to understand relationship between Banker and customer.
- Gain knowledge on concepts of Priority sector Advance and areas under priority sector.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	3	2
CO2	3	2	2	3	2
CO3	3	3	3	3	2
CO4	3	3	3	3	2
CO5	3	3	3	3	3
Average	3	3	2.8	3	2.2

SEMESTER – III

Core VIII – Business Taxation

Total Hours: 75
Credits:3

Course Code: 173008

Course Objectives:

- To familiarise the students with the provisions of Indirect Tax
- To enable the students to comprehend the concept of VAT, Service Tax
- To impart the knowledge about the provisions relating to central excise duty and customs act

Unit-I

Central Sales Tax- Objectives of CST Act- Inter-State Sale- Exemptions from CST- Registration of Dealers- Levy and Collection of CST- Meaning, Procedure, Calculation of Taxable Turnover and CST payable.

15 hours

Unit -II

Central Excise Duty - Types of Excise duty - Valuation of Goods - Clearance of Goods - Exemptions from Excise Duty - Procedure for Assessment and Payment of Excise Duty.

15 hours

Unit -III

Customs Act - Objectives - Levy and Collections - Types of Customs Duty - Procedure for Assessment and Payment of Customs Duty - Clearance of Goods - Warehousing Provisions - Duty Drawback Provisions.

15 hours

Unit -IV

Service Tax- Meaning- Persons liable to pay Service Tax- Elements of Service Tax- Taxable services- Value of taxable service- Different services on which tax is payable- Service Tax Procedures.

15 hours

Unit -V

Value Added Tax (VAT) - Meaning-Objectives- Merits- Demerits- Types- VAT Rates- Dealers liable to pay VAT - Tamil Nadu VAT – Goods and Service Tax: Meaning – Reasons for implementation - Registration Procedures.

15 hours

Recommended Text Books:

1. Dinkar Pagare, Business Taxation, Sultan Chand & Sons

Reference Books:

1. Dr. Radha and Dr. Parameswaran, Business Taxation, Prasanna Publishers.
2. V. Balachandran, Indirect Taxation, Sultan Chand & Sons
3. T.S. Reddy and Y. Hari Prasad Reddy, Business Taxation, Margham Publication
- 4.

Course Outcome:

- To familiarise the students with the provisions of Enables the students to impart knowledge about procedure and Assessment of Excise duty
- To educate the students about the provision of indirect tax
- Students will be able to improve,develop the knowledge of taxation
- Students understand the instrument of economic policy
- Students realize to learn the progressive tax, regressive tax in a proportional tax provisions

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	3
CO2	3	2	1	1	3
CO3	3	2	1	1	3
CO4	3	1	1	1	3
CO5	3	1	1	1	3
Average	3	1.6	1	1	3

COURSE PROFILE SEMESTER – IV

Core IX - Corporate Accounting – II

Total Hours: 90

Course Code: 173009

Credits:4

Objectives:

- To emphasise the accounting procedures of Banks and Insurance Companies
- To elaborate the other related procedures of Amalgamation, Absorption, Reconstruction
- To enable students to prepare accounts at the time of liquidation of companies

Unit -I

Basis for Accounting Standard – AS 13, AS 14, AS 17, AS 18, AS 21 and AS 29 (Theory only)

Hours 18

Unit –II

Amalgamation – Meaning – Purchase Consideration – Computation of Purchase Consideration – Methods of Accounting – Pooling of Interest Method – Purchase Method (Inter Company Holdings, Owings Excluded) – Absorption - Reconstruction of Companies – Meaning of Internal Reconstruction – Differences - Accounting Problems

Hours 18

Unit –III

Liquidation of Companies – Meaning – Types of Winding Up – Preferential Creditors – Secured Creditors – Unsecured Creditors – Contributories - Statement of Affairs – Deficiency (or) Surplus Account – Liquidators Final Statement of Accounts

Hours 18

Unit –IV

Accounting of Banking Companies- Preparation of P&L Account – Balance sheet

Hours 18

Unit -V

Accounting of Insurance Companies Life and General (Fire and Marine only) – Forms – Revenue Account – P&L Account – Balance Sheet – Ascertainment of Correct Life Assurance Fund – Valuation of Balance sheet

Hours 18

Ratio between Problem and Theory 80:20

Course Outcome:

- To understand and learn the important accounting standard basically needed for the company accounts
- To learn the amalgamation absorption and reconstruction of companies as per companies act
- To understand the procedure for liquidation and to learn the preparation of final statement of accounts
- To learn the accounting procedures for preparing the final statements of Banking companies
- To know the procedure and preparation of final statement of accounts of insurance companies
-

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3		2	3
CO2	3	1		1	3

CO3	3	2		2	3
CO4	3	1		3	3
CO5	3	3		3	3
Average	3	2		2.2	3

Recommended Text Books:

1. T.S. Reddy & A. Murthy, Corporate Accounting, Margham Publication
2. R.L. Gupta & M. Radhaswamy – Sultan Chand and Sons

Reference Books:

1. Jain & Narang, Corporate Accounting, Kalyani Publishers
2. R. S.N. Pillai & Bagavathy Corporate Accounting- S Chand
3. Dr. R. Rangarajann & Dr. V. Chandrasekaran, Corporate Accounting, S.P. Publications
4. Radhika Raman, Corporate Accounting, McGraw Hill Publications
5. T. Joseph, Corporate Accounting McGraw Hill Publications

SEMESTER – IV

Core X – Entrepreneurial Development

Total Hours: 90
Credits:4

Course Code: 173010

Course Objectives:

- To inculcate the spirit of entrepreneurship in the students
- To enhance job creators from mere job seekers
- To enable an understanding of the sources of finance available for entrepreneurs

Unit -I

Introduction – Meaning, Need, Role and Importance of Entrepreneurship – Entrepreneur - Characteristics – Classification of Entrepreneurs -Difference between Entrepreneur and Manager - Factors affecting Entrepreneurship

12 hours

Unit -II

Business Idea Generation Techniques – Technical Source – Market Source - Identification of Business opportunities – Sources – Marketing Feasibility – Stages in Product Development – Product Life Cycle – Financial and Economic Feasibility – Methods of Evaluating Financial Feasibility – Sources of Finance- Internal and External Sources of Finance

19 hours

Unit -III

Entrepreneurial Growth – Role of Government and Non – Government Agencies – EDP – KVIC – TCO – SIPCOT- DIC- NSIC – IDBI – ICICI – SFC- LIC

20 hours

Unit -IV

Problems of Entrepreneurs - Women Entrepreneurs – Rural Entrepreneurship – Export Import Procedures – MSME – Role – Sickness in Small Scale Industries – Causes – Role of BIFR

20 hours

Unit -V

Project Appraisal – Introduction – Classification of Projects – Project Life Cycle – Techniques – Pay Back – ROI – DCF – IRR – NPV – PERT and CPM – Project Report – Meaning – Contents – Guidelines for Project Preparation

19 hours

Recommended Text Books:

1. N.P.Srinivasan and C.B.Gupta, Entrepreneurial Development, Sultan Chand & Sons
2. Balraj Singh, Entrepreneurship Development, Wisdom Publications

Reference Book:

1. Dr. Radha and Kathiresan, Entrepreneurial Development, Prasanna Publication

2. Kanka S, Entrepreneurial Development, S.Chand Publishers
3. CS Das Mahabatra, Entrepreneurship-Micro Small and Medium Enterprise, Wisdom Publications
4. G.S. Batra, Development of Entrepreneurship, Deep & Deep Publications
5. Robert.D. Hisrich Michael P.Peter, Dean A. Shepherd, Tata McGraw Hill

Course Outcome:

- To educate conceptual framework of entrepreneur development.
- To impart knowledge about the entrepreneur programmes
- Students will be able to improve,develop the knowledge of identify the business opportunities
- Students understand the various agencies to promote entrepreneurial growth
- Students realize To learn the key processes necessary to bring new product and services to market and key challenges facing by the entrepreneur

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	2	1	3
CO2	1	3	1	1	1
CO3	1	3	2	1	1
CO4	1	3	1	1	2
CO5	1	3	1	1	2
Average	1	3	1.4	1	1.6

SEMESTER – IV

Core XI – Company Law

Total Hours:75

Course Code: 173011

Credits: 3

Course Objective:

- To educate about the provisions of Companies Act 2013
- To elucidate the various provisions of the Company proceeding
- To enable the students to understand the provisions relating to meetings and winding up of a company

Unit –I

Evolution of Company Law - Company Act 2013 – Definition – Characteristics – Classification – Doctrine of Corporate Veil – Formation - Certification of Incorporation – Certificate of Commencement of Business

12 hours

Unit -II

Memorandum of Association – Content – Doctrine of Ultra Vires – Effects of Ultra Vires Transactions – Articles of Association – Contents – Doctrine of Indoor Management – Constructive Notice – Prospectus – Contents – Statement in lieu of Prospectus

17 hours

Unit -III

Shares and Share Capital – Kinds of Shares – Dematerialisation – Meaning – Advantages of Dematerialisation – Borrowing powers

17 hours

Unit -IV

Meetings and Resolutions – Kinds of Meetings – Annual General Meeting – Extra Ordinary Meeting – Resolution – Ordinary and Special – Proxy – Quorum

15 hours

Unit -V

Winding Up of a Company – Modes of Winding Up – Winding Up by the Court – Voluntary Winding Up – Members Voluntary Winding up – Creditors Voluntary Winding Up

14 hours

Recommended Text Books:

1. N.D. Kapoor, Elements of Co. Law, Sultan Chand Publication
2. P.K.Ghosh, Company Secretarial Practice, S.Chand Publication

Reference Book:

1. M.R. Srinivasan Law, M.R. Srinivasan, Margham Publications
2. Ashok K. Bagrial, Company Law, Vikas Publications
3. Dr. V. Radha, Company Law, Prasanna Publishers and Distributors
4. Gaffoor, Company Law, Vijay Nichole Imprints
5. Alan J. Dignam, John P. Lowry, Company Law, Oxford University

Course Outcome:

- To educate conceptual framework of legal procedure & compliance Requirements of Dividends.
- To impart knowledge about the company secretary duties & Responsibilities

- Students will be able to improve,develop the knowledge of identify the special codes & corporate governance
- Students understand the amendments made in the Companies Act, 2013.
- Students gain an in depth knowledge about the benefits and complexities associated with the company form of organization structure and the role and importance of Company Secretary.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	1
CO2	3	3	1	1	1
CO3	3	3	1	3	1
CO4	3	3	1	3	1
CO5	3	3	3	1	3
Average	3	3	1.4	1.8	1.4

SEMESTER – IV **Core XII – Marketing**

Total Hours:75

Course Code: 173012

Credits: 3

Objectives:

- To educate the students about the importance of Marketing
- To create an awareness about the principles and practices of Marketing
- To give an understanding of pricing and promotion

Unit – I

Marketing – Definition – Nature - Scope – Importance - Objectives - Modern Marketing Concept - Functions of Marketing.

Hours 15

Unit – II

Market Segmentation: Need, Criteria, Basis and Steps for Segmentation - Market Targeting and Positioning – Consumer Behaviour – Meaning – Definition – Objectives – Consumer Decision Making Process – Factors influencing Consumer Behaviour.

Hours 15

Unit – III

Product Planning: Meaning, Features, Importance, Product Life Cycle, Product Policies - Marketing Myopia – Product Line - Reasons for failure of New Product - Branding and Packaging.

Hours 15

Unit – IV

Pricing: Importance, Significance, Factors, Kinds, Policies and Procedures for Price Determination - Channels of Distribution – Types of Channels – Factors influencing Channel Selection - Recent Trends in Marketing: Online Marketing – Tele Marketing – Relationship Marketing.

