

**D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS),  
VELLORE – 1**

**MEETING OF THE XIV ACADEMIC COUNCIL**

**DATE: 10.06.2019**

**TIME : 10.30 AM**

**VENUE: IQAC MINI**

**CONFERENCE HALL**

**AGENDA**

1. Prayer

2. Welcome address and Introductory Remarks by the Principal

**Agenda No.1**

To seek approval for the minutes of the previous academic council meeting held on 18.02.2019.

**Agenda No.2**

To seek approval to introduce the new syllabi based on outcome based curriculum model from the academic year 2019-2020 onwards for all the UG and PG courses as suggested in the XIII academic council meeting.

**Agenda No.3**

To seek approval for the same syllabi of foundation English papers for I, II, III, & IV Semesters for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.4**

To seek approval for the Templates prepared for B.A. English and M.A. English courses, for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.5**

To seek approval for the syllabi framed for I & II Semester of B.A. English and I & II Semesters of M.A. English courses, for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.6**

To seek approval for adopting the same syllabi of 2015-2016 for foundation Tamil, Hindi, Urdu & French papers for I, II, III, & IV Semesters for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.7**

To seek approval for the Templates prepared for B.A. Tamil course for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.8**

To seek approval for the syllabi framed for I & II Semesters of B.A. Tamil course, for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.9**

To seek approval for the Templates prepared for B.A. History and M.A. History courses, for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.10**

To seek approval for the syllabi framed for I & II Semesters of B.A. History and I & II Semesters M.A. History courses for those students admitted from the academic year 2019-2020 onwards..

**Agenda No.11**

To seek approval for the Templates prepared for B.Com, and M.Com courses, for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.12**

To seek approval for the syllabi framed for I & II Semesters of B.Com and I & II Semesters of M.Com courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.13**

To seek approval for the Templates prepared for B.Com. (CA) courses, for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.14**

To seek approval for the syllabi framed for I & II Semesters of B.Com. (CA) courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.15**

To seek approval for the Syllabi framed for allied Economics papers offered by the Department of Economics for I and II semesters of I-B.Com, I-B.Com.(C.A) and M.Com courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.16**

To seek approval for the Templates prepared for B.Sc. Mathematics and M.Sc. Mathematics courses, for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.17**

To seek approval for the syllabi framed for I & II Semesters of B.Sc. Mathematics and I & II Semesters of M.Sc. Mathematics courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.18**

To seek approval for the Templates prepared for B.Sc. Chemistry and I & II Semesters of M.Sc. Chemistry courses, for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.19**

To seek approval for the syllabi framed for I & II Semesters of B.Sc.Chemistry and I & II Semesters of M.Sc. Chemistry courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.20**

To seek approval for the Syllabi prepared for allied Physics papers offered by the Physics department for I and II semesters of B.Sc. Chemistry and B.Sc. Mathematics courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.21**

To seek approval for the Templates prepared for B.Sc. Zoology and M.Sc. Zoology for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.22**

To seek approval for the syllabi framed for I & II Semesters of B.Sc. Zoology and I & II Semesters of M.Sc. Zoology courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.23**

To seek approval for the Templates prepared for B.Sc. Biochemistry and to follow the same syllabi of M.Sc. Biochemistry for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.24**

To seek approval for the syllabi framed for I & II Semesters of B.Sc. Biochemistry and I & II Semesters of M.Sc. Biochemistry courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.25**

To seek approval for the Templates prepared for B.Sc. Biotechnology and M.Sc. Biotechnology for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.26**

To seek approval for the syllabi framed for I & II Semesters of B.Sc. Biotechnology and I & II Semesters of M.Sc. Biotechnology courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.27**

To seek approval for the Templates prepared for B.Sc. Microbiology and M.Sc. Applied Microbiology for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.28**

To seek approval for the syllabi framed for I & II Semesters of B.Sc. Microbiology and I & II Semesters of M.Sc. Applied Microbiology courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.29**

To seek approval for the Templates prepared for B.Sc. Foods service Management and Dietetics and M.Sc. Food and Nutrition for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.30**

To seek approval for the syllabi framed for I & II Semesters of B.Sc. Foods service Management and Dietetics and I & II Semesters of M.Sc. Food and Nutrition courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.31**

To seek approval for the Templates prepared for B.Sc. Computer Science, B.C.A and M.Sc. Computer Science courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.32**

To seek approval for the syllabi framed for I & II Semesters of B.Sc. Computer Science, B.C.A and I & II Semesters of M.Sc. Computer Science courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.33**

To seek approval for the Templates prepared for B.Sc. ISM, B.B.A and M.A.HRM courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.34**

To seek approval for the syllabi framed for I & II Semesters of B.Sc. ISM, B.B.A and I & II Semesters of M.A.HRM courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.35**

To seek approval for the Templates prepared for B.Sc. Psychology courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.36**

To seek approval for the syllabi framed for I & II Semesters of B.Sc. Psychology courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.37**

To seek approval to introduce optional online course 1 to 3 extra credits during odd semesters for PG Courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.38**

To seek approval to introduce self study paper with 1 to 3 extra credits during the odd semesters for PG courses for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.39**

To seek approval for the compulsory papers, Environmental studies (I Semester) and Value Education (II Semester) for those students admitted from the academic year 2019-2020 onwards.

**Agenda No.40**

To seek approval to continue optional “Internship training” in the IV semester during summer vacation to all UG course and II Semester during for all PG course with an extra credit of 1 to 3 for the students admitted from the academic year 2019-2020.

**Agenda No.41**

To seek approval to continue optional “Mini Project” to all UG course in the IV Semester for those students admitted from the academic year 2019-2020 with extra credits of 1 to 3.

**Agenda No.42**

To discuss and to decide any other matter pertaining to academic issues.

## **SYLLABUS FOR FOUNDATION ENGLISH**

### **FOUNDATION ENGLISH**

#### **SEMESTER-I**

##### **UNIT-I**

1. Kamala Das: My Grandmother's House
2. Wislawa Szymborska: Love at First Sight

##### **UNIT-II**

1. Rajinder Singh Bedi: Lajwanti
2. Ismat Chughtai: Childhood

##### **UNIT-III**

1. Moti Nandy: Umpiring
2. Julie Sahni: South Indian Coffee with Amma

##### **UNIT-IV**

1. V.Raghunathan Excerpts : A Scientific Religion
2. Nero's Guests : Watching Documentary
3. Learning English Through Stories : Beauty and The Beast

##### **UNIT-V GRAMMAR**

1. Common Errors in English
2. Tenses
3. Verbs
4. Active and Passive Voices
5. Subject-verb Agreement

##### **PRESCRIBED TEXT**

Life scripts: English for undergraduates. Hyderabad: Orient Blackswan Pvt. Ltd., 2015. Print.

#### **SEMESTER-II**

##### **UNIT-I**

1. Ayyappa Panicker: Casabianca
2. Anna Akhmatova: Song of the Last Meeting
3. Yehuda Amichai: The Diameter of the Bomb

##### **UNIT-II**

1. Ashoka Mitran : The Rat
2. Ravi Sastry: Rain

### **UNIT-III**

1. Anna Sewell: A London Can Horse
2. Shankarrao Kharat : A Corpse in the Well

### **UNIT-IV**

1. Roman Polanski: The Pianist
2. Learn English through Stories : The Dancing Men

### **UNIT-V**

1. Idioms
2. Prepositions
3. Phrasal Verbs
4. Letters
5. Precis Writing
6. Emails
7. Conversational Strategies

### **PRESCRIBED TEXT**

Life scripts: English for undergraduates. Hyderabad: Orient Blackswan Pvt. Ltd., 2015. Print.

### **SEMESTER-III**

#### **UNIT-I**

1. Arraignment Of The Men: Sor Juana Ines De La Cruz(Translated By Peter H. Goldsmith)
2. Birches: Robert Frost

#### **UNIT-II**

1. The Cactus: Hasan Manzar(Translated By Faruq Hassan)
2. A Passion In The Desert: Honore' De Balzac(Translated By Ernest Dowson)

#### **UNIT-III**

1. The Boarded Window: Ambrose Bierce
2. A Chameleon: Anton Chekhov

#### **UNIT-IV**

1. R.M.S Titanic: Hanson W. Baldwin
2. The False Gems: Guy De Maupassant

#### **UNIT-V GRAMMAR**

1. Countable, Uncountable And Proper Nouns
2. Possessive, Gender And Collective Nouns
3. Main Verbs, Auxiliary Verbs
4. Negatives

5. Yes-No Questions
6. Wh-Questions
7. Question Tags
8. Adjectives And Their Order
9. Degrees Of Adjectives
10. Direct To Indirect Speech(1,2,3)

## **SOFT SKILLS**

### **UNIT I- INTRODUCTION TO SOFT SKILLS**

Definition of soft skills  
Need for soft skills  
Nature and scope of soft skills  
Acquiring soft skills  
Advantages of soft skills

### **UNIT II- COMMUNICATION SKILLS**

Types of communication  
Forms (modes) of communication  
Spoken communication  
Written communication  
Non-verbal communication  
Barriers to communication  
Linguistic skills  
Listening, speaking, reading and writing(LSRW)  
Body language

### **UNIT III- SOFT SKILLS**

Critical, creative and positive thinking  
Leadership, assertive and negotiation skills  
Stress management and time management  
Self management  
Building relationship skills  
Problem-solving skills  
Effective teamwork skills

### **UNIT- IV -PERSONALITY DEVELOPMENT**

Meaning of personality  
Role of biological and social factors in forming personality  
Personality traits  
Motivation, awareness, creativity, punctuality  
Teaching personality development

### **UNIT V – VALUES**

Meaning of values  
Importance of values  
Kinds of values  
Concept of morality, character, duty and virtue



How to cultivate values

## **UNIT VI- ATTITUDE**

Positive attitude

Negative attitude

Neutral attitude

Other attitude

Formation of attitude

Components of attitude: emotional, behavioural, cognitive

Functions of attitude

## **PRESCRIBED TEXT**

Ajay R. Tengse. *Soft skills: A textbook for undergraduates*. Hyderabad: Orient Blackswan Pvt. Ltd., 2015. Print.

## **PRESCRIBED TEXT**

Life scripts: English for undergraduates. Hyderabad: Orient Blackswan Pvt. Ltd., 2015. Print.

Raj N Bakshi. English Grammar Practice. Hyderabad: Orient Blackswan Pvt. Ltd., 2005. Print.