Hours 15

Unit – V

Promotion: Promotion Mix – Advertising – Publicity – Sales Promotion – Personal Selling – Sales Promotion Techniques - Qualities of Salesmen - Sales Promotion Programmes – Advertisement Copy

Hours 15

Recommended Text Books:

1. Rajan Nair, Marketing, Sultan Chand & Sons
2. Pillai R.S. N. and Bagavathi V. Modern Marketing, Sultan Chand and Sons

Reference Books:

1. Philip Kotler, Principles Of Marketing, Prentice Hall Of India
2. Mamoria and Joshi, Principles and Practice of Marketing in India, Sultan Chand & Sons
3. Rudani R.B., Basic of marketing management, S.Chand Publications
4. Rustom S Davar, Modern Marketing Management, Crown Publishing house
5. S. A. Sherlekar, Modern Marketing, Himalaya Publications

Course Outcome:

- Understanding the marketing functions and its application in modern era
- Getting deeper understanding about the market segments and the consumer behaviour
- Making them to get the clear picture of product planning and its life cycle
- Creating awareness regarding recent trends in marketing and identification of different channel of distribution

- Getting the revelation of various ways for sales promotion programmes

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	1	1
CO2	3	2	3	1	1
CO3	3	2	3	1	1
CO4	3	2	3	1	1
CO5	3	2	3	1	1
Average	3	2	3	1	1

COURSE PROFILE SEMESTER – V

Core XIII – Cost Accounting – I

Total Hours: 90

Course Code: 173013

Credits: 4

Course Objectives:

- To give an understanding of the basic cost concepts
- To enable preparation of cost sheet and quotations
- To impart knowledge of element of cost

Unit –I

Introduction to Cost Accounting – Definition of Cost Accounting – Scope – Objectives – Importance – Advantages & Limitations of Cost Accounting – Cost Accounting vs. Financial Accounting – Methods of Costing – Techniques of Costing – Classification of Cost.

12 Hours

Unit -II

Elements of Cost – Materials – Labour – Expenses – Direct and Indirect Costs – Overheads – Classification of Overheads – Expenses excluded from Costing – Cost sheet or Statement of Cost – Treatment of Stocks or Inventories – Stocks of Raw Material and Finished Goods – Tenders and Quotations

18 Hours

Unit -III

Material Control – Purchase Routine – Stock Levels — Bin Card – Stores Ledger – Inventory Control and its Techniques – Economic Order Quantity – ABC Analysis – Perpetual Inventory System – Just-In-Time Inventory – VED Analysis – Inventory Turnover Ratio – Pricing of Material Issues – FIFO, LIFO, HIFO, Base Stock, Simple average, Weighted Average, Standard Price, Inflated Price and Market Price Methods.

22 Hours

Unit -IV

Labour Cost – Time Card and Job Card – Overtime and Idle Time – Labour Turnover – Methods of Wage Payment – Remuneration and Incentives – Premium and Bonus Plans.

18 Hours

Unit -V

Overheads – Factory, Administration, Selling and Distribution – Allocation – Apportionment of Overheads – Primary and Secondary Distribution of Overheads - Absorption of Overheads – Machine Hour Rate – Under and Over Absorption of Overheads.

20 Hours

Course outcome:

- To get an overall idea of cost accounts in comparison with other accounts
- To understand the components of cost and to frame the cost sheet for tenders and quotations
- To probe into the issues regarding treatment and control of materials
- To understand the essence of labour cost and its treatment
- To get wider knowledge about overhead treatment and its absorption in various departments

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	1	3
CO2	3	3	3	1	1
CO3	3	2	3	1	1
CO4	3	3	1	1	2
CO5	3	3	3	1	2
Average	3	2.6	2.4	1	1.8

Recommended Book:

1. T.S. Reddy and Y. Hariprasad Reddy, Cost Accounting, Margham Publications
2. S.P. Jain and K.L. Narang, Cost Accounting, Kalyani Publishers

Reference Books:

1. M. N. Arora, Cost and Management Accounting, Vikas publicationns
2. Dr. S.N. Maheshwari, Principles of Cost Accounting, Sultan Chand & Sons
3. R.S.N. Pillai and V. Bagavathi, Cost Accounting, S.Chand
4. S.P. Iyengar, Cost and Management Accounting, Sultanchand & Sons
5. P.T. PattanChetty, D.R. Palekar, Cost Accounting, R. Chand & Co.

SEMESTER – V

Core XIV – Management Accounting – I

Total Hours: 90

Course Code: 173014

Credits: 4

Course Objectives:

- To educate the students about the sources and uses of funds
- To enable them to draw inference by adopting management accounting techniques
- To give knowledge about preparation of budgets

Unit – I

12Hours

Management Accounting – Meaning – Definition – Nature And Scope – Utility And Limitations – Principles – Functions – Management Accounting and Financial Accounting – Cost Accounting and Management Accounting - Financial Statements – Meaning - Techniques of Financial Statement Analysis – Uses and Limitations of Financial Statement Analysis.

Unit – II

22 Hours

Ratio Analysis – Meaning of Ratios – Classification of Ratios – Analysis and Interpretation of different Ratios – Profitability Ratios – Coverage Ratios – Turnover Ratios – Financial Ratios – Uses and Limitations of Ratio Analysis.

Unit-III

21 Hours

Budgeting And Budgetary Control - Meaning – Definition – Importance – Classification of Budget – Preparation of Sales Budget - Production Budget - Cash Budget – Flexible Budget – Zero Base Budgeting..

Unit – IV

17 Hours

Fund Flow Analysis – Meaning of Fund Flow Statement – Uses of Fund Flow Statement – Parties Interested in Fund Flow Statement – Preparation of Fund Flow Statement – Treatment of Provision for Taxation, Proposed Dividend and Depreciation – Statement of Changes in Financial Position.

Unit – V

18 hours

Cash Flow Analysis – Meaning of Cash Flow Statement – Preparation of Cash Flow Statement (Simple Problems Only – AS 3 method) – Utility and Limitations of Cash Flow Analysis.

Ratio between Problem and Theory 80:20

Recommended Books:

1. T.S. Reddy and Y. Hariprasad Reddy, Management Accounting, Margham Publications
2. S.N.Maheswari, Management Accounting, Sultan Chand & Sons

Reference Books:

1. A.R.Ramanathan, N.L.Hingorani,T.S.Grewal, Management Accounting,Sultan Chand & Sons
2. M.Y.Khan,P.K.Jain,, Management Accounting, Tata McGraw Hill
3. I.M.Pandey, Management Accounting, Vikas Publishing
4. S.P. Iyengar, Cost and Management Accounting, Sultanchand & Sons
5. M.N.Arora, Management Accounting, Vikas Publishing

Course Outcome

- Students are able to carry out the analysis and interpretation of financial statements using the techniques of management accounting.
- Enables students to analyse the liquidity, solvency and profitability by preparing different ratios.
- Imparts understanding on the importance and preparation of different budgets.
- Helps students to prepare fund flow statement and understand the movement of funds.
- Facilitates preparation of cash flow statement to track the inflow and outflow of cash.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	3
CO2	3	3	1	1	3
CO3	3	3	1	1	3
CO4	3	3	1	2	3
CO5	3	3	1	2	3
Average	3	2.8	1	1.4	3

SEMESTER – V**Core XV – Practical Auditing****Total Hours: 90****Course Code: 173015****Credits: 4****Course Objectives:**

- To educate the students about the principles and objectives of Auditing
- To create an awareness on the Procedures of Auditing relating to vouching and verification
- To impart knowledge about appointment of Auditors and preparation of Audit report

Unit I

Auditing – Definition – Meaning – Objectives – Kinds of Audit – Organisation Basis - Time and Scope Basis - Specific Objectives Basis – Internal Check – Internal Control – internal Audit – Audit Programme.

18 Hours

Unit II

Vouching – Meaning – Importance – Types of Vouchers - Vouching of Cash Transactions - Cash Receipts – Cash Payments - Vouching of Trading Transactions - Purchases and Sales Book.

18 Hours

Unit III

Verification – Meaning – Objectives – Differences between Verification and Vouching – Valuation – Basis – Valuation of Assets – Land and Buildings – Plant and Machinery - Investments - Furniture – Current Assets – Stock-in-Trade – Debtors – Bills Receivable – Loans & Advances - Valuation of Liabilities – Creditors - Bills Payable – Loans – Share Capital – Debentures

18 Hours

Unit IV

Appointment of Auditors - Qualification – Disqualification – Re-appointment of Auditor - Resignation – Removal of Auditor – Powers – Duties – Liabilities – Statutory – Contractual – Liabilities under Common Law – Other Liabilities.

18 Hours

Unit V

Audit Report – Contents – Kinds – Investigation – Characteristics – Objects –Qualities of an Investigator - Investigation Report – EDP Audit – Features of Auditing through Computers – Internal Control over Computer Based Accounting System – Organisational Controls - Documentation Controls – Access Controls – Hardware Controls – Application Controls – Limitation of EDP Audit.

18 Hours

Recommended Books:

1. B. N. Tandon, S. Sundarsanam, S. Sundarbabu - Practical Auditing

2. Norman Spencer, Auditing Principles, East African Educational Publisher Limited

Reference Books:

1. Dinkar Pagare, Principles of Auditing, Sultan Chand Publications, New Delhi
2. Dr. I. Natarajan – Practical Auditing, Margham Publications
3. S.K. Basu, Auditing Principles and Techniques, Pearson Education
4. Vengadamani, Practical Auditing, Margham Publication
5. Ravinder Kumar, Virender Sharma, Auditing Principles and practice, PH learning Ltd.

Learning Outcome:

- Gives an understanding to the students about the framework and concept of auditing system.
- Enables understanding of the procedures of vouching
- Enables to have an insight about the verification procedures of assets and liabilities
- Reveals the formalities needed for appointment and removal of auditor
- Exhibits the requirements of audit report and the internal control

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	3
CO2	3	2	1	1	3
CO3	3	2	1	1	3
CO4	3	2	1	1	3
CO5	3	2	1	1	3
Average	3	2	1	1	3

SEMESTER – V

Core XVI – Financial Services and Investment Management

Total Hours: 90

Course Code: 173016

Credits: 3

Course Objective:

- To impart knowledge about the various segments of Financial Services.
- To facilitate the student to know about the various Investment Avenues
- To enable students to analyse the investment decision

Unit – I

Financial Service: Concept – Objectives – Characteristics – Players – Growth of Financial Services in India - Problems of Financial Services – Factors influencing Financial Services Environment .

Hours -17

Unit - II

Merchant Banking: Meaning – Services/Function offered by Merchant Bankers –Factoring: Characteristics – Types - Venture Capital: Definition – Functions – Stages - Mutual Funds: Meaning and Definition - Features – Classification – Managing Mutual Funds in India - Credit Rating:– Features

Hours -19

Unit – III

Money Market – Meaning – Importance – Characteristics – Instruments traded under Money Market – Capital Markets - Meaning – Need – Classification of Capital Market – Functions of New Issue Market – Methods of Trading in New Issue Market - Secondary Market - Stock Exchanges – Listing Procedures - SEBI Guidelines towards Capital Market

Hours-20

Unit - IV

Investment- Meaning – Objectives – Investment Alternatives : Real Investments – Contingent Investment – Titular Investment – Gambling

Hours-17

Unit – V

Analysis of Investments – Fundamental Analysis: Economic Analysis, Industrial Analysis, Company Analysis – Technical Analysis – Dow Theory – Line Chart – Japanese Candle Sticks.

Hours-17

Recommended Text book:

1. S.Gurusamy, Financial Services, Vijay Nicole Imprints Private Limited
2. Punithavathy Pandian, Security Analysis and Portfolio Management, Vikas Publishing House

Reference Books:

1. C Rama Gopal, Management of Financial Services, Vikas publishing Pvt Ltd.
2. M.Y.Khan, Financial Services, Tata McGraw-Hill Education
3. V.K. Bhalla, Investment Management, Sultan Chand & Sons.
4. B.Santhanam, Financial markets and services, Margham Publication Pvt.ltd.
5. Dr.L Natarajan.Investment Management, Margham Publication Pvt.ltd.