## **SEMESTER-IV**

### **UNIT-I**

An Astrologer's Day -----R. K. Narayan

1. Prefixes
2. Parts of speech
3. Nouns
4. Pronouns
5. Articles
6. Sentence structures

### **UNIT-II**

Building a New State---- A.P.J Abdul Kalam

1. Homophones
2. Homographs
3. Homonyms
4. Synonyms and antonyms
5. Commonly confused words
6. Finite verbs
7. Non-finite verb forms
8. Question
9. Making requests, interrupting, apologising and making polite conversation

### **UNIT-III**

Water: The Elixir Of Life ---- C.V. Raman

1. One-word substitutes
2. Tenses
3. Giving directions and instructions, making suggestions, offering advice, and agreeing and disagreeing
4. Official letters
5. Curricula vitae
6. Covering letters

#### **UNIT-IV**

The Woodrose ---- Abburi Chaya Devi

1. Phrasal verbs
2. Idioms
3. Active and Passive voice
4. Prepositions
5. Official reports
6. Technical reports
7. Information transfer

#### **UNIT-V**

Progress: St. John Ervine

1. Collocations
2. Technical vocabulary
3. Common vocabulary errors
4. Conjunctions
5. Presentations
6. Group discussions
7. Emails

#### **PRESCRIBED TEXT**

Board of Editors. Using English: A Coursebook for Undergraduate Learners. Hyderabad: Orient Blackswan Pvt. Ltd., 2014. Print.

#### **DEPARTMENT OF ENGLISH-UG**

#### **PROGRAMME EDUCATIONAL OBJECTIVES (PEO)**

Under graduates of B.A. Programme will be

**PEO1:** Utilizing their strong domain knowledge in English language and literature to develop and create contents for the upliftment of the individual and society.

**PEO2:** Applying research skills and entrepreneurial skills with a rich set of communication, teamwork and leadership skills to excel in their profession.

**PEO3:** Showing a lifelong learning ability appreciating human values, cultural and ethical values.

**PROGRAMME OUTCOMES (PO):**

On completion of B.A.English Literature programme, the students are expected to

**PO1:** Understand the versatility and range of knowledge in the various periods of English language and literature.

**PO2:** Identify the transitions in the various ages of English Language and Literature and analyze the influence of new theories in their development.

**PO3:** Create, select, adapt and apply appropriate theories and resources to understand the complex texts in literature with an understanding of its limitations.

**PO4:** Understand and assess individual, social, environmental, cultural issues and the responsibilities relevant to their knowledge.

**PO5:** To acquire the four basic language skills LSRW and have practical competency in English Language. Communicate effectively with society at large, comprehend and write effective reports, make presentation, give clear instructions and teach.

**BA [ENGLISH] CBCS SYLLABUS**

**THE COURSE OF STUDY AND THE SCHEME OF EXAMINATION**

|                    | PART | STUDY COMPONENTS<br>COURSE TITLE | INS.HRS/ WEEK | CREDITS | TITLE OF THE PAPER        | CIA | UNIV EXAM | TOTAL |
|--------------------|------|----------------------------------|---------------|---------|---------------------------|-----|-----------|-------|
| <b>SEMESTER- I</b> |      |                                  |               |         |                           |     |           |       |
| 1                  | I    | Language – I                     | 6             | 4       | Tamil – I/ Other Language | 25  | 75        | 100   |
| 2                  | II   | English Paper – I                | 6             | 4       | English Paper –I          | 25  | 75        | 100   |
| 3                  | III  | Core Paper – I                   | 5             | 3       | British Fiction           | 25  | 75        | 100   |
| 4                  | III  | Core Paper –                     | 4             | 4       | British Poetry            | 25  | 75        | 100   |

|                      |     |                       |    |    |                                   |     |     |     |
|----------------------|-----|-----------------------|----|----|-----------------------------------|-----|-----|-----|
|                      |     | II                    |    |    |                                   |     |     |     |
| 5                    | III | Allied Paper – I      | 7  | 5  | Literary Forms & Terms            | 25  | 75  | 100 |
| 6                    | IV  | Environmental Studies | 2  | 2  | Environmental Studies             | 25  | 75  | 100 |
|                      |     |                       | 30 | 22 |                                   | 150 | 450 | 600 |
| <b>SEMESTER- II</b>  |     |                       |    |    |                                   |     |     |     |
| 1                    | I   | Language – II         | 6  | 4  | Tamil –II/Other Language          | 25  | 75  | 100 |
| 2                    | II  | English Paper – II    | 4  | 4  | English Paper-II                  | 25  | 75  | 100 |
| 3                    | III | Core Paper – III      | 4  | 3  | American Literature               | 25  | 75  | 100 |
| 4                    | III | Core Paper – IV       | 4  | 3  | Indian Writing In English         | 25  | 75  | 100 |
| 5                    | III | Allied Paper – II     | 7  | 5  | Socio-Cultural History Of England | 25  | 75  | 100 |
| 6                    | IV  | Value Education       | 3  | 2  | Value Education                   | -   | 50  | 50  |
| 7                    | IV  | Soft Skills           | 2  | 1  | Soft Skills                       | -   | 50  | 50  |
|                      |     |                       | 30 | 22 |                                   | 125 | 475 | 600 |
| <b>SEMESTER- III</b> |     |                       |    |    |                                   |     |     |     |
| 1                    | I   | Language – III        | 6  | 4  | Language- III /Other Language     | 25  | 75  | 100 |
| 2                    | II  | English paper – III   | 6  | 4  | English Paper-III                 | 25  | 75  | 100 |
| 3                    | III | Core – V              | 4  | 4  | British Prose                     | 25  | 75  | 100 |
| 4                    | III | Core – VI             | 3  | 3  | British Drama                     | 25  | 75  | 100 |
| 5                    | III | Allied – III          | 7  | 5  | History of English Literature     | 25  | 75  | 100 |
| 6                    | IV  | Skill Based – I       | 2  | 2  | Basics of English Grammar         | -   | 50  | 50  |
| 7                    | IV  | Non Major – I         | 2  | 2  | English For Communication         | -   | 50  | 50  |
|                      |     |                       | 30 | 24 |                                   | 125 | 475 | 600 |
| <b>SEMESTER- IV</b>  |     |                       |    |    |                                   |     |     |     |
| 1                    | I   | Language – IV         | 6  | 4  | Language – IV/Other Language      | 25  | 75  | 100 |
| 2                    | II  | English paper – IV    | 6  | 4  | English Paper – IV                | 25  | 75  | 100 |

|                    |     |                  |    |    |   |     |     |     |
|--------------------|-----|------------------|----|----|---|-----|-----|-----|
| 3                  | III | Core – VII       | 4  | 3  | World Classics  | 25  | 75  | 100 |
| 4                  | III | Core – VIII      | 3  | 4  | Literary Criticism                                      | 25  | 75  | 100 |
| 5                  | III | Allied – IV      | 7  | 5  | History of English Literature-II                        | 25  | 75  | 100 |
| 6                  | IV  | Skill Based – II | 2  | 2  | English Language Skills For Employability               | -   | 50  | 50  |
| 7                  | IV  | Non Major – II   | 2  | 2  | English For Competitive Exams                           | -   | 50  | 50  |
|                    |     |                  | 30 | 24 |   | 125 | 475 | 600 |
| <b>SEMESTER- V</b> |     |                  |    |    |   |     |     |     |
| 1                  | I   | Core –IX         | 6  | 3  | Shakespeare   | 25  | 75  | 100 |
| 2                  | II  | Core – X         | 5  | 4  | History of English Language & Linguistics               | 25  | 75  | 100 |
| 3                  | III | Core – XI        | 5  | 4  | Post-Colonial Literature                                | 25  | 75  | 100 |
| 4                  | III | Core – XII       | 6  | 4  | Literary Criticism-II                                   | 25  | 75  | 100 |
| 5                  | III | Elective – I     | 3  | 3  | a. Regional Literature (or)<br>b. Translation Studies   | 25  | 75  | 100 |
| 6                  | IV  | Elective – II    | 3  | 3  | a.Women's Writing (or)<br>b. Afro - American Literature | 25  | 75  | 100 |
| 7                  | IV  | Skill Based III  | 2  | 2  | Personality Development                                 | -   | 50  | 50  |
|                    |     |                  |    |    |   | 150 | 500 | 650 |
| <b>SEMESTER-VI</b> |     |                  |    |    |   |     |     |     |
| 1                  | I   | Core – XIII      | 5  | 3  | ELT   | 25  | 75  | 100 |
| 2                  | II  | Core – XIV       | 5  | 4  | Modern English Grammar                                  | 25  | 75  | 100 |
| 3                  | III | Core – XV        | 6  | 4  | Contemporary Critical Theory                            | 25  | 75  | 100 |
| 4                  | III | Core – XVI       | 6  | 3  | European  | 25  | 75  | 100 |

|   |     |                      |    |    |   |     |     |     |
|---|-----|----------------------|----|----|---|-----|-----|-----|
|   |     |                      |    |    | Drama   |     |     |     |
| 5 | III | Elective – III       | 3  | 3  | a. Cultural Studies<br>(or)<br>b. Media Studies             | 25  | 75  | 100 |
| 6 | IV  | Elective – IV        | 3  | 3  | a. Diasporic Literature<br>(or)<br>b. Children's Literature | 25  | 75  | 100 |
| 7 | IV  | Skill Based IV       | 2  | 2  | Journalism  | -   | 50  | 50  |
|   |     | Extension Activities | -  | 3  |   | 100 | -   | 100 |
|   |     |                      | 30 | 25 |   | 250 | 500 | 750 |

### CONSOLIDATED STATEMENT

| PART     | SUBJECT                | PAPERS | HOURS | CREDITS          | TOTAL CREDITS | MARKS | TOTAL MARKS |
|----------|------------------------|--------|-------|------------------|---------------|-------|-------------|
| Part-I   | Language               | 4      | 24    | 4                | 16            | 100   | 400         |
| Part-II  | English                | 4      | 22    | 4                | 16            | 100   | 400         |
| Part III | Allied (Odd Semester)  | 2      | 14    | 5                | 10            | 100   | 200         |
|          | Allied (Even Semester) | 2      | 14    | 5                | 10            | 100   | 200         |
|          | Elective               | 4      | 12    | 3                | 12            | 100   | 400         |
|          | Core                   | 16     | 75    | 8x4=32<br>8x3=24 | 56            | 100   | 1600        |
| Part-IV  | Environmental Studies  | 1      | 2     | 2                | 2             | 100   | 100         |
|          | Soft Skills            | 1      | 2     | 1                | 1             | 50    | 50          |
|          | Value Education        | 1      | 3     | 2                | 2             | 50    | 50          |
|          | Language and Other/NME | 2      | 4     | 2                | 4             | 50    | 50          |
|          | Skill Based            | 4      | 8     | 2                | 8             | 50    | 50          |

|        |                      |   |            |   |            |     |             |
|--------|----------------------|---|------------|---|------------|-----|-------------|
| Part-V | Extension Activities | 1 | -          | 3 | 3          | 100 | 100         |
|        | <b>Total</b>         |   | <b>180</b> |   | <b>140</b> |     | <b>3600</b> |

### BRITISH FICTION

| Sem      | Sub Code | Category            | Lecture  |           | Theory   |           | Practical | Credit   |
|----------|----------|---------------------|----------|-----------|----------|-----------|-----------|----------|
|          |          |                     | Hrs      | Hrs       | Hrs      | Hrs       |           |          |
|          |          |                     | P/W      | P/Sem     | P/W      | P/Sem     |           |          |
| <b>I</b> |          | <b>Core Paper-I</b> | <b>5</b> | <b>75</b> | <b>5</b> | <b>75</b> | <b>-</b>  | <b>3</b> |

### COURSE OBJECTIVES:

- To Enable the Students to understand the various facets of British Fiction.
- To Enable the Students to understand the evolution of the English novel.