Learning Outcome:

- Students gain an in depth knowledge about the role of financial institution and financial market in the financial services.
- Students get proficiency merchant banking operations.
- Students get familiarize about capital market and money market.
- Enable the students to aware of various investment alternnnatives
- Gain in depth knowledge towards analysis of investment avenues

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	3
CO2	3	3	1	1	3
CO3	3	3	1	1	3
CO4	3	3	1	2	3
CO5	3	3	1	2	3
Average	3	2.8	1	1.4	3

SEMESTER – V**Elective I – Income Tax Law & Practice – I****Total Hours: 75****Course Code: 173017****Credits: 5****Course Objectives:**

- To give an overview of Income Tax Act 1961.
- To bring out the role played by the Income Tax Authorities
- To enable calculation taxable income under the heads Salary, House property and Business

Unit - I

Basic Concepts of Taxation – Objectives of Taxation – Kinds of Taxes – Definition of Important Terms – Income – Assessment – Assessee – Person – Assessment Year – Previous Year – Heads Of Income – Gross Total Income – Total Income – Residential Status of an Individual and Company

15 Hours**Unit - II**

Computation of Salary Income – Meaning - Features of Salary – Allowances – Types of Allowances – Perquisites – Kinds of Perquisites – Types of Provident Fund – Gratuity – Commutation of Pension – Deductions from Salary

15 Hours

Unit - III

Computation of Income from House Property – Gross Annual Value – Net Annual Value – Computation under Different Circumstances – Let Out – Self Occupied- Deemed to be Let Out - Deductions under Section 24

15 Hours**Unit - IV**

Profits and Gains of Business and Profession – Allowable Expenses – Disallowed Expenses – General Deductions – Provisions relating to Depreciation – Deemed Business Profits – Undisclosed Income - Computation of Income from Business or Profession

15 Hours**Unit - V**

Income Tax Authorities – CBDT- Commissioner of Income Tax and Assessing Officer – Appointment – Functions – Control – Jurisdiction – Powers

15 Hours**Ratio between Problem and Theory 80:20****Recommended Text Book**

3. T.S. Reddy and Y. Hariprasad Reddy, Income Tax Law and Practice, Margham Publication
4. Gaur & Narang Income Tax, Kalyani Publication

Reference Books

6. Gaur & Narang Income Tax, Kalyani Publication
7. Vinod Singhania, Students Guide to Income Tax and Central Taxes, Taxman Publications
8. Mehrotra & Goyal, Income Tax Law & Accounts, Sathiya Bhavan Publications.
9. Dhinkar Pagare, Income Tax Law and Practice, Sultan Chand Publications
10. C.A. Raj K. Agarwal, Handbook on Income Tax, Bharath Publication

Course Outcome:

- It enables the students to learn about the basic concepts of Income and to determine the residential status of different types of assessee
- Able to apply provisions and to compute income from salary
- Students understand the meaning of gross and net annual value and computation of income from House Property
- Analyse and apply the provisions to calculate business and professional income
- Equip the students about functions, jurisdiction and powers and duties of CBDT and assessing officers of income tax

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2		2	3
CO2	3				3
CO3	3				3

CO4	3	3		3	3
CO5	3	3		3	3
Average	3	2.6		2.6	3

COURSE PROFILE SEMESTER – VI

Core XVII – Cost Accounting – II

Total Hours: 90

Course Code: 173018

Credits: 5

Course Objectives:

- To give an understanding of different methods of costing such as Job, Contract and Process costing
- To impart knowledge about reconciliation of cost and financial profits
- To enable preparation of cost accounts for all service industries

Unit – I

Reconciliation of Cost and Financial Accounts – Importance or Need for Reconciliation – Causes for Disagreement of Profits – Procedure for Reconciliation – Presentation of Reconciliation.

12 Hours

Unit – II

Job Costing – Definition of Job and Job Costing – Features of Job Costing – Objectives – Job Costing Procedure – Forms used in Job costing – Batch Costing – Determination of EBQ or Economic Lot Size

18 Hours

Unit – III

Contract Costing – Introduction – Characteristics Features of Contracts and Contract Costing – Distinction between Job Costing and Contract Costing – System of Contract Costing – Recording of Costs of a Contract – Recording of Value and Profit on Contracts – Profit or Loss on Contracts.

22 Hours

Unit – IV

Process Costing – Meaning – Features – Types of Industries Using Process Costing – Distinction Between Job and Process Costing – Costing Procedure – Process Losses (Normal Loss, Abnormal Loss/Gain only).

18 Hours

Unit –V

Operating or Service Costing – Meaning and Definition – Range of Application of Operating Costing – Transport Costing- Power House or Boiler House Costing – Costing for Cinema Theatres – Costing for Lodging Houses.

20 Hours

Ratio between Problem and Theory 80:20

Recommended Books:

1. T.S. Reddy and Y. Hariprasad Reddy, Cost Accounting, Margham Publications
2. S.P. Jain and K.L. Narang, Cost Accounting, Kalyani Publishers

Reference Books:

1. M. N. Arora, Cost and Management Accounting, Vikas publicationns
2. Dr. S.N. Maheshwari, Principles of Cost Accounting, Sultan Chand & Sons
3. R.S.N. Pillai and V. Bagavathi, Cost Accounting, S.Chand
4. S.P. Iyengar, Cost and Management Accounting, Sultanchand & Sons
5. P.T. PattanChetty, D.R. Palekar, Cost Accounting, R. Chand & Co.

Course outcome:

- To understand the procedure of reconciliation of cost and financial accounts
- To acquire knowledge about the job and batch costing
- To get wider knowledge regarding the contract costing
- To have the awareness of the cost involved in the process of manufacturing
- To familiarize with the cost involved for various services

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	2
CO2	3	2	1	1	1
CO3	3	2	2	1	1
CO4	3	3	3	1	1
CO5	3	3	3	1	1
Average	3	2	2	1	1.2

SEMESTER – VI

Core XVIII – Management Accounting – II

Total Hours: 90

Course Code: 173019

Credits: 5

Course Objectives:

- To enlighten the students about capital budgeting and its various methods
- To educate the students about managerial decision making
- To give an understanding of standard costing

Unit I

Basics of Capital Budgeting – Concepts of Capital Budgeting – Importance of Capital Budgeting – Capital Budgeting Process – Evaluation of Investment Proposals – Traditional Methods – Pay-Back Period Method – Average Rate of Return Method – Time Adjusted Methods – Net Present Value Method – Profitability Index Method (Simple Problems Only)

17 Hours

Unit II

Marginal Costing – Concept and Characteristics – Advantages and Limitations – Absorption Costing - Meaning - Difference between Marginal Costing and Absorption Costing – Cost Volume Profit Analysis – Break Even Analysis – Margin of Safety

17 Hours

Unit III

Decision Making – Fixation of Selling Price – Make or Buy Decision - Selection of Suitable Product Mix – Key Factor - Acceptances of Special Order – Substitution of a New Product for the Old One - Effect of Changes in Sales Price (Simple Problems Only)

17 Hours

Unit IV

Working Capital – Meaning – Definition – Concepts – Classification of Working Capital – Importance – Redundant Working Capital – Dangers – Factors determining Working Capital - Estimation of Working Capital Requirements

17 Hours

Unit V

Standard Costing – Meaning – Advantages – Limitations – Cost Variances – Direct Material Cost Variance – Direct Labour Cost Variance (Simple Problem only)

17 Hours

Ratio between Problem and Theory 80:20

Recommended Books:

1. T.S. Reddy and Y. Hariprasad Reddy, Management Accounting, Margham Publications
2. S.N.Maheswari, Management Accounting, Sultan Chand & Sons

Reference Books:

1. A.R.Ramanathan, N.L.Hingorani, T.S.Grewal, Management Accounting, Sultan Chand & Sons
2. M.Y.Khan, P.K.Jain, Management Accounting, Tata McGraw Hill
3. I.M.Pandey, Management Accounting, Vikas Publishing
4. S.P. Iyengar, Cost and Management Accounting, Sultanchand & Sons
5. M.N.Arora, Management Accounting, Vikas Publishing

Course Outcome:

- Enables the students to evaluate investment proposals using capital budgeting technique.
- Imparts understanding on concepts of marginal costing and absorption costing.
- Students are able to apply marginal costing technique in decision making.
- Students are enabled to estimate working capital requirements of different businesses.
- Students are able to compute variances and analyse reasons for the same.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	2
CO2	3	3	1	1	1
CO3	3	3	1	1	1
CO4	3	3	1	1	2
CO5	3	3	1	1	2
Average	3	3	1	1	1.6

SEMESTER – VI

CORE XIX – HUMAN RESOURCE MANAGEMENT

Total Hours: 90

Course Code: 173020

Credits: 4

Course Objectives:

- To give an understanding of nature and significance of Human Resources in the organisations.

- To provide knowledge about the various mechanisms in HRM
- To impart knowledge of training and transfer of human resource in an organisation

Unit – I

Nature and Scope of HRM – Concepts – Characteristics – Objectives – Importance – Functions – Policies - HRM as Profession - Difference between Personnel Management and HRM

18 Hours

Unit – II

Human Resource Planning – Objectives – Importance – Process - Recruitment and Selection – Process – Policy – Sources – Techniques – Steps in Selection Process

18 Hours

Unit – III

Training – Methods – Techniques & Identification of Training Needs – Training and Development

18 Hours

Unit– IV

Performance Appraisal – Objectives – Importance – Process – Problems – Essentials of an Effective Performance Appraisal System – Methods and Techniques – Job Evaluation Concepts -Objectives – Process – Uses – Limitations – Essentials of Successful Job Evaluation

18 Hours

Unit – V

Transfer - Needs and Objectives – Types – Policy – Promotion - Basis of Promotion - Termination of Services – Career Development – Mentoring

18 Hours

Recommended Books:

1. C.B. Gupta, Human Resource Management, Sultan Chand & Sons
2. J. Jayashankar, Human Resource Management, Margam Publications

Reference Book:

1. Dwivedi – Human Relations and organization Behaviour
2. Dr.V.Radha, Human Resource Management, Prasanna Publishers and Distributors
3. Pravin Durai, Human Resource Management, Pearson Publications
4. Mathis, Human Resource Management, Cengage Learning Publication
5. L.M. Prasad, Human Resource Management, Sultan Chand & Sons

Course outcome:

- To acquire knowledge on the concept of Human Resource Management

- Students understand the various sources and methods of recruiting the employees in the organisation
- Students gain knowledge on placement and Training
- To facilitate the knowledge about performance appraisal and different methods.
- To provide an idea about promotion and compensation policy.

Course Mapping

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	3
CO2	2	3	3	3	3
CO3	2	3	3	3	2
CO4	1	3	3	3	1
CO5	1	1	1	1	1
Average	1.6	2.4	2.6	2.6	2

SEMESTER - VI

Elective II – Income Tax Law & Practice – II

Total Hours: 90

Course Code: 173021

Credits: 5

Objectives:

- To enable the students to compute the gross total income and the tax liability
- To educate them about the deduction to be claimed from total income
- To give an understanding of computation of deduction of tax at source

Unit - I

Capital Gains – Definition of Capital Asset – Computation of Capital Gains – Long and Short Term – Transfer – Cost of Acquisition – Cost of Improvement – Exempted Capital Gain

Hours 18

Unit - II

Income from Other Sources – Deduction – Dividends – Interest on Securities – Bond Washing Transactions – Sale cum Interest Securities – Casual Income - and Other relevant provisions - Computation

Hours 18

Unit – III

Set Off and Carry Forward of Losses – Provisions – Computation - Clubbing of Income – Negative Income – Deemed Income – Provisions - Computation

Hours 18

Unit - IV

Assessment of Individuals – Deduction allowable from Gross Total Income (80C, 80CCC, 80CCD, 80CCD1B, 80CCE, 80CCG, 80D, 80DD, 80DDB, 80E, 80G, 80GG, 80GGA, 80GGB, 80GGC, 80QQB, 80RRB, 80TTA and 80U) - Computation of Tax Liability.

Hours 18

Unit - V

Deduction of Tax at Source – Advance payment of Tax – Permanent Account Number (theory only) – Procedure for Assessment–Filing of Return – Voluntary Return-Revised Return – Defective Return – Self Assessment – Summary Assessment – Scrutiny Assessment – Best Judgment Assessment.

Hours 18

Ratio between Problem and Theory 80:20

Recommended Text Books:

1. T.S. Reddy and Y. Hariprasad Reddy, Income Tax Law and Practice, Margham Publication
2. Gaur & Narang Income Tax, Kalyani Publication

Reference Books

1. Gaur & Narang Income Tax, Kalyani Publication
2. Vinod Singhanian, Students Guide to Income Tax and Central Taxes, Taxman Publications
3. Mehrotra & Goyal, Income Tax Law & Accounts, Sathiya Bhavan Publications.
4. Dhinkar Pagare, Income Tax Law and Practice, Sultan Chand Publications
5. C.A. Raj K. Agarwal, Handbook on Income Tax, Bharath Publication

Course Outcome:

- Students understand to identify the types of Assets and to compute Long term and Short term Capital Gain and able to apply the deductions.
- To enlighten the concepts of income from sources and to enable them to compute
- Enabling the students to have a detailed idea on set off and carry forward of income and clubbing of income and computation thereof
- Able to compute the tax liability of an individual and understand the application of provisions for deduction under section 80
- To acquire knowledge about PAN and time limit for filing returns

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	3
CO2	3	3	1		3
CO3	3	3	1		3
CO4	3	3	1		3
CO5	3	3	1		3
Average	3	3	1	1	3

SEMESTER – VI**Elective III – Business Finance****Total Hours: 75****Course Code: 173022****Credits: 5****Objectives:**

- To introduce the students to the concepts relevant for Business Finance
- To acquaint them with various skills and techniques necessary for effective decision making in finance related matters
- To impart the skills required for cash and inventory management

Unit – I

Introduction to Business Finance: Definition – Nature – Functions – Scope — Objectives – Profit Maximization Vs Wealth Maximization – Role of Finance Manager – Inter-relationship between Investment, Financing and Dividend Decisions.