### COURSE OUTCOMES:

On the successful completion of the course students will be able to,

| CO Number | CO Statement   | Knowledge Level (K1-K5)                    |
|-----------|--|--|
| CO1       | Know, define and remember the different types of novels, plot construction, characterization, settings, narration and other important elements and techniques of novels in English literature. | <b>K1</b><br><b>Remember</b>               |
| CO2       | Recognize and understand the diversity of culture and context in the works of fiction thereby developing sensitivity to nature and fellow human beings.  | <b>K2</b><br><b>Understand</b>             |
| CO3       | Interpret the works of fiction and execute the life lessons learned in everyday situations demonstrating a better human personality.   | <b>K3</b><br><b>Apply</b>                  |
| CO4       | Analyze the text as an expression of human values within historical and social context. Develop critical thinking through close reading of literary texts.                                     | <b>K4</b><br><b>Analyze&amp; Synthesis</b> |
| CO5       | Identify and create a basic model in different kinds of novels & fictions such as war, romance, fantasy, epistolary etc.   | <b>K5&amp;K6</b><br><b>Evaluate &amp;</b>  |

### MAPPING WITH PROGRAMME OUTCOMES

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | M          | S          |
| <b>CO2</b> | S          | S          | M          | S          | M          |
| <b>CO3</b> | M          | M          | S          | S          | M          |
| <b>CO4</b> | M          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | M          | S          |

***S- Strong;***

***M – Medium***

## **SYLLABUS**

### **UNIT –I**

**15 Hrs**

Rise of the Novel  
 Elements of Novel  
 Plot, Characterization  
 Narrative Technique and Structure  
 Picaresque Novel  
 Historical Novel  
 Gothic Novel  
 Epistolary Novel  
 Regional Novel  
 Detective Novel  
 Science Fiction  
 Meta-fiction  
 Pulp Fiction

### **UNIT – II**

**15 Hrs**

Samuel Richardson- Pamela  
 Henry fielding - Joseph Andrews

### **UNIT- III**

**15 Hrs**

Daniel Defoe- Robinson Crusoe  
 Jane Austen- Pride and Prejudice

### **UNIT- IV**

**15 Hrs**

Sir Walter Scott- Ivanhoe  
 Charles Dickens-David Copperfield

### **UNIT – V**

**15 Hrs**

Thomas Hardy-The Mayor of Casterbridge  
 George Orwell- Animal Farm

**Total Hours:75**



## TEACHING METHODOLOGY Classroom Lectures

- PowerPoint
- Screening Movies
- Seminars
- Assignments, Tests

### TEXT BOOKS:

| S.NO | Authors           | Title                     | Publishers              | Year of Publication |
|------|-------------------|---------------------------|-------------------------|---------------------|
| 1    | Samuel Richardson | Pamela                    | Dover                   | 2015                |
| 2    | Henry fielding    | Joseph Andrews            | Rupa& Co                | 2013                |
| 3    | Daniel Defoe      | Robinson Crusoe           | Fingerprint             | 2013                |
| 4    | Jane Austen       | Pride and Prejudice       | Fingerprint             | 2017                |
| 5    | Sir Walter Scott  | Ivanhoe                   | CreateSpace Independent | 2017                |
| 6    | Charles Dickens   | David Copperfield         | Penguin                 | 2004                |
| 7    | Thomas Hardy      | The Mayor of Casterbridge | Penguin                 | 2003                |
| 8    | George Orwell     | Animal Farm               | Penguin                 | 2011                |

### REFERENCE BOOKS:

| S.NO | Authors                      | Title  | Publishers     | Year of Publication |
|------|------------------------------|--|----------------|---------------------|
| 1    | Kumar, Shiv K. & Keth Mckean | Critical Approaches to Fiction.                                | Atlantic       | 2014                |
| 2    | Head, Dominic                | The Cambridge Introduction to Modern British Fiction 1950-2000 | Cambridge      | 2005                |
| 3    | Abrams, M.H                  | A Glossary of Literary Terms. 7th ed.                          | Harcourt India | 2001                |

### WEB SOURCES:

1. <https://englishsummary.com/robinson-crusoe-summary-analysis/>
2. <https://schoolworkhelper.net/henry-fieldings-joseph-andrews-summary-analysis/>
3. <https://classycoquettes.wordpress.com/2017/10/30/an-analysis-of-pamela-or-virtue-rewarded-by-samuel-richardson/>
4. <https://schoolworkhelper.net/jane-austens-pride-and-prejudice-summary-analysis/>
5. <http://www.novelguide.com/>
6. <http://www.bibliomania.com/>
7. <http://www.english-lecturer.com/>

### COURSE DESIGNERS

1. Ms.V.P.Gayathri

Head & Asst.Prof in English

2. Mrs.R. Sarathy

Asst. Prof in English

3. Ms.C.Sharmila

Asst. Prof in English

### BRITISH POETRY

| Sem | Sub Code | Category      | Lecture |           | Theory  |           | Practical | Credit |
|-----|----------|---------------|---------|-----------|---------|-----------|-----------|--------|
|     |          |               | Hrs P/W | Hrs P/Sem | Hrs P/W | Hrs P/Sem |           |        |
| I   |          | Core Paper-II | 4       | 60        | 4       | 60        | -         | 4      |

#### COURSE OBJECTIVES:

- To provide the students with the basic knowledge of the evolution of English and historic periods.
- To educate students on the nuances of the poetry writing.
- To enable them to understand the thought and imagination contained in the poem.

#### COURSE OUTCOMES:

On the successful completion of the course students will be able to,

| CO Number | CO Statement   | Knowledge Level (K1-K5)                |
|-----------|--|--|
| CO1       | Know and recognize the various formal forms, techniques and styles in British Poetry.  | <b>K1 Remember</b>                     |
| CO2       | Understand, appreciate the knowledge of literary traditions in British poetry and the many dimensions of it.   | <b>K2 Understand</b>                   |
| CO3       | Examine the techniques of other writers and draft their own style in poetry and demonstrate their skill of creativity.   | <b>K3 Apply</b>                        |
| CO4       | Compare and create modern styles by analysing the various styles, themes and forms of British poetry thereby developing critical thinking, skills of imagination and creativity. | <b>K4 Analyze &amp; Synthesis</b>      |
| CO5       | Integrate and formulate new styles in poetry and express their ideas creatively and innovatively in a unique form.   | <b>K5&amp;K6 Evaluate &amp; Create</b> |

#### Mapping with Programme Outcomes

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | M          | M          |
| <b>CO2</b> | S          | S          | M          | S          | M          |
| <b>CO3</b> | M          | M          | S          | S          | S          |
| <b>CO4</b> | M          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | M          | S          |

**S- Strong; M – Medium**

## **SYLLABUS**

### **UNIT- I**

**12 Hrs**

#### **Introduction to the Forms of poetry**

The Sonnet, The Elegy, The Ode, The Epic, The Ballad, The Lyric, The Dramatic Monologue, Allegory

#### **Stanza forms**

Blank Verse, Couplet, Tercet, Terza Rima, Quatrain , Rhyme Royal, Ottava Rima, Spenserian Stanza

Sir Thomas Wyatt -Whoso list to hunt

Spenser- from Amoretti LXXV: One Day I Wrote her Name

Shakespeare-Sonnet 18: Shall I compare thee to a summer's day?

Donne- A Valediction Forbidding Mourning

Marvell- To His Coy Mistress

### **UNIT-II**

**12 Hrs**

Milton- Paradise Lost (Book I Lines 1-125)

John Dryden-A Song for St.Cecilia's Day

Alexander Pope-An Essay on Man: Epistle II (Stanza 1 Know then thyself -Which serv'd the past, and must the times to come)

Thomas Gray- An Elegy Written in a Country Churchyard

William Blake- The Tyger

### **UNIT-III**

**12 Hrs**

William Wordsworth- Daffodils

S. T. Coleridge- Kubla Khan

P. B. Shelley-Ozymandias

John Keats- Ode on a Grecian Urn

### **UNIT-IV**

**12 Hrs**

A.L. Tennyson- The Lotos Eaters

Robert Browning- My Last Duchess

Christina Rossetti- An Apple-Gathering

Matthew Arnold- Dover Beach

W. B. Yeats- The Second Coming

**UNIT-V****12 Hrs**

T. S. Eliot- The Preludes  
 Wilfred Owen- Anthem for Doomed youth  
 Ted Hughes-Crow Blacker than Ever  
 Philip Larkin-Church Going

**Total Hours-60****TEACHING METHODOLOGY**

- Classroom Lectures
- PowerPoint
- Listening to author recitation
- Seminars
- Assignments, Tests

**TEXT BOOKS:**

| S.NO | Authors                  | Title          | Publishers                                   | Year of Publication |
|------|--------------------------|----------------|--|---------------------|
| 1    | N.K.Misra and N.Mukherji | Wing of Poesy  | S.Chand and company Ltd                      | 1999                |
| 2.   | Robert Browning          | Selected poems | LakshmaiNarainAgarwal Educational Publishers | 1998                |

**REFERENCE BOOKS:**

| S.NO | Authors                | Title                                   | Publishers  | Year of Publication |
|------|------------------------|---|---|---------------------|
| 1    | AmbikasenGupta         | Selected college poems                  | Orient Longman  | 1987                |
| 2.   | Alfred H.Upham, Ph.D., | The Typical forms of English Literature | A.I.T.B.S. Publishers and distributors, Krishan Nagar, NewDelhi – 51. | 2007                |
| 3.   | S.P.S.Dahiya           | Vision in verse An Anthology of Poems   | Oxford University Press, Chennai                                      | 1997                |
| 4.   | Dr.Sen                 | John Donne- Selected Poems              | Unique publishers, New Delhi.   | 2005                |
| 5.   | Dr.Sen                 | Paradise Lost book I by John Milton     | Unique Publishers, New Delhi.   | 2005                |

|    |            |                                |  |      |
|----|------------|--------------------------------|--|------|
| 6. | RamjiLall. | Studies in Poets-<br>W.B.Yeats | Rama Brothers<br>India Pvt. Ltd.<br>Educational<br>Publishers, New<br>Delhi. | 1987 |
|----|------------|--------------------------------|--|------|

### WEB SOURCES:

EBook – Wilfred Owen – Anthem for Doom Youth Pub: Penguin classics.

[www.Penguin.com](http://www.Penguin.com), [www.Shmoop.com/anthem for doomed - youth/](http://www.Shmoop.com/anthem-for-doomed-youth/)

[www.bachelor and master.com/britishandamericanpoetry/ preludes-summary.html](http://www.bachelorandmaster.com/britishandamericanpoetry/preludes-summary.html).