Hours 15**Unit – II**

Long Term Sources of Finance: Financial Needs – Sources of raising Finance – Equity Shares – Preference Shares – Retained Earnings – Debentures – Long Term Loans from Financial Institutions and Commercial banks.

Hours 15**Unit – III**

Short Term Sources of Finance: Trade credit – Advances from Customers – Discounting of Bills of Exchange – Bank Overdraft – Cash credit – Letter of Credit – Working Capital Demand Loan – Commercial Paper – Advances against Goods – Financing of Export Trade by Banks – Public Deposit.

Hours 15**Unit – IV**

Cash Management – Control Aspects – Concentration Banking – Lock Box System – Playing the Float – Cash Cycle – Cash Turnover.

Hours 15

Unit - V

Inventory Management – Meaning – Need – Benefits – Risks and Cost of Inventory Holding – Management of Inventory – Techniques of Inventory Management.

Hours 15

Recommended Text Books:

1. S.N. Maheshwari; Financial Management, Sultan Chand & Sons
2. M. Pandey; Financial Management, Vikas Publishing House

Reference Books:

1. M.Y. Khan and P.K.Jain; Financial Management, Tata McGraw Hill
2. Prasanna Chandra, Finance Sense, McGraw Hill Publications
3. Suwendu Narayan Rai, Financial Management with new approach, Himalaya Publications
4. Dr.V. Balu Financial Management, Venkateshwara Publications
5. R.M. Srivastava, Financial Management and policy, Himalayas publishing House

Course Outcome:

- To give the understanding of finance and its related concepts
- To give the idea of long term sources of finance
- To impart the knowledge regarding export and import procedures
- To give an understanding cash management, its cycle and turnover
- To make the students aware of necessity of inventory management and its techniques

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3		3	3
CO2	3	3	2	3	3
CO3	3	2		2	3
CO4	3	3	2	2	3
CO5	3	3	2	2	3
Average	3	2.8	2	2.4	3

PROGRAMME SPECIFIC OUTCOMES

- 1. To inculcate self-confidence for the students to face interviews.**
- 2. To have enough power and vision to project in advance as to what outcome shall result and achieve success in work place.**
- 3. To inculcate behavioural values that involves good manners required to make life successful.**
- 4. To help elderly and handicapped people to have happier life by creating helping tendency in student's minds.**
- 5. To have faith in fundamental Human Rights, Promote and Ensure individual and collective well-being.**

SEMESTER VI

VALUE EDUCATION

Total Hours: 30

Credits: 2

Course Code:

Course Objectives:

- To develop positive thinking and change of attitude
- To transform in order to shine, succeed and aim to become an achiever

- To provide basic ethics and educate on human values essential for character-building in life

Unit I

“Building Self-Confidence” by Norman Vincent Peale.

Unit II

“Living Excellence” by Anthony Robbins.

Unit III

“Kinds of Values” by Ignachimuthu. S. J.

Unit IV

“What is Ethics?” by Swami Vivekananda.

Unit V

“Essential Characteristics of Human Rights by H.Victor Gonde.

Content and Treatment as in

1. Touchstone: Synergy of values

Course Outcomes:

1. Building Self- Confidence and Positive Thinking.
2. Realise the quality of life and aim to be an achiever in life.
3. Understand the importance of personal, social, moral, spiritual and behavioural values.
4. Understand basic ethics and follow certain moral principles.
5. Understand Human Rights and its characteristics.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	3	3	3	3	2
CO3	3	3	3	3	3
CO4	3	2	3	2	2
CO5	3	3	2	2	3
AVERAGE	3	2.6	2.6	2.4	2.8

**QUAID-E-MILLATH GOVERNMENT COLLEGE
FOR WOMEN (AUTONOMOUS)
CHENNAI-600002**

DEPARTMENT OF CORPORATE SECRETARYSHIP

SYLLABUS



**CHOICE BASED CREDIT SYSTEM
OUTCOME BASED EDUCATION
(OFFERED FROM THE ACADEMIC YEAR 2018-19)**

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RULES AND REGULATIONS FOR THE PROGRAMME CHOICE BASED CREDIT SYSTEM

Quaid - E –Millath Government College for Women (Autonomous) offers the Semester System of education with credits for UG courses. Credit simply means the weightage given to

what is taught and what is learnt. It is normally related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the courses in the curriculum design. Each course is designed variously under lectures/tutorials/laboratorywork/seminar/project work/practical training/viva voce etc, to facilitate effective teaching and learning and the credits are assigned accordingly, depending on the content and the specialization.

The minimum credit requirement for a three-year UG course shall be 140 inclusive of Part IV and Part V

REGULATIONS

4. Duration

- e. There will be two semesters in each academic year. The first academic year shall comprise of the first and second semester, the second academic year, the third and fourth semester and the third academic year, the fifth and sixth semester.
- f. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year

5. Course of Study

6.

The course of study for Bachelor Degree Courses shall comprise of the following.

Foundation Courses: The courses shall comprise the study of:

1	Part I: Tamil	-	6 credits
2	Part II: English	-	6 credits

3	Part III:		
	a	Core Subjects	- 91 credits
	b	Allied Subjects	- 20 credits
4	Part IV:		
	c	Skill Based Elective (4 Papers)	- 8 credits
	d	Non Major Elective (2 Papers)	- 4 credits
	e	Environmental Studies	- 2 credits
	f	Value Education	- 2 credits
5	Part V		
6	g	Extension Activities	- 1 credit
7	Compulsory Extension	Services	

A candidate shall be awarded a maximum of one credit for Compulsory Extension Service. All students have to enroll for NSS/NCC/ Sports and Games/Rotary/Youth Red Cross or any other service organizations in the College and shall have to put in compulsory attendance of 40 hours, which shall be duly certified. If a student lacks 40 hours attendance in the first year, she shall have to compensate the same during the subsequent years.

PROGRAMME OUTCOMES

On completion of the programme the student will be able to:

6. Apply human values
7. Identify the subject goals
8. Formulate creative skills
9. Acquire communication skills and subject knowledge
10. Analyse the responsibilities

PROGRAMME SPECIFIC OUTCOMES

On completion of B.Com (CS), the student will be able to:

PSO 1: Pursue professional courses like CA, ACS, CMA, MBA, Law etc.

PSO 2: Acquire managerial and entrepreneurial skills to venture into own business/gain industry exposure

PSO 3: Develop skills relevant to the field of marketing.

PSO 4: Acquire the relevant skills for seeking employment in banking and insurance sectors.

PSO 5: Secure a career as a tax/security/financial analyst.

PROGRAMME PROFILE – B. COM(CS)

FIRST YEAR									
Sem	Part	Course Code	Title Of The Paper	Credits	Hours/ Week	Total Hours	CA	SE	Total
I	I	173301	Tamil Paper –I	3	4+2	90	25	75	100
	II	173801	English Paper-I	3	4	60	25	75	100
	III	183101	Financial Accounting –I	5	5	75	25	75	100
	III	183102	Business Management	5	5	75	25	75	100
	III	183191	Business Economics	5	6	90	25	75	100
	IV	179001	Essentials of Language & Communication	2	2	30	40	60	100
	IV	17301	Banking Law & Practice	2	2	30	25	75	100
			TOTAL	25					
II	I	173302	Tamil Paper –II	3	4+2	90	25	75	100
	II	173802	English Paper-II	3	4	60	25	75	100
	III	183103	Financial Accounting –II	4	5	75	25	75	100
	III	183104	Commercial Law	4	5	75	25	75	100
	III	183192	Marketing	5	6	90	25	75	100
	IV	179002	Essentials of Spoken & Presentation Skill	2	2	30	40	60	100

	IV	17302	Business Organisation	2	2	30	40	60	100
			TOTAL	23					
SECOND YEAR									
Sem	Part	Course Code	Title Of The Paper	Credits	Hours/ Week	Total Hours	CA	SE	Total
III	I	173303	Tamil Paper –III	3	6	90	25	75	100
	11	173803	English Paper-III	3	6	90	25	75	100
	III	183105	Corporate Accounting I	4	5	75	25	75	100
	III	183106	Company Law & Secretarial Practice – I	4	4	60	25	75	100
	III	183193	Business Statistics	5	5	75	25	75	100
	IV	179003	Personality Enrichment	2	2	30	40	60	100
	IV		EVS	-	2	30	-	-	-
			TOTAL	21					
IV	I	173304	Tamil Paper –IV	3	6	90	25	75	100
	II	173804	English Paper-IV	3	6	90	25	75	100
	III	183107	Corporate Accounting II	4	5	75	25	75	100
	III	183108	Company Law & Secretarial Practice - II	4	5	75	25	75	100
	III	183194	Statistical Techniques	5	5	75	25	75	100
	IV	179004	Basic Computer skills & Application	2	2	30	40	60	100
	IV		EVS	2	1	15			

			Extension Activities	1					
			TOTAL	24					
THIRD YEAR									
Sem	Part	Course Code	Title Of The Paper	Credits	Hours/ Week	Total Hours	CA	SE	Total
V	III	183109	Management Accounting	4	6	90	25	75	100
	III	183110	Banking Theory Law and Practice	4	6	90	25	75	100
	III	183111	Human Resource Management	4	6	90	25	75	100
	III	183112	Entrepreneurial Development	4	6	90	25	75	100
	III	183113	Income Tax Law and Practice I	5	5	75	25	75	100
	IV		Value Education	-	1	15			
			TOTAL	21					
VI	III	183114	Indirect Taxation	5	6	90	25	75	100
	III	183115	Industrial Law and Public Relations	5	6	90	25	75	100
	III	183116	Institutional Training	4	5	75	75 PR O	25 VIV A	100
	III	183117	Cost Accounting	5	6	90	25	75	100
	III	183118	Income Tax Law and Practice II	5	6	90	25	75	100
	IV		Value Education	2	1	15			
			TOTAL	26					

EVALUATION PATTERN FOR CONTINUOUS ASSESSMENT

INTERNAL VALUATION BY COURSE TEACHER/S

PART III- ACCOUNTANCY & THEORY PAPERS

S.NO	COMPONENT	HOURS	MAX.MARKS	CA MARK
1	CA TEST I	1	25 (To be converted)	20*
2	CA TEST II	1	25 (To be converted)	20*
3	CA TEST II	1	25 (To be converted)	20*
3	Assignment/Seminar			25
4	Model Examination	3	75 (To be converted)	25
5	Attendance			10
	TOTAL			100 (To be converted to 25)

- Highest of two CA tests will be selected for internals

PART IV-SKB/SOFT SKILLS

COMPONENT	HOURS	MAX MARKS
Presentation skills		20
Test	1	10
Assignment		10

CA QUESTION PAPER PATTERN

Knowledge Level	Section	Word Limit	Marks	Total
K 1	A – 5 x 2 marks	50	10	

K1, K2	B – 1/2 x 5 marks	200	5	25
K2, K3	C – 1/2 x 10 marks	500	10	

CA QUESTION PAPER PATTERN FOR PART IV

Knowledge Level	Section	Word Limit	Marks	Total
K 1, K2	A – 2 x 5 marks	200	10	10

RUBRICS FOR CONTINUOUS ASSESSMENT

Assignment	Content/originality/Presentation/Schematic Representation and Diagram/Bibliography
Seminar	Organisation/Subject Knowledge/Visual Aids/Confidence level/presentation-Communication and Language
Field Visit	Participation/Preparation/Attitude/Leadership
Participation	Answering Questions/Clearing Doubts/Participating in Group Discussions/Regular Attendance

Case Study	Finding the Problem/Analysis/Solution/Justification
Problem Solving	Understanding Concepts/Formula and Variable Identification/Logical Sequence/Answer
Group Discussion	Preparation/Situation Analysis/Relationship Management/Information Exchange/Delivery Skills

EVALUATION PATTERN FOR END SEMESTER ACCOUNTANCY & THEORY PAPERS

PART III (offered by the Department)

SEMESTER I/II/III/IV/V/VI

SINGLE VALUATION BY EXTERNAL EXAMINER

MAXIMUM MARKS: 75 MARKS (EXTERNAL)

PASSING MARK: 30

PART IV

SINGLE VALUATION BY INTERNAL EXAMINER

WRITTEN TEST

MAXIMUM MARKS: 60

PASSING MARK: 24

PART III

PROJECT (INSTITUTIONAL TRAINING)

SEMESTER VI

VALUATION BY EXTERNAL EXAMINER

MAXIMUM MARKS: 100 (Project 75, Viva 25)