[www.Shakespeare-online .com/sonnets/18detail.html](http://www.Shakespeare-online.com/sonnets/18detail.html).

[www.poemhunter.com/poem/with serving-still/](http://www.poemhunter.com/poem/with-serving-still/)

[www.englishsummary.com/lesson/paradiselost-book-summary](http://www.englishsummary.com/lesson/paradiselost-book-summary)

[www.enotes.com/topics/his-coy-mistress\](http://www.enotes.com/topics/his-coy-mistress)

[www.poets.org/poetsorg/poem/tyger](http://www.poets.org/poetsorg/poem/tyger)

[www.cummingsstudyguides.net/Guides2/Tiger.html](http://www.cummingsstudyguides.net/Guides2/Tiger.html)

[www.toppr.com/bytes/ summary-of-ozymandias/](http://www.toppr.com/bytes/summary-of-ozymandias/),

[www.shmoop.com/ozymandias/summary.html](http://www.shmoop.com/ozymandias/summary.html)10.[www.bachelorandmaster.com/britishandamericanpoetry/the-lotos-eaters-summary.html](http://www.bachelorandmaster.com/britishandamericanpoetry/the-lotos-eaters-summary.html)

[www.shmoop.com/church-going/summary.html](http://www.shmoop.com/church-going/summary.html)

[www.tweetspeakpoetry.com/2013/12/03/poets-poems-ted-hughes-crow](http://www.tweetspeakpoetry.com/2013/12/03/poets-poems-ted-hughes-crow)

### VIDEOS:

<https://www.youtube.com/watch?v=AUqowAVgZxA>(Tiger)

<https://www.youtube.com/watch?v=2fDm9cRWTrg> (paradise Lost)

[www.youtube.com/watch=GVtek8WcuMc](http://www.youtube.com/watch=GVtek8WcuMc)(Lotus Eater)

### COURSE DESIGNERS

1. Ms. V.P. Gayathri

Head & Asst.Prof in English

2. Mrs R. Sarathy

Asst. Prof in English

3. Mrs. M. Angelin Mercy

Asst. Prof in English

### LITERARY FORMS AND TERMS

| Sem | Sub Code | Category       | Lecture    |              | Theory     |              | Practical | Credit |
|-----|----------|----------------|------------|--------------|------------|--------------|-----------|--------|
|     |          |                | Hrs<br>P/W | Hrs<br>P/Sem | Hrs<br>P/W | Hrs<br>P/Sem |           |        |
| I   |          | Allied Paper-I | 7          | 105          | 7          | 105          | -         | 5      |

#### COURSE OBJECTIVES:

- To provide the students with the basic knowledge of the genres in literature.
- To make them aware of the various literary terms and forms.

#### COURSE OUTCOMES:

On the successful completion of the course students will be able to,

| CO Number | CO Statement   | Knowledge Level (K1-K5)                |
|-----------|--|--|
| CO1       | Acquire familiarity with a wide range of literary terms, categories relating to literary history, theory.    | <b>K1 Remember</b>                     |
| CO2       | Demonstrate an ability to grasp and synthesize ideas in literary forms and terms in historical context.      | <b>K2 Understand</b>                   |
| CO3       | Remember in detail the important terms and forms in literature.  | <b>K3 Apply</b>                        |
| CO4       | Evaluate genres of writing and write in appropriate genres and modes for a variety of purposes and audience. | <b>K5&amp;K6 Evaluate &amp; Create</b> |

#### Mapping with Programme Outcomes

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | M   | S   |
| CO2 | S   | S   | S   | S   | M   |
| CO3 | M   | M   | S   | S   | M   |
| CO4 | M   | M   | S   | S   | M   |

*S- Strong; M – Medium*

#### SYLLABUS

Unit-I Poetry

21Hrs

Ode, Sonnet, Elegy, Epic, Mock-Epic, Ballad, Dramatic Monologue, Lyric, Epigram, Rubaiyat, Haiku, Limerick, Satire.

## **Unit-II Prose**

**21Hrs**

Essay, Biography, Auto-Biography, Travelogues, Allegory, Satire, Short Story.

## **Unit-III Drama**

**21Hrs**

Tragedy, Senecan Tragedy, Mystery And Miracle Plays, Interludes, Heroic Tragedy, Historic Drama, Comedy(Comedy Of Manners, Comedy Of Humours, Sentimental Drama, Anti-Sentimental Comedy, Romantic Comedy), Tragi-Comedy, Black Comedy, Poetic Drama, Absurd Theatre, Epic Theatre, Theatre Of Cruelty, Kitchen-Sink Drama, Farce.

## **Unit-IV Fiction**

**21Hrs**

Epistolary Novel, Picaresque, Bildungsroman, Kunstlerroman, Roman A Clef, Historical Novel, Social Novel, Psychological Novel, Stream Of Consciousness, Interior Monologue, Detective Fiction, Science Fiction, Magic Realism Climatic Fiction, Fairy Tale, Fan Fiction.

## **Unit-V Literary Terms**

**21Hrs**

Epic Simile, Metaphor, Allusion, Oxymoron, Metonymy, Synecdoche, Alliteration Onomatopoeia, Assonance, Consonance, Epigraph, Foot, Rhyme, Meter, Imagery, Refrain, Symbolism, Three Unities Of Drama, Soliloquy, Aside, Bathos, Irony(Dramatic, Verbal, Situational) Anagnorisis, Peripeteia, Catharsis, Comic Relief, Chorus, Deus Ex Machina, Freytag's Triangle, Hubris, Tragic Flaw, Fable, Plot, Flat& Round Character, Suspension Of Disbelief.

**Total Hours-105**

## **TEACHING METHODOLOGY**

- Classroom Lectures
- PowerPoint
- Screening Movies
- Seminars
- Assignments, Tests

## **BOOKS FOR REFERENCE:**

| <b>S.No</b> | <b>Name of the Book</b> | <b>Name of the Author</b> | <b>Publication</b> | <b>Year</b> |
|-------------|-------------------------|---------------------------|--------------------|-------------|
| 1.          | Literary Terms          | M.H.Abrams                | Harcourt India     | 2001        |

|    |   |            |   |      |
|----|---|------------|---|------|
| 2. | The typical forms of English Literature | A.H.Upham  | Oxford University Press                   | 1917 |
| 3. | Introduction to the study of Literature | W.H.Hudson | All India Traveller Book Seller New Delhi | 2003 |
| 4. | An Introduction To English Literature   | R.J.Rees   | Macmillan                                 | 1966 |

#### **WEB SOURCES:**

<https://literary.terms.net>.

<https://literary.devices.com>.

[https://en.m.wikipedia.org>wiki>glossary.apps](https://en.m.wikipedia.org/wiki/glossary.apps): literary Terms , About Brahman Moron.

#### **COURSE DESIGNERS**

1. Ms. V.P. Gayathri  
Head & Asst.Prof in English
2. Mrs R.Sarathy  
Asst. Prof in English
3. Mrs. S. Indragandhi  
Asst. Prof in English

### **AMERICAN LITERATURE**

| Sem | Sub Code | Category       | Lecture |           | Theory  |           | Practical | Credit |
|-----|----------|----------------|---------|-----------|---------|-----------|-----------|--------|
|     |          |                | Hrs P/W | Hrs P/Sem | Hrs P/W | Hrs P/Sem |           |        |
| II  |          | Core Paper-III | 4       | 60        | 4       | 60        | -         | 3      |

#### **COURSE OBJECTIVE:**

- To acquaint the learners with the American life and culture as reflected in the American creative endeavour.

#### **COURSE OUTCOMES:**

On the successful completion of the course students will be able to,



| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K1-K5)</b>   |
|------------------|---|----------------------------------|
| CO1              | Demonstrate familiarity with the tone and expression of the American literary artists.  | <b>K1 Remember</b>               |
| CO2              | Comprehend and summarize the social and political forces shaping American culture and literature during different time periods. | <b>K2 Understand</b>             |
| CO3              | Organize and develop critical reasoning and reactions to the prescribed texts, peer critics and literary discussions.           | <b>K3 Apply</b>                  |
| CO4              | Analyse the text of American authors with the dynamic theories conceived by the modern writers of America.                      | <b>K4 Analyze&amp; Synthesis</b> |

#### **Mapping with Programme Outcomes**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | M          | M          |
| <b>CO2</b> | S          | S          | M          | S          | M          |
| <b>CO3</b> | M          | S          | S          | S          | S          |
| <b>CO4</b> | M          | M          | S          | S          | S          |

**S - Strong; M - Medium**

#### **SYLLABUS**

##### **Unit-I Poetry (Detailed)**

**12 Hrs**

Edgar Allan Poe- The Raven

Emily Dickinson - Because I Could Not Stop for Death, Success Is Counted Sweetest

Walt Whitman- One's Self I Sing

Emerson- Hamatreya

Robert Frost - Mending Wall, The Road Not Taken

Sylvia Plath - Lady Lazarus

##### **Unit-II Prose(Detailed)**

**12Hrs**

Edgar Allan Poe- The Philosophy of Composition

**(Non-Detailed)**

Thoreau- Where I lived, and What I lived for (Walden)

Emerson- Nature

##### **Unit-III Drama**

**12 Hrs**

**(Detailed)**

Tennessee Williams- The Glass Menagerie

**(Non-Detailed)**

Arthur Miller- The Death of a Salesman

Eugene O'Neill- Emperor Jones

**Unit-IV Short Story****12 Hrs**

E. A. Poe- The Purloined Letter  
 Nathaniel Hawthorne- Young Goodman Brown  
 O' Henry- The Cactus  
 Kate Chopin- The Story of an Hour  
 Charlotte Perkins Gilman- The Yellow Wallpaper

**Unit-V Fiction****12 Hrs**

Nathaniel Hawthorne- The Scarlet Letter  
 Mark Twain- The Adventures of Tom Sawyer  
 Ernest Hemingway- The Old man and The Sea  
 Harper Lee- To Kill a Mocking Bird

**Total Hours: 60****TEACHING METHODOLOGY**

- Classroom Lectures
- PowerPoint
- Screening Movies
- Seminars
- Assignments, Tests

**REFERENCES:**

| <b>S.NO</b> | <b>Authors</b>             | <b>Title</b>   | <b>Publishers</b>                     | <b>Year of Publication</b> |
|-------------|----------------------------|--|---------------------------------------|----------------------------|
| 1           | Donald, Heiney & Lenteil H | Essentials of Contemporary Literature of the Western World, (vol, 3&4) | Baron's Educational Series            | 1918                       |
| 2.          | Hoffman, Daniel            | Contemporary Guide to American Writing                                 | Indian Reprint, OUP. Delhi            | 1981                       |
| 3.          | MacGowan, Christopher      | Twentieth Century American Poetry                                      | Blackwell Publication                 | 2005                       |
| 4.          | Massa, Ann                 | American Literature in Context   | Methuen & Co. Ltd. London & New York. | 1982                       |
| 5.          | Vinson, James              | Twentieth Century American Literature                                  | Macmillan                             | 1980                       |

**WEBSOURCES:**

<https://getit.library.nyu.edu/go/3588410>

<https://getit.library.nyu.edu/go/3588458>

<https://getit.library.nyu.edu/go/3588535>

<https://getit.library.nyu.edu/go/3588642>

<https://getit.library.nyu.edu/go/3580904>

<http://dbs.lib.byu.edu/oxford-companion-to-american-literature>

<http://dbs.lib.byu.edu/oxford-encyclopedia-of-american-literature>

<https://databases.library.jhu.edu/databases/proxy/JHU06924>

### **COURSE DESIGNERS**

1. Ms. V.P. Gayathri

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2. Mrs R.Sarathy

Asst. Prof in English

3. Ms. M. Gayathri

Asst. Prof in English

### **INDIAN WRITING IN ENGLISH**

| Sem | Sub<br>Code | Category         | Lecture |       | Theory |       | Practical | Credit |
|-----|-------------|------------------|---------|-------|--------|-------|-----------|--------|
|     |             |                  | Hrs     | Hrs   | Hrs    | Hrs   |           |        |
|     |             |                  | P/W     | P/Sem | P/W    | P/Sem |           |        |
| II  |             | Core<br>Paper-IV | 4       | 60    | 4      | 60    | -         | 3      |

### **COURSE OBJECTIVE:**

- To provide a thorough knowledge of the historical, literary and theoretical aspects of Indian Writing in English literature.

### **COURSE OUTCOMES:**

On the successful completion of the course students will be able to,

| CO<br>Number | CO Statement  | Knowledge<br>Level<br>(K1-K5) |
|--------------|---|-------------------------------|
| CO1          | Have knowledge of the various phases of evolution in Indian Writing in English. | <b>K1<br/>Remember</b>        |

|     |   |                                  |
|-----|---|----------------------------------|
| CO2 | Comprehend and summarize the history and the growth of Indian Writing in English.                                       | <b>K2 Understand</b>             |
| CO3 | Appreciate the Indian ethos and aesthetic value of Indian culture and compare it with western culture.                  | <b>K3 Apply</b>                  |
| CO4 | Sensitize the uniqueness of Indian writing in English among the various types of literature and analyse its nativeness. | <b>K4 Analyze&amp; Synthesis</b> |

#### Mapping with Programme Outcomes

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | S   | S   |
| CO2 | M   | S   | S   | S   | S   |
| CO3 | M   | M   | M   | S   | M   |
| CO4 | S   | M   | S   | S   | S   |

**S- Strong;**

**M – Medium**

## SYLLABUS

### Unit-I-Poetry (Detailed)

**12Hrs**

Rabindranath Tagore: Gitanjali (Lyrics 1-10)

Sarojini Naidu- The Queen's Rival

Toru Dutt- The Casuarina Tree

Kamala Das- An Introduction

Nissim Ezekiel-Poet, Lover, Bird Watcher

Jayanta Mahapatra- Hunger

Arun Kolatkar-Scratch from Jejuri

### Unit-II- Prose

**12 Hrs**

#### (Detailed)

Ananda Coomaraswamy- The Dance of Shiva

#### (Non-Detailed)

M.K. Gandhi-The Story Of My Experiment With Truth (Chapter 8)

J. Nehru-The Old Indian Theatre from The Discovery Of India

S. Radhakrishnan -The World Community  
 A K Ramanujan- On Folklore and Folk Puranas  
 Amitav Ghosh- The Anglophone Empire

### **Unit-III - Drama**

**12 Hrs**

#### **(Detailed)**

GirishKarnad - Nagamandala

#### **(Non-Detailed)**

Tagore-Chitra

Mahesh Dattani- Seven Steps Around the Fire

### **Unit-IV Short Story**

**12 Hrs**

Premchand- Catastrophe

Chitra B. Divakaruni- The Bats (From Arranged Marriage)

Jhumpa Lahiri- Mrs.Sen's (From The Interpreter of Maladies)

### **Unit-V Fiction**

**12 Hrs**

R.K. Narayan-Swami & Friends

Mulkraj Anand-Coolie

Amitav Ghosh- The Hungry Tide

Shashi Deshpande- The Dark Holds No Terror

**Total Hours:60**

### **TEACHING METHODOLOGY**

- Classroom Lectures
- PowerPoint
- Screening Movies
- Seminars
- Assignments, Tests

### **TEXT BOOKS:**

| <b>S.NO</b> | <b>Authors</b>   | <b>Title</b>                     | <b>Publishers</b>           | <b>Year of Publication</b> |
|-------------|------------------|----------------------------------|-----------------------------|----------------------------|
| 1           | W.B.Yeats        | Gitanjali by Rabindranath Tagore | Sterling publishers pvt,Ltd | 2007                       |
| 2.          | Jawaharlal Nehru | Discovery of India               | Penguin Publisher           | 1946                       |

|  |  |  |             |  |
|--|--|--|-------------|--|
|  |  |  | private Ltd |  |
|--|--|--|-------------|--|

### BOOKS FOR REFERENCE:

| S.NO | Authors                  | Title   | Publishers   | Year of Publication         |
|------|--------------------------|---|--|-----------------------------|
| 1    | Ananda K. Coomaraswamy   | Dance of Shiva Essays on Indian Art and Culture | Dover Publication,inc. New York  | 1918                        |
| 2.   | Mahesh Dattani           | Seven Steps Around the Fire                     | Penguin Publishers Private Ltd, New Delhi  | 15 July 2013                |
| 3.   | Bruce King               | Introduction in Modern Indian Poetry in English | Oxford India Paperback   | 14 <sup>th</sup> April 2005 |
| 4.   | Amitav Ghosh             | The Hungry Tide                                 | Ravi Dayal Publishers: A Mariner book Houghton Mifflin Company Boston, New York. | 1988                        |
| 5.   | R.K.Narayan              | Malgudi Days                                    | Hamilton Printers.   | 1935                        |
| 6.   | Jhumpa Lahiri            | Interpreter of Maladies                         | Mariner books Houghton Mifflin Harcourt, Boston, New York.                       | 2003                        |
| 7.   | <u>Jayanta Mahapatra</u> | Collected Poems                                 | Paperwall Media & Publishing Pvt.Ltd.New Delhi                                   | 2017                        |

### WEB SOURCES:

<http://www.sacred-texts.com/hin/tagore/gitanjali.htm>

[www.allpoetry.com/Our-Casuarina-Tree](http://www.allpoetry.com/Our-Casuarina-Tree)

[www.penguin.co.in/book/non-fiction/discovery-of-india/](http://www.penguin.co.in/book/non-fiction/discovery-of-india/)

[www.abebbooks.com/world-community-S-Radhakrishnan-Embassy-India/7222913530/bd](http://www.abebbooks.com/world-community-S-Radhakrishnan-Embassy-India/7222913530/bd)

<http://episteme.net.in/web.content/d.73/content/681/attachments/6-queer.pdf>

<http://www.supersummary.com/the-shadow-lines/summary/>

[englishsummary.com/swami-and-friends-summary/](http://englishsummary.com/swami-and-friends-summary/)

[www.coursehero.com/lit/Interpreter-of-Maladies/plot-summary/](http://www.coursehero.com/lit/Interpreter-of-Maladies/plot-summary/)

[www.enotes.com/topics/interpreter-maladies](http://www.enotes.com/topics/interpreter-maladies)

[/www.lyrikline.org/en/poems/hunger-4849\(hunger\),](http://www.lyrikline.org/en/poems/hunger-4849(hunger),) <https://englishsummary.com/hunger-poem-jayanta-mahapatra/>

<https://rathuenglishnotes.blogspot.com/p/sarojini-naidu-queens-rival-there-is.html>

<https://www.newyorker.com/magazine/2003/04/07/the-anglophone-empire>

## VIDEOS

1. [www.youtube.com/watch?v=d2eO-JZCovM](http://www.youtube.com/watch?v=d2eO-JZCovM) (Our Casuarina Tree)

2. [www.youtube.com/watch?v=kMlyEMir\\_1g](http://www.youtube.com/watch?v=kMlyEMir_1g) (The World Community)

3. [www.youtube.com/watch?v=R1IvCeLT0FQ](http://www.youtube.com/watch?v=R1IvCeLT0FQ) (Seven Steps Around the Fire)

[www.youtube.com/watch?v=BJsbK7na2oM](http://www.youtube.com/watch?v=BJsbK7na2oM) (Dance of shiva)

4. <https://www.youtube.com/watch?v=4iaCmS0NhTw> (Nagamandala)

## COURSE DESIGNERS

1. Ms. V.P. Gayathri

Head & Asst.Prof in English

2. Mrs R.Sarathy

Asst. Prof in English

3. Mrs. S.Asha

Asst. Prof in English

## SOCIO-CULTURAL HISTORY OF ENGLAND

| Sem | Sub Code | Category        | Lecture |           | Theory  |           | Practical | Credit |
|-----|----------|-----------------|---------|-----------|---------|-----------|-----------|--------|
|     |          |                 | Hrs P/W | Hrs P/Sem | Hrs P/W | Hrs P/Sem |           |        |
| II  |          | Allied Paper-II | 7       | 105       | 7       | 105       | -         | 5      |

## COURSE OBJECTIVE:

- To provide the students with a basic knowledge of the cultural, political and social history of England with reference to important incidents and movements in English history.

## COURSE OUTCOMES:

On the successful completion of the course students will be able to,

| CO Number | CO Statement | Knowledge Level (K1-K5) |
|-----------|--------------|-------------------------|
|-----------|--------------|-------------------------|

|     |  |  |
|-----|--|--|
| CO1 | Know and explore the nature of history and key changes of England's developments from the past.  | <b>K1<br/>Remember</b>                         |
| CO2 | Understand the ideas, movements, people and events of the past that shaped the present civilization of England.                                    | <b>K2<br/>Understand</b>                       |
| CO3 | Critically analyze the social life of an era mirrored in the Literature of the corresponding era.  | <b>K3<br/>Apply</b>                            |
| CO4 | Synthesise the ideas of thought, culture, and traditions of England reflected in the study of Literature.  | <b>K4<br/>Analyze&amp;<br/>Synthesis</b>       |
| CO5 | Create connections between the historical events and cultural impacts corresponding to the development of new theories in Language and Literature. | <b>K5&amp;K6<br/>Evaluate &amp;<br/>Create</b> |

#### **Mapping with Programme Outcomes**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | M          | S          | S          |
| <b>CO3</b> | M          | M          | S          | S          | M          |
| <b>CO4</b> | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | M          | S          |

**S- Strong; M – Medium**

#### **SYLLABUS**

#### **Unit-I Early Period**

**21Hrs**

British Isles, Formation of England, Roman Conquest, Anglo-Saxon, Norman Conquest, Manorial System, Magna Carta, The Crusades, The Hundred Years Wars, Black Death, Peasant's Revolt.