PASSING MARKS: 40

COURSE PROFILE – SEMESTER I

Core I - FINANCIAL ACCOUNTING – I

Total Hours: 75

Course Code: 183101

Credits: 5

Course Objectives:

- To impart knowledge of accounting principles
- To give an understanding of the various methods of Financial Accounting
- To show the difference between the single and double entry system

Unit - I

Meaning and Scope of Accounting – Basic Accounting Concepts and Conventions – Objectives of Accounting – Double Entry Book Keeping – Journal – Ledger – Preparation of Trial Balance – Preparation of Cash Book
12 hours

Unit - II

Final Accounts – Manufacturing Account – Trading Account – Profit and Loss Account – Balance Sheet – Adjustments – Closing Stock, Outstanding and Prepaid Items, Depreciation, Provision for Bad debts, Provision for Discount on Debtors.
17 hours

Unit - III

Depreciation – Meaning – Characteristics – Causes – Objectives – Basic factors affecting the amount of Depreciation – Methods of providing Depreciation – Straight Line Method – Written Down Value Method. **17 hours**

Unit - IV

Single Entry – Meaning – Features – Defects – Differences between Single Entry and Double Entry System – Statement of Affairs Method – Conversion Method. **15 hours**

Unit - V

Fire Insurance Claims – Objectives – Meaning – Loss of Stock – Loss of Profit - Calculation of Total Stock and Claim – Total Claims on the date of Fire – Average Clause. **14 hours**

Ratio between Problem and Theory 80:20

Recommended Book:

1. T.S.Reddy & A. Murthy – Financial Accounting, Margham Publishers.
2. Dalston Cecil, Jenitra.L. Mervin, Financial Accounting, Learntech Press

Reference Books:

1. Dalston-L. Cecil, Jenitra-L. Merwin- Financial Accounting, Learntech Press.
2. Radha V Financial Accounting Prasanna Publishers Limited
3. R.L. Gupta & V.K.Gupta – Advanced Accounting, Sultan Chand & Sons
4. Jain & Narang – Financial Accounting, Kalyani Publishers, New Delhi
- 5.P.C Tulsian, Financial Accounting, Pearson Education

Course Outcome:

- To educate framework of legal procedure of accounting concept & procedures.
- To impart knowledge about the final accounting system.
- Students will be able to improve,develop the knowledge of identify the single & double entry,depreciation methods.
- Enables calculation and accounting for depreciation of assets
- Students will be able to calculate the amount of Fire Insurance Claim lodged with the Insurance Company

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	3
CO2	3	3	1	1	3
CO3	3	3	1	1	3
CO4	3	3	1	1	3
CO5	3	3	1	3	3
Average	3	2.6	1	1.4	3

SEMESTER I
Core II – BUSINESS MANAGEMENT

Total Hours: 75
Credits: 5

Course Code: 183102

Course Objectives:

- To orient the students about the concepts of Management
- To provide an insight about Selection, Training and Controlling functions
- To provide the skills to direct and manage the organisation

Unit I

Management – Meaning – Functions - Importance – Is management an Art or Science - Contributions of F.W.Taylor – Concepts of Scientific Management – Fayol Theory of Management – General Principles of Management

15 hours

Unit II

Planning and Decision making - Steps in Decision Making- Types of Plan – Policies – Procedure – Rules – Programme – Budget –MBO–MBE.

15 hours

Unit III

Organising – Types of Organisation – Line and Staff – Functional – Committee – Principles of Organisation - Delegation – Principles – Obstacles – Advantages – Decentralisation – Authority and Responsibility

15 hours

Unit IV

Staffing - Meaning – Definition – Importance - Recruitment – Sources of Recruitment - Selection – Stages in Selection Process - Training – Methods of Training

15 hours

Unit V

Directing – Meaning and Importance - Span of Control – Motivation - Maslow and Herzberg Theory – Leadership – Qualities –Styles of Leadership -Control – Process of Control – Advantages and Disadvantages - Measures to Make Control Effective – Coordination – Features – Merits and Steps.

15 hours

Recommended Book:

1. Dinkar Pagare, Principles of Management – Sultan Chand & Sons
2. L.M. Prasad Principles of Management – Sultan Chand & Sons

Reference Books:

6. Dr. Radha & Kathiresan, Business Management – Prasanna Publications.
2. C.B.Gupta, Principles of Management - Sultan Chand and Sons
3. Dr. Jayasankar, Principles of Management - Margham Publications.
4. Dr. C.D. Balaji, Principles of Management - Margham Publications

Course Outcomes:

- Students understand the various principles of management
- Students understand the importance of planning
- Students are aware of the importance of the functions of organising and delegation.
- Students understand the importance of HR function in the field of recruitment, selection process and training methods.
- Students understand the importance of motivation, theories of motivation, Leadership styles and about the controlling function.

Course Mapping

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	3
CO2	3	3	3	1	3
CO3	3	3	3	1	3
CO4	3	3	1	3	3
CO5	3	3	1	3	3
Average	3	3	1.8	1.8	3

SEMESTER I
NME 1 - OFFICE MANAGEMENT

Course Objective:

- To acquaint non commerce students with the concept of managing a modern office
- To orient students about office systems and procedures
- To enable an understanding of the office layout and modes of office communication

Unit I

Meaning of Office – Function of Office – Office Accommodation

Unit II

Office systems and Procedures – Importance of Systems – Functions and Responsibilities of Systems and Procedure

Unit III

Office Manual – Office Services – Office Committee – Office Forms

Unit IV

Office Communication – Importance – Barriers – Types of Communication

Unit V

Office locations layout – Private Office – Office Environment

Recommended Book:

1. Office Management – P. K. Gosh
2. Office Procedure – Muthusamy, Brinda, Sanjeev, Swamy Publishers (P) Ltd.

Reference Books:

1. Office Management – Chopra
2. Office Management – R.S.N. Pillai & Bhagavathi, S. Chand
3. Front Office Management – S. K. Bhatnagar, Frank Bros
4. Text Book of Front Office Management & Operations - Sudhir Andrews, McGraw Hill Education

Course outcome:

- Brings about an understanding of the concepts and functions of office management
- Enables students to learn and apply the system and procedures in an office

- Facilitates understanding of the clerical aspects of office management
- Students comprehend the importance of communication and the methods to overcome the barriers
- Students get an understanding of office layout and about general office environment.

Course Mapping

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	1
CO2	3	3	2	3	1
CO3	3	3	2	3	2
CO4	3	3	3	2	1
CO5	3	3	2	2	1
Average	3	3	2.4	2.4	1.2

COURSE PROFILE SEMESTER – II

Core III - FINANCIAL ACCOUNTING – II

Total Hours: 75
Credits: 4

Course Code: 183103

Course Objectives:

- To impart knowledge about branch and departmental accounts
- To illustrate the partnership fundamentals and the treatment at the time of admission and retirement
- To teach the modes of dissolution

Unit – I

Branch Accounting – Objectives – Features – Dependent Branches – Accounting in respect of Dependent Branches – Debtors system – When goods are invoiced at Cost/Selling price – Stock and Debtors system **12 hours**

Unit –II

Departmental Accounting – Meaning – Need for Departmental Accounting – Advantages – Distinction between Departments and Branches – Methods and Techniques of Departmental Accounting – Departmentalisation of Expenses – Apportionment of Expenses – Inter-Departmental Transfer – Stock Reserve **17 hours**

Unit – III

Partnership – Fundamentals – Admission of a partner – Adjustment of profit sharing ratio – Calculation of Sacrificing Ratio – Adjustment for Goodwill – Treatment of Goodwill on Admission of a partner (AS 10 Method) – Revaluation of Assets and Liabilities – Accumulated Profits and Losses – Adjustment of Capital **17 hours**

Unit – IV

Retirement of a Partner – Profit Sharing Ratio – Gaining ratio – Treatment of Goodwill – Adjustment of Capital – Death of a Partner – Ascertainment of Deceased Partner's Share of Profit (excluding Individual and Joint Life Policies) **15 hours**

Unit – V

Dissolution – Meaning – Modes of Dissolution – Settlement of Accounts – Treatment of Goodwill – Treatment of Unrecorded Assets and Liabilities – Insolvency of a Partner – Garner Vs Murray – Insolvency of all the Partners – Piecemeal Distribution – Proportionate Capital Method and Maximum Loss Method **14 hours**

Ratio between Problem and Theory 80:20**Recommended Book:**

1. T.S.Reddy & A. Murthy – Financial Accounting, Margham Publishers.
2. Dalston Cecil, Jenitra.L. Mervin, Financial Accounting, Learntech Press

Reference Books:

1. Dalston-L. Cecil, Jenitra-L. Merwin- Financial Accounting, Learntech Press.
2. Radha V Financial Accounting Prasanna Publishers Limited
3. R.L. Gupta & V.K.Gupta – Advanced Accounting, Sultan Chand & Sons
4. Jain & Narang – Financial Accounting, Kalyani Publishers, New Delhi

5. P.C Tulsian, Financial Accounting, Pearson Education

Course Outcome:

- To educate about the framework of legal procedure of branch & departmental accounting concept & procedures.
- To impart knowledge about the partnership fundamentals & Treatment of goodwill.
- Students will be able to develop the knowledge of identifying the modes of dissolution of partnership
- Students will be able to allocate and apportion the expenses among the departments and calculate Profit or Loss for each department
- Enables students to prepare Partnership Accounts in the event of Admission, Retirement, Death and Dissolution

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	3
CO2	3	3	1	1	3
CO3	3	3	1	1	3
CO4	3	3	1	1	3
CO5	3	3	1	3	3
Average	3	2.6	1	1.4	3

SEMESTER – II

Core IV – COMMERCIAL LAW

Total Hours: 75

Course Code: 183104

Credits: 4

Course Objectives:

- To create an awareness of the laws relating to Indian Contract Act and Special Contract
- To impart knowledge of the provisions regarding Sale of Goods Act and Contract of Agency, Bailment and Pledge
- To provide the knowledge of indemnity in case of breach

Unit I

Meaning of Law – Sources of Law – Classification of Contract – Express and Implied – Valid, Void and Voidable Contracts – Executed and Executory Contracts – Unilateral and Bilateral Contracts.

15 hours

Unit II

Structure and Formation of Contract – Essential Elements of Contracts – Consensus-ad –idem – Offer – Acceptance – Lawful Consideration- Capacity of parties – Free Consent – Mistake – Misrepresentation – Fraud – Coercion – Undue influence – Lawful Objects – Discharge of Contracts – Remedies for Breach of Contracts.

15 hours

Unit III

Contract of Indemnity and Guarantee – Essential Difference between Contract of Indemnity and Contract of Guarantee – Revocations of Continuing Guarantee – Surety's Liability – Rights of Surety – Discharge of Surety from Liability – Bailment – Pledge.

15 hours

Unit IV

Contract of Agency – Essentials – Creation of Agency – Kinds of Agents – Agent Authority – Duties and Rights of Principal – Agent when personally liable – Delegation of Authority – Sub-Agent – Substituted Agent – Termination of Agency – Irrevocable Agency

15 hours

Unit V

Law of Sale of Goods – Definition – Sale and Agreement to Sell – Sale and Hire-Purchase – Conditions and Warranties – Duties and Rights of Buyer and Seller – Right of Unpaid Seller – Auction Sale

15 hours

Recommended Books:

1. N.D.Kapoor, Business Law, Sultan Chand Publications
2. Dr. Radha, Business Law, Prasanna Publishers

Reference Book :

1. Thulsian, Business Law, Tata McGraw Hill
2. M.C. Kuchhal, Business Law, Vikas Publishing House
3. Dr. V. Balu, Business Law, Himalaya Publishing House
4. V. Balachandran, S. Thothathri, Business Law, McGraw Hill Education
5. J. Jayashankar, Commercial Law, Margham Publication

Course Outcomes:

- Students understand the classification of Contracts
- Students understand the various elements of Contracts
- Students are aware of the provisions relating to Indemnity, Guarantee, Bailment and Pledge
- Students understand the legal framework that governs the contract of agency
- Students understand the legal framework that governs the sale of goods and the differences between sale and agreement to sell.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	1
CO2	3	3	1	1	1
CO3	3	3	1	3	1
CO4	3	3	1	3	1
CO5	3	3	3	1	3
Average	3	3	1.4	1.8	1.4

Semester II**Non Major Elective II - Entrepreneurial Development****Objectives**

1. To provide a conceptual knowledge of entrepreneurship
2. To provide knowledge on identification of business opportunities and sources of finance

Unit I

Introduction – Meaning of Entrepreneurship – Characteristics

Unit II

Classification of Entrepreneurs – Factors affecting Entrepreneurship

Unit III

Identification of Business Opportunities – Project formulation – Evaluation – Methods and Techniques

Unit IV

Sources of Finance – Entrepreneurial Development Programmes – Micro Finance.