#### **Unit-II Tudor & Stuart**

**21Hrs**

War of Roses, Establishment of Tudor Monarchy, Renaissance, Reformation, Age of Queen Elizabeth, Spanish Armada, Colonial Expansion and Trading Companies, The Age of Stuarts, Growth of Royal Absolutism, Civil War, Puritan Age, Oliver Cromwell and The Commonwealth

#### **Unit-III Restoration and After**

**21 Hrs**

Restoration, Society & Morals, Queen Anne's England, Coffee Houses, Agrarian Revolution, Impact of the French Revolution

#### **Unit-IV Victorian Era**

**21Hrs**

Industrial Revolution, Science & Technology, Features of the Victorian Era, Development of Communication, Reform Bills



**Unit-V Twentieth Century and After****21 Hrs**

Beginnings-First World War & After, Second World War & After, Cold War, Sixties & Seventies, Eighties, Contemporary Life in Britain

**TotalHours:105****TEACHING METHODOLOGY**

- Classroom Lectures
- PowerPoint
- Seminars
- Assignments, Tests

**TEXT BOOKS:**

| S.No | Authors     | Title  | Publishers                                     | Year of Publication |
|------|-------------|--|--|---------------------|
| 1    | Asa. Briggs | A Social History Of England                      | Penguin  | 1999                |
| 2.   | A.G. Xavier | An Introduction to the Social History of England | Viswanathan, S., Printers & Publishers Pvt Ltd | 2009                |

**REFERENCE BOOKS:**

| S.NO | Authors                | Title   | Publishers                   | Year of Publication |
|------|------------------------|---|------------------------------|---------------------|
| 1    | G.M. Trevelyan:        | The English Social History  | Doubleday                    | 2009                |
| 2    | BibhashChoudhary       | English Social and Cultural History: An Introductory Guide and Glossary | PHI Learning Private Limited | 2010                |
| 3    | <u>Keith Wrightson</u> | A Social History of England, 1500–1750                                  | Cambridge University Press   | 2017                |

**WEB SOURCES:**

<https://history.yale.edu/publications/social-history-england-1500-1750>  
<https://www.tandfonline.com/doi/full/10.1080/03071022.2017.1397371>  
<https://www.historyofengland.net/british-empire/british-empire-summary>  
<https://study.com/academy/.../19th-century-england-society-social-classes-culture.html>

**COURSE DESIGNERS**

- Ms. V.P. Gayathri  
Head & Asst Prof in English

2. Mrs.R.Sarathy  
Asst. Prof in English
3. Mrs.S.Asha  
Asst. Prof in English

## **DEPARTMENT OF ENGLISH - PG**

### **PROGRAMME OBJECTIVES**

The programme aims to develop the ability of students to critically examine and relate their understanding of literary texts employing individual linguistic skills, engendering application of literary concepts and critical approaches to arrive at the core and essence of narratives.

The learning process would also lead to a larger comprehension of global and national social issues thereby facilitating the students to address them proactively.

### **PROGRAMME OUTCOMES**

On completion of the Programme the student will be able to:

1. Interpret and demonstrate her understanding of form, structure, narrative techniques, literary devices and style.
2. To analyze and apply various literary concepts and critical approaches.
3. To organize and integrate the acquired knowledge towards individualistic compositions.
4. To present, appraise and defend arguments with conviction and confidence.

### **SEMESTER – I**

| S.NO | PART | STUDY COMPONENTS | INS.HRS/<br>WEEK | CREDITS | TITLE OF<br>THE PAPER            | CIA | UNIV<br>EXAM | TOTAL |
|------|------|------------------|------------------|---------|----------------------------------|-----|--------------|-------|
|      |      | COURSE TITLE     |                  |         |                                  |     |              |       |
| 1    | I    | Core – I         | 6                | 5       | Chaucer and the Elizabethan Age  | 25  | 75           | 100   |
| 2    | II   | Core – II        | 6                | 5       | Restoration and The Augustan Age | 25  | 75           | 100   |
| 3    | III  | Core – III       | 6                | 5       | The Romantic Age                 | 25  | 75           | 100   |
| 4    | IV   | Core – IV        | 6                | 5       | The Victorian Age                | 25  | 75           | 100   |
| 5    | V    | Elective – I     | 6                | 3       | a.Post-Modern Fiction (or)       | 25  | 75           | 100   |
|      |      |                  |                  |         | b.Genre Fiction                  |     |              |       |
|      |      | Grand Total      | 30               | 23      |                                  |     |              | 500   |

\* Optional Self Study Course in the odd semester with extra credit of two.

\* Optional Online Course in the odd semester with extra credit of two.

## SEMESTER – II

| S.No | PART | STUDY COMPONENTS | INS.HRS/<br>WEEK | CREDITS | TITLE OF<br>THE PAPER               | CIA | UNIV<br>EXAM | TOTAL |
|------|------|------------------|------------------|---------|-------------------------------------|-----|--------------|-------|
|      |      | COURSE TITLE     |                  |         |                                     |     |              |       |
| 1    | I    | Core – V         | 6                | 5       | 20 <sup>th</sup> Century Literature | 25  | 75           | 100   |
| 2    | II   | Core – VI        | 6                | 5       | American Literature                 | 25  | 75           | 100   |
| 3    | III  | Core – VII       | 6                | 5       | Introduction To World Literature    | 25  | 75           | 100   |
| 4    | IV   | Core – VIII      | 6                | 4       | Indian Literature In English        | 25  | 75           | 100   |
| 5    | V    | Elective – II    | 4                | 3       | a.Travel Literature (or)            | 25  | 75           | 100   |
|      |      |                  |                  |         | b.Detective and Spy Fiction         |     |              |       |
| 6    |      | Human Rights B   | 2                | 2       |                                     | 25  | 75           | 100   |
|      |      | Grand Total      | 30               | 24      |                                     |     |              | 500   |

## SEMESTER – III

| S.No | PART | STUDY COMPONENTS | INS.HRS/<br>WEEK | CREDITS | TITLE OF<br>THE PAPER               | CIA | UNIV<br>EXAM | TOTAL |
|------|------|------------------|------------------|---------|-------------------------------------|-----|--------------|-------|
|      |      | COURSE TITLE     |                  |         |                                     |     |              |       |
| 1    | I    | Core – IX        | 6                | 5       | Shakespeare                         | 25  | 75           | 100   |
| 2    | II   | Core – X         | 6                | 5       | ELT                                 | 25  | 75           | 100   |
| 3    | III  | Core – XI        | 6                | 4       | History of Language and Linguistics | 25  | 75           | 100   |
| 4    | IV   | Core – XII       | 6                | 4       | Indian Aesthetics                   | 25  | 75           | 100   |
| 5    | V    | Elective – III   | 6                | 3       | a.Grammar and Usage (or)            | 25  | 75           | 100   |
|      |      |                  |                  |         | b.Creative writing                  |     |              |       |
|      |      | Grand Total      | 30               | 21      |                                     |     |              | 500   |

\* Optional internship training programme during summer vacation of the second semester for an extra credit of one.

\* Optional Self Study Course in the odd semesters with Two extra credits

\* Optional Online Course in the odd semesters with Two extra credits

#### SEMESTER – IV

| S.No | PART | STUDY COMPONENTS | INS.HRS/<br>WEEK | CREDITS | TITLE OF THE PAPER                   | CIA | UNIV EXAM | TOTAL |
|------|------|------------------|------------------|---------|--------------------------------------|-----|-----------|-------|
|      |      | COURSE TITLE     |                  |         |                                      |     |           |       |
| 1    | I    | Core – XIII      | 6                | 5       | New Literatures In English           | 25  | 75        | 100   |
| 2    | II   | Core – XIV       | 6                | 5       | Contemporary Criticism               | 25  | 75        | 100   |
| 3    | III  | Core – XV        | 6                | 4       | Modern European Literature           | 25  | 75        | 100   |
| 4    | IV   | Elective – IV    | 6                | 3       | a.Literature, Culture and Media (or) | 25  | 75        | 100   |
|      |      |                  |                  |         | b.UGC-NET/SET PAPER                  |     |           |       |
| 5    | V    | Project          | 6                | 5       |                                      | 25  | 75        | 100   |
|      |      |                  |                  |         |                                      |     |           |       |
|      |      | Grand Total      | 30               | 22      |                                      |     |           | 500   |

#### CONSOLIDATED STATEMENT

| SUBJECT      | PAPERS | HOURS | CREDITS           | TOTAL CREDITS | MARKS | TOTAL MARKS |
|--------------|--------|-------|-------------------|---------------|-------|-------------|
| Core         | 15     | 90    | 11x5=55<br>4x4=16 | 71            | 100   | 1500        |
| Elective     | 4      | 22    | 3x4=12            | 12            | 100   | 400         |
| Human Rights | 1      | 2     | 2                 | 2             | 100   | 100         |
| Project      | 1      | 6     | 5                 | 5             | 100   | 100         |
| Total        |        | 120   |                   | 90            |       | 2100        |

#### CHAUCER AND THE ELIZABETHAN AGE

| Sem | Subject Code | Category     | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|--------------|---------|--------------|---------|--------------|-----------|--------|
| I   |              | Core paper I | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 5      |
|     |              |              | 90      | 6            | 90      | 6            |           |        |

#### **COURSE OBJECTIVE:**

- To provide in depth knowledge of the beginning of English Literature till the Elizabethan age.

#### **COURSE OUTCOMES:**

On the successful completion of the course, students will be able to...

| CO Number | CO Statement   | Knowledge Level (K1-K5)   |
|-----------|--|---------------------------|
| CO1       | Display a working knowledge of historical and cultural context of British Literature from the beginnings to the Elizabethan Age. | K1<br>Understand          |
| CO2       | Effectively understand and communicate ideas related to the literary works during class and group activities.                    | K2<br>Comprehend          |
| CO3       | Identify and describe distinct literary characteristics of British Literature from the beginning to the Elizabethan Age          | K3<br>Remember            |
| CO4       | Analyze the structure and meaning of the literary works  | K4<br>Analyze & Synthesis |
| CO5       | Understand the socio-political climate of Great Britain  | K5<br>Evaluate & Create   |

#### **Mapping with Programme Outcomes:**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | M   | S   |
| CO2 | S   | S   | S   | M   | M   |
| CO3 | M   | S   | S   | S   | M   |
| CO4 | S   | M   | S   | S   | M   |
| CO5 | S   | S   | M   | M   | S   |

**S- Strong; M – Medium**

### **SYLLABUS**

#### **Unit-I**

**18 Hrs**

Geoffrey Chaucer- Prologue to the Canterbury Tales  
Edmund Spenser- Epithalamion

#### **Unit-II**

**18 Hrs**

Earl of Surrey-Alas, So now all things now do hold their peace  
John Donne – The Canonization, The Sun Rising, A Valediction: Of My Name in the Window, Farewell to Love

**Unit - III****18 Hrs**

Francis Bacon- Of Books, Of Love, Of Adversity, Of Studies and Of Truth  
 Sir Philip Sidney- An Apology for Poetry