Unit V

Role of Entrepreneur in Economic Growth – Women Entrepreneurs – Issues and Challenges

Recommended Text Books:

3. N.P.Srinivasan and C.B.Gupta, Entrepreneurial Development, Sultan Chand & Sons
4. Balraj Singh, Entrepreneurship Development, Wisdom Publications

Reference Book:

6. Dr. Radha and Kathiresan, Entrepreneurial Development, Prasanna Publication
7. Kanka S, Entrepreneurial Development, S.Chand Publishers
8. CS Das Mahabatra, Entrepreneurship-Micro Small and Medium Enterprise, Wisdom Publications

Course Outcomes:

- Identifies and develops entrepreneurial traits
- Helps them to identify and exploit profitable business opportunities
- Prepares them to overcome the hurdles of entrepreneurship
- To acquaint them with various entrepreneurial development programmes
- To enable them to contribute as prospective women entrepreneurs to economic growth

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	1
CO2	3	3	2	2	1
CO3	3	3	2	2	1
CO4	3	3	3	2	1
CO5	3	3	3	2	1
Average	3	3	2.4	2	1

COURSE PROFILE SEMESTER – III

Core V - CORPORATE ACCOUNTING – I

Total Hours: 75

Course Code: 183105

Credits: 4

Course Objectives:

- To provide the knowledge relating to issue and redemption of shares
- To teach the methods of valuation of Goodwill.
- To relate the provisions of various accounting standards

Unit -I

Issue of Shares – Issued at Par, Premium and Discount - Consideration other than Cash – Over Subscription – Under Subscription – Calls in Arrears – Calls in Advance- Forfeiture – Reissue of Shares - Issue of Debentures – At Par – Premium - Discount

15 Hours

Unit -II

Redemption of Preference Share and Debentures – Redemption out of profit – Out of Capital – Out of Provision – Sinking Fund Method – Ex Interest and Cum Interest

15 Hours

Unit -III

Final Accounts of Companies – Statement of Profit or Loss – Balance Sheet (As per Revised Schedule VI)

15 Hours

Unit -IV

Valuation of Goodwill– Simple Average Profit – Weighted Average Profit – Super Profit – Annuity Method – Capitalisation of Super Profit Method - Capitalisation Method - Valuation of Shares - Net Asset Method – Yield Method – Fair Value Method

15 Hours

Unit -V

Accounting Standards - Meaning – Objectives – Need for Accounting Standards – Significance - Indian Accounting Standards - AS 1, AS 2, AS 5, AS 6, AS 9, AS 10, AS 20 (Theory Only)

15 Hours

Ratio between Problem and Theory 80:20

Recommended Text Books:

1. T.S. Reddy & A. Murthy, Corporate Accounting, Margham Publication
2. R.L. Gupta & M. Radhaswamy – Sultan Chand and Sons

Reference Books:

6. Jain & Narang, Corporate Accounting, Kalyani Publishers
7. R. S.N. Pillai & Bagavathy Corporate Accounting- S Chand
8. Dr. R. Rangarajann & Dr. V. Chandrasekaran, Corporate Accounting, S.P. Publications
9. Radhika Raman, Corporate Accounting, McGraw Hill Publications
10. T. Joseph, Corporate Accounting McGraw Hill Publications

COURSE OUTCOME:

- To understand the procedures of issue of share and debentures
- To understand the procedure under redemption of shares and debentures
- To learn the preparation of statement of final accounts as per revised schedule VI
- To understand and learn the different methods of valuation of shares and goodwill
- To understand the need and significance of Indian Accounting Standards.

Course Mapping

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	3
CO2	3	1	1	1	3
CO3	3	3	1	2	3
CO4	3	2	1	1	3
CO5	3	1	1	2	3
Average	3	1.6	1	1.4	3

SEMESTER-III**Core VI – COMPANY LAW AND SECRETARIAL PRACTICE – I****Total Hours:60****Credits: 4****Course Code: 183106**

Course Objectives:

- To impart the basic knowledge of Companies Act 2013
- To teach the procedures of incorporation, issues of prospectus and raising of share capital
- To bring out the difference in the role played by members and shareholders

Unit I

Evolution of Company law – Meaning and Characteristics of a Company – New concepts in modern Company Law - Comparative Analysis and Benefits of different Business Models – Illegal Association – Lifting of Corporate Veil

Role and Importance of Company Secretary – Key Managerial personnel – Compliance Officer – Compulsory appointment – Qualification and Disqualification – Powers, Duties and Responsibilities of a Secretary – Resignation and Removal of Company Secretary – Officer in Default.

10 hours

Unit II

Incorporation of a Company – Memorandum and Articles of Association – Effect of Registration – Commencement of Business – Alteration of Memorandum and Articles of Association - Doctrine of Constructive Notice – Ultra Vires and Indoor Management – Duties of Company Secretary in the Formation and Incorporation of the Company.

10 hours

Unit III

Prospectus – Matters to be stated in the Prospectus – Offer of Securities for Sale – Shelf Prospectus - Red Herring Prospectus – Civil and Criminal liability for Mis-statement of Prospectus – Statement in lieu of Prospectus – Punishment for Personation for Acquisition of Securities – Global Depository Receipt – Securities and Exchange Board of India (SEBI) – Powers to regulate Issue and Transfer of securities – Private Placement – Role of Secretary in the Issue of Prospectus

15

hours

Unit IV

Share capital – Meaning and Kinds – Alteration of Capital – Issue of further Capital – Issue of Further Capital, Right Issue, Bonus Issue, Private and Preferential Allotment – Rules and Regulations Relating to the Issue of Capital – Role of Company Secretary in the Issue of Capital – Dematerialization and Re-materialization of Securities – Reduction Of Share Capital and the Procedure thereof – Buy-Back of securities – Issue of Share Capital at a Premium and Discount – Rules relating to the same.

15

hours

Unit V

Meaning of the term Member and Differences between a Member and Shareholder and Contributory - How to become a Member – Rights and Responsibility of a Member – Transfer and Transmission of Shares (including Depository Mode) – Nomination and its Importance – Who can be admitted as Member – Manner of becoming a member – Can a member be removed – Statutory Register to be maintained – Electronic Mode.

10

hours

Recommended Text Books:

3. N.D. Kapoor, Elements of Co. Law, Sultan Chand Publication
4. P.K.Ghosh, Company Secretarial Practice, S.Chand Publication

Reference Book:

1. M.R. Srinivasan Law, M.R. Srinivasan, Margham Publications
2. Ashok K. Bagrial, Company Law, Vikas Publications
3. Dr. V. Radha, Company Law, Prasanna Publishers and Distributors
4. Gaffoor, Company Law, Vijay Nichole Imprints
5. Alan J. Dignam, John P. Lowry, Company Law, Oxford University

Course Outcome:

- To educate framework of legal procedure of company law
- To impart knowledge about the company secretary duties & responsibilities.
- Students will be able to improve, develop the knowledge of incorporation of a company
- Students understand the amendments made in the Companies Act, 2013.
- Students gain an in depth knowledge about the benefits and complexities associated with the company form of organization structure and the role and importance of Company Secretary.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	1
CO2	3	3	1	1	1
CO3	3	3	1	3	1
CO4	3	3	1	3	1
CO5	3	3	3	1	3
Average	3	3	1.4	1.8	1.4

COURSE PROFILE SEMESTER – IV**Core IV - CORPORATE ACCOUNTING – II****Total Hours: 75****Course Code: 183107****Credits: 4****Course Objectives:**

- To emphasise the accounting procedures of Banks and Insurance Companies

- To elaborate the other related procedures of Amalgamation, Absorption, Reconstruction
- To develop an indepth knowledge in the liquidation procedure

Unit I

Amalgamation and Absorption – Meaning – Purchase Consideration – Computation of Purchase Consideration – Methods of Accounting – Pooling of Interest Method – Purchase Method (Inter Company Holdings, Owings excluded)

15 hours

Unit II

Reconstruction of Companies – Internal and External Construction – Differences – Accounting Problems-

15 hours

Unit III

Liquidation of Companies – Meaning – Types of Winding Up – Statement of Affairs Method – Deficiency Account – Liquidator's Final Statement of Account

15 hours

Unit IV

Final Accounts of Banking Companies including Balance Sheet

15 hours

Unit V

Accounting for Insurance Companies – Life Insurance (as per new format) – Forms – Revenue Account – Profit and Loss Account – Balance Sheet

15 hours

Recommended Text Books:

1. T.S. Reddy & A. Murthy, Corporate Accounting, Margham Publication
2. R.L. Gupta & M. Radhaswamy – Sultan Chand and Sons

Reference Books:

6. Jain & Narang, Corporate Accounting, Kalyani Publishers
7. R. S.N. Pillai & Bagavathy Corporate Accounting- S Chand
8. Dr. R. Rangarajann & Dr. V. Chandrasekaran, Corporate Accounting, S.P. Publications
9. Radhika Raman, Corporate Accounting, McGraw Hill Publications
10. T. Joseph, Corporate Accounting McGraw Hill Publications

Course Outcome:

- To learn the amalgamation absorption procedures
- To teach them the internal and external reconstruction procedures
- To understand the procedure for liquidation and to learn the preparation of final statement of accounts
- To learn the accounting procedures for preparing the final statements of Banking companies
- To know the procedure and preparation of final statement of accounts of insurance companies

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	2	3
CO2	3	1	1	1	3
CO3	3	2	1	2	3
CO4	3	1	1	3	3
CO5	3	3	1	3	3
Average	3	2	1	2.2	3

SEMESTER IV

Core VIII – COMPANY LAW AND SECRETARIAL PRACTICE II

Total Hours: 75

Course Code: 183108

Credits: 4

Course objectives:

- To demonstrate the ways of raising funds for business
- To illustrate the powers of directors and create awareness about the national company law tribunal and corporate governance
- To make them understand the procedures of Board of meeting and payment of Dividend

Unit – I

Methods of raising funds – Powers of the Board and Shareholders – Deposit versus Debentures – Rules and Regulations relating to raising of Funds through Deposits and Debentures – Kinds of Debentures – Creation of Charge – Modification and Satisfaction of Charge – Role and Responsibilities of a Company Secretary – Difference between Share and Debentures and its Holders.

12 hours

Unit – II

Board – Directors – Kinds of Directors – Requirements of a Women Director and Importance of Independent Director – Director Identification Number and its Significance – Qualification and Disqualification – Retirement – Resignation – Removal and Vacation of office of Directors – Duties of Directors – Code of Conduct – Key Managerial Personnel – Whole Time Key Managerial Personnel – Appointment and Remuneration

17 hours

Unit –III

Board Meeting – Committee Meeting – Mandatory Committees and its Importance – Role and Composition – Powers of the Board and Video Conference – Notice – Agenda – Minutes – Role of Company Secretary
Shareholders Meeting – Kinds of Meeting and the compliance of Legal Requirements – Electronic Voting – Postal Ballot – Role of Company Secretary- Rules relating to General Meeting – Kinds of Resolution

17 hours

Unit IV

Declaration and Payment of Dividends and Legal Procedures and Compliance Requirements. Appointment of Auditors – Internal and Branch Audit, Statutory Audit, Secretarial Audit – Importance – Eligibility, Qualification and Disqualifications – Remuneration – Powers and Duties - Prohibited Services – Auditors Report

15 hours

Unit V

Corporate Restructuring – Special Codes – Mediation and Conciliation panel – Class Actions – Modes of winding up – National Company Law Tribunal (NCLT) – Corporate Governance

**14
hours**

Recommended Text Books:

1. N.D. Kapoor, Elements of Co. Law, Sultan Chand Publication
2. P.K.Ghosh, Company Secretarial Practice, S.Chand Publication

Reference Book:

1. M.R. Srinivasan Law, M.R. Srinivasan, Margham Publications
2. Ashok K. Bagrial, Company Law, Vikas Publications
3. Dr. V. Radha, Company Law, Prasanna Publishers and Distributors
4. Gaffoor, Company Law, Vijay Nichole Imprints
5. Alan J. Dignam, John P. Lowry, Company Law, Oxford University

Course Outcome:

- To educate framework of legal procedure of Director duties & Responsibilities
- To impart knowledge about the Role of company secretary .
- Students will be able to improve, develop the knowledge of National company law Tribunal
- Students understand the amendments made in the Companies Act, 2013.
- Students gain an in depth knowledge about the benefits and complexities associated with the company form of organization structure and the role and importance of Company Secretary.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	1
CO2	3	3	1	1	1
CO3	3	3	1	3	1
CO4	3	3	1	3	1
CO5	3	3	3	1	3
Average	3	3	1.4	1.8	1.4