**Unit-IV****18 Hrs**

Christopher Marlowe- Edward II (Detailed Study)  
 Ben Jonson- Every Man in His Humour

**Unit-V****18 Hrs**

John Webster- The Duchess of Malfi  
 Thomas Kyd – The Spanish Tragedy

**Total Hours: 90****Distribution of Marks:** Theory 75% and Internal marks 25%**TEACHING METHODOLOGY:**

- Classroom Lectures
- Power Point Presentations.
- Screening Movies
- Seminars
- Assignments and tests

**TEXT BOOKS:**

| S.No | Authors            | Title                            | Publishers               | Year Of Publication |
|------|--------------------|----------------------------------|--------------------------|---------------------|
| 1    | C.N. Ramachandiran | Five Centuries of Poetry         | Trinity                  | 2014                |
| 2    | Geoffrey Chaucer   | Prologue to the Canterbury Tales | OUP                      | 1994                |
| 3    | Matheson           | Bacon's Essays                   | OUP                      | 1927                |
| 4    | Sir Philip Sidney  | An Apologie for Poetry           | Manchester UP            | 2002                |
| 5    | Marlow             | Edward II                        | Macmillan                | 2001                |
| 6    | Ben Jonson         | Every Man in His Humour          | Createspace independent  | 2018                |
| 7    | John Webster       | The Duchess of Malfi             | Unique                   | 2014                |
| 8    | Thomas Kyd         | The Spanish Tragedy              | Create space independent | 2014                |

**REFERENCE BOOKS:**

| S.No | Authors       | Title  | Publishers             | Year Of Publication |
|------|---------------|--|------------------------|---------------------|
| 1    | Bruce King    | Seventeenth Century English Literature         | Macmillan              | 1982                |
| 2    | John Jones    | On Aristotle and Greek Tragedy                 | Chatto& Windus         | 1967                |
| 3    | David Daiches | A Critical History of English Literature Vol.1 | Supernova Publications | 2011                |

**COURSE DESIGNERS:**

1. Ms.V.P.Gayathri  
Assistant Professor & Head,
2. Mrs. M. Gayathri,  
Assistant Professor
3. Dr. M. Manimozhi Vinesh  
Assistant Professor

**RESTORATION AND THE AUGUSTAN AGE**

| Sem | Subject Code | Category      | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|---------------|---------|--------------|---------|--------------|-----------|--------|
| I   |              | Core paper II | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 5      |
|     |              |               | 90      | 6            | 90      | 6            |           |        |

**COURSE OBJECTIVE:**

- To make the students understand the orientation of different texts in the Restoration and the age of Reason.

**COURSE OUTCOME:**

On the successful completion of the course, students will be able to...

| CO Number | CO Statement  | Knowledge Level (K1-K5)  |
|-----------|---|--------------------------|
| CO1       | Display a working knowledge of the historical and cultural context of British Literature from the Age of Restoration to Augustan Age. | K1<br>Understand         |
| CO2       | Effectively understand and communicate ideas related to the socio-literary upheaval in the era under study.                           | K2<br>Comprehend         |
| CO3       | To identify the distinct features of the emerging forms of literary genres and language.  | K3<br>Remember           |
| CO4       | Analyze literary works for their structure and meaning  | K4<br>Analyze& Synthesis |

**Mapping with Programme Outcomes:**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | S   | S   |
| CO2 | S   | M   | S   | M   | M   |
| CO3 | S   | S   | M   | S   | S   |
| CO4 | S   | M   | S   | S   | M   |

**S- Strong; M – Medium**

**SYLLABUS**

**Unit –I Poetry  
(Detailed)**

**18 Hrs**

John Milton - Paradise Lost: Book IX

**Unit – II Poetry  
(Non-Detailed)**

**18 Hrs**

Thomas Grey - An Elegy Written in a Country Churchyard

John Dryden - Mac Flecknoe

William Blake - A Poison Tree

Robert Burns - For a' That and a' That

**Unit – III – Drama  
(Detailed)**

**18 Hrs**

R.B. Sheridan - The Rivals

**(Non-Detailed)**

Oliver Goldsmith - The Good- Natur'd Man

John Dryden - All for Love

**Unit – IV Fiction**

**18 Hrs**

Samuel Richardson – Pamela

Daniel Defoe - Robinson Crusoe

Henry Fielding – Tom Jones

**Unit – V Prose & Criticism**

**18 Hrs**

Joseph Addison - Sir Roger and Will Wimble

Sir Richard Steele- Sir Roger de Coverley's Portrait Gallery

Alexander Pope - On Epic Poetry

Jonathan Swift - The Battle of The Books

Dr.Johnson - Preface to Shakespeare

**Total Hours: 90**

**Distribution of Marks:** Theory 75% and Internal marks 25%

**TEACHING METHODOLOGY:**

- Classroom Lectures
- Power Point Presentations.
- Screening Movies
- Seminars
- Assignments and tests

**TEXT BOOKS:**

| S.No | Authors        | Title                 | Publishers | Year<br>Publication | Of |
|------|----------------|-----------------------|------------|---------------------|----|
| 1.   | John Milton    | Paradise Lost Book IX | Macmillan  | 1972                |    |
| 2.   | Jonathan Swift | Battle of the Books   | Macmillan  | 2003                |    |
| 3.   | Dryden         | All for Love          | OUP        | 2003                |    |



|    |                        |                                    |            |      |
|----|------------------------|------------------------------------|------------|------|
| 4. | Daniel Defoe           | Robinson Crusoe                    | OUP        | 2006 |
| 5. | De ChickeraDj. Enright | Essays from English Critical Texts | OUP        | 2006 |
| 6. | Samuel Richardson      | Pamela                             | Oxford     | 2008 |
| 7. | Oliver Goldsmith       | The Good- Natur'd Man              | BibiloLife | 2008 |
| 9  | R.B.Sheridan           | The Rivals                         | Macmillan  | 2001 |

#### REFERENCE BOOKS:

| S.NO | AUTHORS               | TITLE  | PUBLISHERS           | YEAR OF PUBLICATION |
|------|-----------------------|--|----------------------|---------------------|
| 1    | Lewis Nathaniel Chase | The English Heroic Plays                       | Forgotten Books      | 2018                |
| 2    | David Robert          | Restoration Plays and Players: An Introduction | CUP                  | 2014                |
| 3    | David Daiches         | A Critical History of English Literature Vol.1 | Supernova Publishers | 2011                |

#### COURSE DESIGNERS:

1. Ms.V.P.Gayathri  
Assistant Professor & Head,
2. Mrs. M. Gayathri,  
Assistant Professor
3. Dr. M. Manimozhi Vinesh  
Assistant Professor

#### THE ROMANTIC AGE

| Sem | Subject Code | Category       | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|----------------|---------|--------------|---------|--------------|-----------|--------|
| I   |              | Core paper III | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 5      |
|     |              |                | 90      | 6            | 90      | 6            |           |        |

#### COURSE OBJECTIVE:

- To give a clear understanding of the flagstones of English Romanticism.

## COURSE OUTCOMES

On the completion of the course, students will be able to

| CO Number | CO Statement  | Knowledge Level (K1-K5) |
|-----------|---|-------------------------|
| CO1       | Focus on the formal and cultural contexts related to the Romantic credo.  | K1 Understand           |
| CO2       | Familiarize themselves with social and political changes and the influence of the Romantic ideals.  | K2 Comprehend           |
| CO3       | Equip themselves with artistic and moral views that also trigger their imagination  | K3 Remember             |
| CO4       | Analyze literary works for their structure and meaning  | K4 Analyze & Synthesis  |
| CO5       | Nurture and develop spiritual affinities with nature and install a sense of compassionate aesthetics that promote social conscience and universality. | K5 Evaluate & Create    |

### Mapping with Programme Outcomes:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | S   | S   |
| CO2 | S   | S   | M   | M   | S   |
| CO3 | S   | M   | S   | S   | M   |
| CO4 | S   | S   | S   | S   | M   |
| CO5 | S   | S   | S   | S   | S   |

**S- Strong; M – Medium**

## SYLLABUS

### Unit – I Poetry (Detailed)

**18 Hrs**

William Wordsworth - Ode on Intimations of Immortality, Tintern Abbey,  
The Solitary Reaper  
John Keats - To Autumn, Ode to Psyche, Ode to a Nightingale  
P.B.Shelley - Ode to the West Wind

### Unit – II Poetry (Non-Detailed)

**18 Hrs**

Samuel Taylor Coleridge - The Rime of the Ancient Mariner  
Lord Byron - When We Two Parted

**Unit – III Drama  
(Detailed)**

**18 Hrs**

P.B.Shelley - Prometheus Unbound

**(Non-Detailed)**

John Millington Barrie - Peter Pan

**Unit – IV Fiction**

**18 Hrs**

Fanny Burney - Evelina

Jane Austen - Emma

Walter Scott - Kenilworth

**Unit – V Prose & Criticism**

**18 Hrs**

Charles Lamb - A Dissertation upon a Roast Pig, Dream Children - A Reverie,  
Old China

William Wordsworth- Preface to the Lyrical Ballads

William Hazlitt - On Going a Journey

Thomas Carlyle - The Hero as Poet (Dante and Shakespeare)

**Total Hours: 90**

**Distribution of Marks:** External Marks 75% and Internal Marks 25%

**TEACHING METHODOLOGY:**

- Classroom Lectures
- Power Point Presentations.
- Screening Movies
- Seminars
- Assignments and tests

**TEXT BOOKS:**

| S.No | Authors                | Title                                    | Publishers        | Year Of Publication |
|------|------------------------|--|-------------------|---------------------|
| 1    | Byron, Shelly, Keats   | The Essential Romantic Poetry Collection | Kindle Edition    | 2009                |
| 2    | ST Coleridge           | The Rime of the Ancient Mariner          | Dover Publication | 2012                |
| 3    | P.B.Shelley            | Prometheus Unbound                       | Aldine House      | 1898                |
| 4    | John Millington Barrie | Peter Pan                                | Inkwater Press    | 2017                |
| 5    | Fanny Burney           | Evelina                                  | Hard Press        | 2018                |
| 6    | Jane Austen            | Emma                                     | Fingerprint       | 2014                |
| 7    | Walter Scott           | Kenilworth                               | Penguin           | 1999                |

|   |                |                  |            |      |
|---|----------------|------------------|------------|------|
| 8 | Charles Lamb   | Essays of Elia   | BiblioLife | 2009 |
| 9 | Thomas Carlyle | The Hero as Poet | Kessinger  | 2005 |

#### REFERENCE BOOKS:

| S.No | Authors       | Title   | Publishers          | Year Of Publication |
|------|---------------|---|---------------------|---------------------|
| 1    | In-House      | English Literature: The Romantic Age                                | Orient Blackswan    | 2016                |
| 2    | Nicola Barber | The Romantic Poets  | Evans Brothers Ltd. | 2000                |
| 3    | Rene Wellek   | History of Modern Criticism, 1750-1950: The Romantic Age v.1& v.2   | Jonathan Cape       | 1966                |
| 4    | Lain McCalman | An Oxford Companion to the Romantic Age: British Culture, 1776-1832 | OUP                 | 2001                |

#### COURSE DESIGNERS:

1. Ms.V.P.Gayathri  
Assistant Professor & Head,
2. Mrs. M. Gayathri,  
Assistant Professor
3. Dr. M. Manimozhi Vinesh  
Assistant Professor

#### THE VICTORIAN AGE

| Sem | Subject Code | Category      | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|---------------|---------|--------------|---------|--------------|-----------|--------|
| I   |              | Core paper IV | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 5      |
|     |              |               | 90      | 6            | 90      | 6            |           |        |

#### COURSE OBJECTIVE:

- To make the students understand the characteristic features of Victorian England and the impact of technology and the new branches of knowledge on literature.