COURSE PROFILE SEMESTER – V**Core IX – MANAGEMENT ACCOUNTING****Total Hours: 90****Credits: 4****Course Code: 183109**

Course objectives:

- To educate the students about the sources and uses of funds
- To enlighten the students about budgeting and its various methods
- To educate the students about managerial decision making

Unit I

Management Accounting – Meaning – Scope – Importance and Limitations – Management Accounting vs Cost Accounting – Management Accounting vs Financial Accounting

18 hours

Unit II

Analysis and Interpretation of Financial Statements – Nature – Objectives and Tools – Methods – Comparative Statements – Common Size Statement and Trend Analysis

18 hours

Unit III

Ratio Analysis – Interpretation – Benefits and Limitations – Classification of Ratios – Liquidity – Profitability – Turnover – Capital Structure and Leverage

18 hours

Unit IV

Fund Flow and Cash Flow Statements – Budget and Budgetary Control – Meaning – Objectives – Merits and Demerits – Types of Budgets – Production, Cash and Flexible Budget

18 hours

Unit V

Marginal Costing (excluding Decision Making) – Absorption Costing and Marginal Costing – CVP Analysis – Break – Even Analysis – Break Even Chart

18 hours

Recommended Text Books:

1. T.S.Reddy & Y.Hariprasad Reddy, Management Accounting, Margham Publications
2. I.M. Pandey, Management Accounting, S. Chand publications

Reference Books:

1. R.S.N.Pillai & Bagavathi, Management Accounting, S.Chand & Company
2. Dr .S .N. Maheswari, Principles of Management Accounting, Sultan chand & Sons
3. S.P.Jain & K.L.Narang, Cost and Management Accounting, Kalyani Chadwick
4. S.P. Iyengar, Cost and Management Accounting, Sultanchand & sons.
5. M.N.Arora, Management Accounting, Vikas Publishing

Course outcome:

- Students are able to apply accounting ratios to extract the financial performance of the firm.
- Students are able to understand the changes in financial position through preparation of Funds Flow and Cash Flow Statements

- Enables to learn the uses of Marginal Costing techniques.
- Enables them to compare financial statements between two or more companies

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	3
CO2	3	3	1	1	3
CO3	3	3	1	1	3
CO4	3	3	1	2	3
CO5	3	3	1	2	3
Average	3	2.8	1	1.4	3

SEMESTER V

Core X - BANKING AND FINANCIAL INSTITUTIONS

Total Hours: 90

Course Code: 183110

Credits: 4

Course Objectives:

- To impart awareness about various types of Banking & Modern Banking Practices
- To provide insight about Financial Institutions
- To give an understanding of the advances available through banks

Unit -I

Introduction to Banking – Origin – Classification of Banks on the basis of Ownership, Kinds, Types and Business – Role of Banks for Economic Development

18 hours

Unit -II

Banker Customer Relationship – Customer - Duration Theory – Relationship as – Debtor and Creditor – Trustee and Beneficiary – Lessor and Lessee – Special Types of Customers – Minor – Married Women

18 hours

Unit –III.

Reserve Bank of India – Origin and Definition – Organisation and Management – Functions of RBI – Commercial Banks – Meaning – Primary Functions – Secondary Functions – Recent Trends – e-Banking – Core Banking – Mobile Banking – Green Banking

18 hours

Unit –IV

Priority Sector Advances – Meaning – Classification of Advances – Areas under Priority Sector – Agriculture Sector – Small Scale Industrial Sector – Small Road and Water Transport Operators – Professionals – Retail Trade – Education Loan – Women Entrepreneurs – Self-Help Groups – Recovery of Loans

18 hours

Unit –V

Financial Institutions – Structure – All India Development Banks – Specialised Financial Institutions – Investment Institutions – Refinance Institutions – State Level Financial Institutions and Others

18 hours

Recommended Text Books:

1. Sundharam Varshney, Banking Theory Law & Practice, 1st Edition , Sultan Chand & Sons.
2. S.S. Gulshan Gulshann K. Kapoor, Banking Law and Practice

Reference Books:

1. S. Natarajan, P. Kandasamy, R. Parameswaran, Banking Law and Practice 4th Edition S. Chand
2. S. Gurusamy, Banking Theory Law & Practice, 3rd Edition, Vijay Nicole
3. M. Radhaswamy, S.V. Vasudevan, S.Chand Co. Pvt. Ltd.
4. N.P. Srinivasan & Saravanavel, Development Banking in India, Kalyani Publishers
5. Prof. C. Vishwanathan, Handbook of Banking Theory Law and Practice, Anuradha Publications.

Course Outcome

- Students understand the meaning of banking and its provision under Banking Regulation Act.
- Students understand the meaning of RBI functions and gain knowledge on primary and secondary functions of commercial banks and modern banking, credit card and debit card.
- Enable the students to understand relationship between Banker and customer.

- Gain knowledge on concepts of Priority sector Advance and areas under priority sector.
- To have the awareness about the role of financial institutions and its support

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	3	2
CO2	3	2	2	3	2
CO3	3	3	3	3	2
CO4	3	3	3	3	2
CO5	3	3	3	3	3
Average	3	3	2.8	3	2.2

SEMESTER V

Core XI – HUMAN RESOURCE MANAGEMENT

Total Hours: 90

Course Code: 183111

Credits: 4

Course Objectives:

- To give an understanding of nature and significance of Human Resources in organisations.
- To provide knowledge about the various mechanisms in HRM
- To impart knowledge of appraisal and job evaluation

Unit I

Nature and scope of HRM – Difference between Personnel Management and HRM

18 hours

Unit II

Human Resource Planning – Recruitment – Selection – Methods of Selection – Use of various Tests – Interview Techniques in Selection – Placement

18 hours

Unit III

Introduction – Training – Needs – Methods – Managerial Training and Employee Training - Techniques – Development

18 hours

Unit IV

Performance Appraisal – Job Evaluation – Performance Appraisal – Methods and Limitations

18 hours

Unit V

Transfer – Promotion and Retirement of Services – Career Development – Mentoring
– Termination

18 hours

Recommended Books:

1. C.B. Gupta, Human Resource Management, Sultan Chand & Sons
2. J. Jayashankar, Human Resource Management, Margam Publications

Reference Book:

5. Dwivedi – Human Relations and organization Behaviour
6. Dr.V.Radha, Human Resource Management, Prasanna Publishers and Distributors
7. Pravin Durai, Human Resource Management, Pearson Publications
8. Mathis, Human Resource Management, Cengage Learning Publication
5. L.M. Prasad, Human Resource Management, Sultan Chand & Sons

Course outcome:

- To acquire knowledge on the concept of Human Resource Management
- Students understand the various sources and methods of recruiting the employees in the organisation
- Students gain knowledge on placement and Training
- To facilitate the knowledge about performance appraisal and different methods.
- To provide an idea about promotion and compensation policy.

Course Mapping

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	3
CO2	2	3	3	3	3
CO3	2	3	3	3	2
CO4	1	3	3	3	2
CO5	1	1	2	2	2
Average	1.6	2.4	2.8	2.8	

SEMESTER – V

Core XII – ENTREPRENEURIAL DEVELOPMENT

Total Hours: 90

Course Code: 183112

Credits:4

Course Objectives:

- To inculcate the spirit of entrepreneurship in the students
- To enhance job creators from mere job seekers
- To enable the students to appraise project based on return and risk

Unit -I

Introduction – Meaning, Need, Role and Importance of Entrepreneurship – Entrepreneur - Characteristics – Classification of Entrepreneurs -Difference between Entrepreneur and Manager - Factors affecting Entrepreneurship

12 hours

Unit -II

Business Idea Generation Techniques – Technical Source – Market Source - Identification of Business opportunities – Sources – Marketing Feasibility – Stages in Product Development – Product Life Cycle – Financial and Economic Feasibility – Methods of Evaluating Financial Feasibility – Sources of Finance- Internal and External Sources of Finance

19 hours

Unit –III

Entrepreneurial Growth – Role of Government and Non – Government Agencies – EDP – KVIC – TCO – SIPCOT- DIC- NSIC – IDBI – ICICI – SFC- LIC

20 hours

Unit –IV

Problems of Entrepreneurs - Women Entrepreneurs – Rural Entrepreneurship – Export Import Procedures – MSME – Role – Sickness in Small Scale Industries – Causes – Role of BIFR

20 hours

Unit –V

Project Appraisal – Introduction – Classification of Projects – Project Life Cycle – Techniques – Pay Back – ROI – DCF – IRR – NPV – PERT and CPM – Project Report – Meaning – Contents – Guidelines for Project Preparation

19 hours

Recommended Text Books:

5. N.P.Srinivasan and C.B.Gupta, Entrepreneurial Development, Sultan Chand & Sons
6. Balraj Singh, Entrepreneurship Development, Wisdom Publications

Reference Book:

9. Dr. Radha and Kathiresan, Entrepreneurial Development, Prasanna Publication
10. Kanka S, Entrepreneurial Development, S.Chand Publishers
11. CS Das Mahabatra, Entrepreneurship-Micro Small and Medium Enterprise, Wisdom Publications
12. G.S. Batra, Development of Entrepreneurship, Deep & Deep Publications
13. Robert.D. Hisrich Michael P.Peter, Dean A. Shepherd, Tata McGraw Hill

Course Outcome:

- To educate conceptual framework of entrepreneur development.
- To impart knowledge about the entrepreneur programmes
- Students will be able to improve,develop the knowledge of identify the business opportunities
- Students understand the various agencies to promote entrepreneurial growth
- Students realize To learn the key processes necessary to bring new product and services to market and key challenges facing by the entrepreneur

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	2	1	3
CO2	1	3	1	1	1
CO3	1	3	2	1	1
CO4	1	3	1	1	2
CO5	1	3	1	1	2
Average	1	3	1.4	1	1.8

SEMESTER V

Elective I – INCOME TAX LAW AND PRACTICE – I

Total Hours: 75
Credits :4

Course Code: 183113

Course Objectives:

- To give an overview of Income Tax Act 1961.
- To enable calculation of income under the head salary, houseproperty and business
- To bring out the role played by the Income Tax Authorities

Unit - I

Basic Concepts of Taxation – Objectives of Taxation – Kinds of Taxes – Definition of Important Terms – Income – Assessment – Assessee – Person – Assessment Year – Previous Year – Heads Of Income – Gross Total Income – Total Income – Residential Status of an Individual and Company

18 hours

Unit - II

Computation of Salary Income – Meaning - Features of Salary – Allowances – Types of Allowances – Perquisites – Kinds of Perquisites – Types of Provident Fund – Gratuity – Commutation of Pension – Deductions from Salary

18 hours

Unit - III

Computation of Income from House Property – Gross Annual Value – Net Annual Value – Computation under Different Circumstances – Let Out – Self Occupied- Deemed to be Let Out - Deductions under Section 24

18 hours

Unit - IV

Profits and Gains of Business and Profession – Allowable Expenses – Disallowed Expenses – General Deductions – Provisions relating to Depreciation – Deemed Business Profits – Undisclosed Income - Computation of Income from Business or Profession

18 hours

Unit - V

Income Tax Authorities – CBDT- Commissioner of Income Tax and Assessing Officer – Appointment – Functions – Control – Jurisdiction – Powers

18 hours

Ratio between Problem and Theory 80:20

Recommended Text Books:

5. T.S. Reddy and Y. Hariprasad Reddy, Income Tax Law and Practice, Margham Publication
6. Gaur & Narang Income Tax, Kalyani Publication

Reference Books

11. Gaur & Narang Income Tax, Kalyani Publication
12. Vinod Singhania, Students Guide to Income Tax and Central Taxes, Taxman Publications
13. Mehrotra & Goyal, Income Tax Law & Accounts, Sathiya Bhavan Publications.
14. Dhinkar Pagare, Income Tax Law and Practice, Sultan Chand Publications
15. C.A. Raj K. Agarwal, Handbook on Income Tax, Bharath Publication

Course Outcome:

- It enables the students to learn about the basic concepts of Income and to determine the residential status of different types of assessee
- Able to apply provisions and to compute income from salary
- Students understand the meaning of gross and net annual value and computation of income from House Property
- Analyse and apply the provisions to calculate business and professional income
- Equip the students about functions, jurisdiction and powers and duties of CBDT and assessing officers of income tax

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	2	3
CO2	3	1	1	1	3
CO3	3	1	1	1	3
CO4	3	3	1	3	3
CO5	3	3	1	3	3
Average	3	2	1	2	3

COURSE PROFILE SEMESTER – VI

Core XIII - INDIRECT TAXATION

Total Hours: 90

Course Code: 183114

Credits: 5

Course Objectives:

- To make the students gain knowledge of the principles of indirect taxes
- To enable the students to gain knowledge of goods and services tax (GST)
- To impart awareness about customs duty

Unit I

History and Objectives of Taxation – Tax Systems in India – Direct and Indirect Taxes – Meaning and Types - – Powers of Union and States to Levy Taxes

12 hours

Unit II

Background behind implementing GST – The need for GST – Business Impact – Benefits of GST – SGST – CGST And IGST – Taxes Covered by GST – Definitions – Scope and Coverage – Scope of Supply – Levy of Tax – Rate Structure – Taxable Events

19 hours

Unit III

Return – Refunds – Input Tax Credit – Reverse Charge Mechanism, Transitional Provisions Composition under GST – Administrative Structure of GST – Officers as Per CGST Act – Officers as Per SGST Act – Jurisdiction – Appointment Powers

20 hours

Unit IV

Assessment and Audit under GST – Demands and Recovery – Appeals and Revision – Advance Ruling Offences and Penalties

20 hours

Unit V

Customs Act, 1962 – Definitions – Objectives – Scope and Coverage of Customs Law – Nature of Customs Duty – Taxable Event for Import Duty – Officers of Customs – Types of Customs Duties – Valuation of Goods for Customs Act – Levy of Duty – Exemptions from Duty – Refund – Recovery of Duties

19 hours

Recommended Text Books:

1. Swetha Jain, GST, Law and Practice, Taxmann Publishers, July 2017
2. V S Datey ,GST, Input Tax Credit, Taxmann Publishers, II Edition August 2017

Reference Books

1. C.A. Anurag Pandey, Law and Practice of GST, Sumedha Publication House, 2017
2. Dr. Vandana Banger , Beginners Guide to GST, Aadhaya Prakashan Publishers, 2017
3. Dr.M. Govindarajan, A Practical Guide to GST,Centax Publishers, July 2017
4. Radha and Parameswaran, Indirect Taxation, Prasanna Publishers
5. T.S. Reddy, Business Taxation, Margham Publications

Course Outcome:

- To educate framework of legal procedure & concept of taxation.
- To impart knowledge about the impact of GST.
- Students will be able to improve,develop the knowledge of identify the modes of custom duty.
- Students understand the instrument of economic policy
- Students realize to learn the progressive tax, regressive tax in a proportional tax provisions

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	3
CO2	3	2	1	1	3
CO3	3	2	1	1	3
CO4	3	1	1	1	3
CO5	3	1	1	1	3
Average	3	1.6	1	1	3

Core XIV – INDUSTRIAL LAW AND PUBLIC RELATIONS

Total Hours: 90

Course Code: 183115

Credits: 5

Course Objectives:

- To acquaint the students with the fundamental principles of Labour laws
- To equip the learners in avoiding conflict with the employer thereby creating a congenial atmosphere in the workplace to promote industrial peace
- To enable an understanding of the role of trade unions and maintaining public relations

Unit I

Factories Act 1948: Definitions – Healthy – Safety – Welfare – Working Hours of Adults – Employment of Women – Employment of young persons – Leave with Wages.

18 hours

Unit II

Payment of Wages Act 1936: Definitions – Responsibilities for Payment – Wages Periods- Time of Payment – Deductions- Claims for Wrongful Deductions. Minimum Wages Act 1948: Interpretation – Fixing Minimum Rate of Wages – Procedures for fixing Wages – Committee and Advisory Boards – Payment of Minimum Wages – Registers and Records – Inspectors – Claims – Penalties and Procedures – The Schedule.

18 hours

Unit III

Industrial disputes Act 1947: Definitions – Authorities under the Act – Reference of Disputes – Procedures and Powers of Authorities – Strikes and Lockouts – Layoff – Retrenchment – Special Provisions relating to Layoff – Retrenchment and Closure. Special Provisions as to Restarting an Undertaking – Penalties – Miscellaneous – Repeal of the Act 1950.

18 hours

Unit IV

Role of Trade Unions – Collective Bargaining – Employees Grievances and Redressal – Methods and Procedures

18 hours

Unit V

Public Relations – Concept – Definition – Scope – Elements – Objectives – Functions – Public Relations for Education and Training – Media – Public Relations and Press – Radio – Audio Visual Media – News and Features – Press in India.

18 hours

Recommended Text Books:

1. N.D Kapoor, Industrial Law, Sultan Chand
2. M.R. Srinivasan, Labour Legislation, Margham Publications

Reference Books:

1. Mamoria and Tripathi, Personnel Management and Industrial Relations, Sultan Chand
2. VN Parthiban, Industrial and Labour laws, Srimurthy Pathipagam
3. Kapoor, Handbook of Industrial Law, Sultan Chand Publications
4. Nandakumar, Industrial law, Vijay Nichole Imprints
5. C.B. Mamoria, Dynamics of Industrial relations, Himalayan Publishing House

Learning Outcome:

- Students understand the provisions relating to health, safety and welfare under factories act
- To learn the provisions relating to delay in the payment of wages and to prevent unauthorised deductions from wages
- To acquaint the students with the concept and the meaning of settlements, strikes and lockouts, layoff, retrenchment and closures
- To get acquainted with the principles of Trade unions
- To understand the various process and procedures relating to public relations

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	1	2
CO2	3	2	1	1	2
CO3	3	2	1	1	2
CO4	3	2	1	1	2
CO5	3	2	2	2	2
Average	3	2	1.2	1.2	2

SEMESTER VI**Elective II - COST ACCOUNTING****Total Hours: 90****Course Code: 183117****Credits: 5****Course Objectives:**

- To give a comprehensive understanding of cost concepts
- To enable understanding of the elements of cost
- To enable an understanding of applications of cost concepts in Industries

Unit -I

Cost Accounting – Definition – Meaning and Objectives – Advantages and Importance
– Elements of Cost – Preparation of Cost Sheets and Tenders -

18 hours

Unit -II

Materials – Bin Card – Stores Ledger – Inventory Control – ABC Analysis – Economic Ordering Quantity – Maximum, Minimum and Reordering levels – Methods of Pricing – Actual Cost Methods (LIFO, FIFO, BSM and HIFO) – Average Cost Methods (SACM and WACM) – Issues - Perpetual Inventory system.

25 hours

Unit -III

Labour Cost- Methods of Remuneration – Incentive Scheme – Time Rate and Piece Rate System – Taylor – Merrick – Halsey – Rowan.

20 hours

Unit -IV

Overheads – Factory, Administration and Selling – Allocation, Apportionment and Absorption – Machine Hour Rate

15 hours

Unit -V

Process Costing – Meaning , Features, Types of Industries using Process Costing , Advantages and Disadvantages of Process Costing, Process Losses – Normal loss, Abnormal loss and Abnormal Gain (Excluding Inter Process Profit and Equivalent Production)

20 hours

Ratio between Problem and Theory 80:20

Recommended Books:

1. T.S. Reddy and Y. Hariprasad Reddy, Cost Accounting, Margham Publications
2. S.P. Jain and K.L. Narang, Cost Accounting, Kalyani Publishers

Reference Books:

1. M. N. Arora, Cost and Management Accounting, Vikas publicationns
2. Dr. S.N. Maheshwari, Principles of Cost Accounting, Sultan Chand & Sons
3. R.S.N. Pillai and V. Bagavathi, Cost Accounting, S.Chand
4. S.P. Iyengar, Cost and Management Accounting, Sultanchand & Sons
5. P.T. PattanChetty, D.R. Palekar, Cost Accounting, R. Chand & Co.

Course outcome:

- To understand the components of cost and to frame the cost sheet for tenders and quotations
- To learn the accounting treatment regarding reduce and control the cost of materials
- To understand the essence of labour cost and its treatment
- To get wider knowledge about overhead treatment and its absorption in various departments

- To understand the accounting treatment in process costing, job costing oriented industries

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	1	3
CO2	3	3	3	1	1
CO3	3	2	3	1	1
CO4	3	3	1	1	2
CO5	3	3	3	1	2
Average	3	3	2.4	1	1.8

SEMESTER VI

Elective III – INCOME TAX LAW AND PRACTICE – II

Total Hours: 75

Course Code: 183118

Credits: 5

Course Objectives:

- To enable the students to compute the gross total income and the tax liability
- To educate them about the deduction to be claimed from total income
- To enable calculation of tax liability for individuals

Unit - I

Capital Gains – Definition of Capital Asset – Computation of Capital Gains – Long and Short Term – Transfer – Cost of Acquisition – Cost of Improvement –Exempted Capital Gain

18 hours

Unit - II

Income from Other Sources – Deduction – Dividends – Interest on Securities – Bond Washing Transactions – Sale of cum Interest Securities – Casual Income - and other Relevant Provisions - Computation

18 hours

Unit – III

Set Off and Carry Forward of Losses – Provisions – Computation – Clubbing of Income – Negative Income – Deemed Income – Provisions - Computation

18 hours

Unit - IV

Assessment of Individuals – Deduction allowable from Gross Total Income (80C, 80CCC, 80CCD, 80CCD1B, 80CCE, 80CCG, 80D, 80DD, 80DDB, 80E, 80G, 80GG, 80GGA, 80GGB, 80GGC, 80QQB, 80RRB, 80TTA and 80U) - Computation of Tax Liability.

18 hours

Unit - V

Deduction of Tax at Source – Advance payment of Tax – Permanent Account Number (theory only) – Procedure for Assessment–Filing of Return – Voluntary Return-Revised Return – Defective Return – Self Assessment – Summary Assessment – Scrutiny Assessment – Best Judgment Assessment.

Ratio between Problem and Theory 80:20

Recommended Text Books:

3. T.S. Reddy and Y. Hariprasad Reddy, Income Tax Law and Practice, Margham Publication
4. Gaur & Narang Income Tax, Kalyani Publication

Reference Books

6. Gaur & Narang Income Tax, Kalyani Publication
7. Vinod Singhania, Students Guide to Income Tax and Central Taxes, Taxman Publications
8. Mehrotra & Goyal, Income Tax Law & Accounts, Sathiya Bhavan Publications.
9. Dhinkar Pagare, Income Tax Law and Practice, Sultan Chand Publications
10. C.A. Raj K. Agarwal, Handbook on Income Tax, Bharath Publication

Course Outcome:

- Students understand to identify the types of Assets and to compute Long term and Short term Capital Gain and able to apply the deductions.
- To enlighten the concepts of income from sources and to enable them to compute
- Enabling the students to have a detailed idea on set off and carry forward of income and clubbing of income and computation thereof
- Able to compute the tax liability of an individual and understand the application of provisions for deduction under section 80
- To acquire knowledge about PAN and time limit for filing returns

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	1	3
CO2	3	3	1	1	3
CO3	3	3	1	1	3
CO4	3	3	1	1	3
CO5	3	3	1	1	3
Average	3	3	1	1	3

PROGRAMME SPECIFIC OUTCOMES

1. To inculcate self-confidence for the students to face interviews.
2. To have enough power and vision to project in advance as to what outcome shall result and achieve success in work place.
3. To inculcate behavioural values that involves good manners required to make life successful.
4. To help elderly and handicapped people to have happier life by creating helping tendency in student's minds.
5. To have faith in fundamental Human Rights, Promote and Ensure individual and collective well-being.

SEMESTER VI**VALUE EDUCATION****Total Hours: 30****Credits: 2****Course Code:****Course Objectives:**

- To develop positive thinking and change of attitude
- To transform in order to shine, succeed and aim to become an achiever
- To provide basic ethics and educate on human values essential for character-building in life

Unit I

“Building Self-Confidence” by Norman Vincent Peale.

Unit II

“Living Excellence” by Anthony Robbins.

Unit III

“Kinds of Values” by Ignachimuthu. S. J.

Unit IV

“What is Ethics?” by Swami Vivekananda.

Unit V

“Essential Characteristics of Human Rights by H.Victor Gonde.

Content and Treatment as in

1. Touchstone: Synergy of values

Course Outcomes:

1. Building Self- Confidence and Positive Thinking.
2. Realise the quality of life and aim to be an achiever in life.
3. Understand the importance of personal, social, moral, spiritual and behavioural values.
4. Understand basic ethics and follow certain moral principles.
5. Understand Human Rights and its characteristics.

Course Mapping:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	3	3	3	3	2
CO3	3	3	3	3	3
CO4	3	2	3	2	2
CO5	3	3	2	2	3
AVERAGE	3	2.6	2.6	2.4	2.8