#### COURSE OUTCOMES:

On the successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K5) |
|-----------|--|-------------------------|
| CO1       | Understand the Victorian age and its characteristic loss of faith and the resulting pessimism. | K2<br>Comprehend        |

|     |   |                              |
|-----|---|------------------------------|
| CO2 | Comprehend the features of The Pre-Raphaelite Movement, the Oxford Movement and their poems           | K2<br>Comprehend             |
| CO3 | Appreciate the influence of ever-changing trends brought by scientific and technological developments | K2<br>Comprehend             |
| CO4 | Analyze the diverse literary genres employed by the Victorian writers.                                | K4<br>Analyze &<br>Synthesis |
| CO5 | Gain in-depth understanding of the major writers of the 19 <sup>th</sup> century.                     | K5<br>Evaluate &<br>Create   |

#### **Mapping with Programme Outcomes:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | M          | M          |
| <b>CO3</b> | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | M          | S          | S          | M          |
| <b>CO5</b> | S          | M          | S          | M          | S          |

**S- Strong; M – Medium**

#### **SYLLABUS**

##### **Unit – I Poetry**

###### **(Detailed)**

**18 Hrs**

Robert Browning - A Grammarian's Funeral, Andrea Del Sarto

Alfred Tennyson – Tithonus, The Lady of Shalott

Matthew Arnold – Rugby Chapel, Philomela

##### **Unit – II Poetry**

###### **(Non- Detailed)**

**18 Hrs**

Thomas Hardy - The Darkling Thrush

A.C. Swinburne - Before the Beginning of Years

D.G. Rossetti - The Blessed Damozel

Elizabeth Barrett Browning - How Do I Love Thee?

##### **Unit – III Drama**

###### **(Detailed)**

**18 Hrs**

Oscar Wilde- The Importance of Being Earnest

###### **(Non-Detailed)**

J.M. Synge - The Playboy of the Western World

##### **Unit – IV Prose**

###### **(Detailed)**

**18 Hrs**

Lytton Strachey - Eminent Victorians - Florence Nightingale

###### **(Non – Detailed)**

John Ruskin- Of Queens Gardens from Sesame and Lilies.

##### **Unit – V Fiction**

**18 Hrs**

Charles Dickens- A Tale of Two Cities  
 Elizabeth Gaskell- North and South  
 Emily Bronte - Wuthering Heights.  
 George Eliot – The Mill on the Floss  
 Thomas Hardy- Jude the Obscure

**Total Hours: 90**

**Distribution of Marks:** Theory 75% and Internal marks 25%

**TEACHING METHODOLOGY:**

- Classroom Lectures
- Power Point Presentations.
- Screening Movies
- Seminars
- Assignments and tests

**TEXT BOOKS:**

| S.No | Authors             | Title                            | Publishers              | Year Of Publication |
|------|---------------------|----------------------------------|-------------------------|---------------------|
| 1    | Mountstuart E Grant | The Victorian Anthology          | Forgotten Books         | 2018                |
| 2    | Oscar Wilde         | The Importance of Being Earnest  | Dover                   | 1990                |
| 3    | J.M. Synge          | The Playboy of the Western World | Book Jungle             | 2008                |
| 4    | Charles Dickens     | A Tale of Two Cities             | Vayu Education of India | 2018                |
| 5    | Elizabeth Gaskell   | North and South                  | Cosmo Classics          | 2008                |
| 6    | Emily Bronte        | Wuthering Heights                | Fingerprint Pub.        | 2013                |
| 7    | George Eliot        | The Mill on the Floss            | Fingerprint Pub.        | 2016                |
| 8    | Thomas Hardy        | Jude the Obscure                 | Atlantic                | 1994                |

**REFERENCE BOOKS:**

| S.No | Authors             | Title                                       | Publishers              | Year Of Publication |
|------|---------------------|---|-------------------------|---------------------|
| 1    | V.S.Sethuraman      | Victorian Poets                             | Macmillan               | 2008                |
| 2    | Joseph Bristov (ed) | The Cambridge Companion to Victorian poetry | CUP                     | 2000                |
| 3    | Michael R. Booth    | Theatre in the Victorian Age                | CUP                     | 1991                |
| 4    | G.M. Young          | Victorian England: Portrait of an age       | Reading Essential       | 2018                |
| 5    | Propas, Sharon W.,  | Victorian studies : a research guide        | New York : Garland Pub. | 1992                |

**COURSE DESIGNERS:**

1. Ms.V.P.Gayathri  
Assistant Professor & Head,
2. Mrs. M. Gayathri,  
Assistant Professor
3. Dr. M. Manimozhi Vinesh  
Assistant Professor

### POSTMODERN FICTION

| Sem | Subject Code | Category    | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|-------------|---------|--------------|---------|--------------|-----------|--------|
| I   |              | Elective IA | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 3      |
|     |              |             | 90      | 6            | 90      | 6            |           |        |

#### COURSE OBJECTIVE:

- To make the students appreciate, understand and evaluate the techniques of postmodernism.

#### COURSE OUTCOMES:

On the successful completion of the course, students will be able to,

| CO Number | CO Statement   | Knowledge Level (K1-K5) |
|-----------|--|-------------------------|
| CO1       | Demonstrate knowledge and understanding of a range of postmodern fictional texts within the critical and historical context of postmodernism and post modernity. | K1 Understand           |
| CO2       | Engage with and apply concepts and theories of postmodernism to a number of postmodernist fictional texts.   | K5 Evaluate & Create    |
| CO3       | Ability to analyze meanings and formal qualities of individual texts and group of texts.   | K4 Analyze& Synthesis   |
| CO4       | Recognize the emerging radical changes in the form and technique of the novel  | K2 Comprehend           |

#### Mapping with Programme Outcomes

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | M   | M   |
| CO2 | S   | S   | M   | M   | M   |
| CO3 | S   | S   | M   | S   | M   |
| CO4 | S   | S   | S   | M   | M   |

**S- Strong; M – Medium**

#### SYLLABUS

**Unit -I****18 Hrs**

Pastiche, Parody, Irony, Playfulness, Black Humor, Intertextuality, Metafiction, Fabulation, Poiumena, Historiographic Metafiction, Temporal Distortion, Magic Realism, Technoculture And Hyperreality, Paranoia, Maximalism, Minimalism Jean-François Lyotard-The Postmodern Condition

**Unit-II****18 Hrs**

Thomas Pynchon-Gravity's Rainbow

**Unit-III****18 Hrs**

Jorge Luis Borges - The Book of Sand

**Unit-IV****18 Hrs**

Italo Calvino- If on a Winter's Night a Traveler

**Unit-V****18 Hrs**

Marquez-One Hundred Years of Solitude

**Total Hours: 90**

**Distribution of Marks:** Theory 100% and Problems 0%

**TEACHING METHODOLOGY:**

- Classroom Lectures
- Power Point Presentations.
- Screening Movies
- Seminars
- Assignments and tests

**TEXT BOOKS:**

| S.No | Authors                | Title                             | Publishers                       | Year Of Publication |
|------|------------------------|-----------------------------------|----------------------------------|---------------------|
| 1    | M.H.Abrams             | A Glossary of Literary Terms      | Cengage learning India Pvt. Ltd. | 2015                |
| 2    | Thomas Pynchon         | Gravity's Rainbow                 | The Penguin Press, New York      | 2012                |
| 3    | Jorges Luis Borges     | The Book of Sand                  | E.P.Dutton                       | 1975                |
| 4    | Italo Calvino          | If on a Winter's Night a Traveler | Houghton Mifflin Harcourt        | 1979                |
| 5    | Gabriel Garcia Marquez | One Hundred Years of Solitude     | Penquin Books                    | 1967                |



**REFERENCE BOOKS:**

| S.No | Authors         | Title  | Publishers                 | Year Of Publication |
|------|-----------------|--|----------------------------|---------------------|
| 1    | Brain McHale    | The Cambridge Introduction to Postmodernism              | Cambridge University Press | 2015                |
| 2    | Kishore Ram     | Post Modernism in English Literature                     | Sonali Publications        | 2011                |
| 3    | Jim Powell      | Postmodernism for Beginners                              | Orient Blackswan           | 2001                |
| 4    | Fredric Jameson | Postmodernism, or, The Cultural Logic of Late Capitalism | Duke University Press      | 2012                |

**COURSE DESIGNERS:**

1. Ms.V.P.Gayathri  
Assistant Professor & Head,
2. Mrs. M. Gayathri,  
Assistant Professor
3. Dr. M. Manimozhi Vinesh  
Assistant Professor

**GENRE FICTION**

| Sem | Subject Code | Category     | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|--------------|---------|--------------|---------|--------------|-----------|--------|
| I   |              | Elective I B | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 3      |
|     |              |              | 90      | 6            | 90      | 6            |           |        |

**COURSE OBJECTIVES:**

- To differentiate between high brow fiction and popular fiction.
- To give a general understanding of what constitutes the “popular”.

**COURSE OUTCOMES**

On the successful completion of the course, students will be able to,

| CO Number | CO Statement   | Knowledge Level (K1-K5) |
|-----------|--|-------------------------|
| CO1       | Understand the characteristic features of genre fiction                                  | K1 Understand           |
| CO2       | Evaluate the varieties of genre fiction like Thriller and psychological thriller fiction | K3 Remember             |

|     |  |                                     |
|-----|--|-------------------------------------|
| CO3 | Distinguish what constitutes Popular and High-brow Fiction | K4<br>Analyze                       |
| CO4 | Identify the “popular” elements in the prescribed texts    | K2 & K3<br>Comprehend<br>& Remember |

### Mapping with Programme Outcomes

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | S   | S   |
| CO2 | S   | S   | S   | S   | M   |
| CO3 | S   | M   | S   | S   | M   |
| CO4 | S   | S   | M   | M   | S   |

**S- Strong; M – Medium**

## SYLLABUS

### UNIT-I

**18 Hrs**

What is Genre Fiction?

Characteristic features of genre fiction

### Unit-II

**18 Hrs**

Daphne Du Maurier- Rebecca

Michael Crichton- Disclosure

### Unit-III

**18 Hrs**

John Grisham- The Client

Stieg Larsson- The Girl with the Dragon Tattoo

### Unit-IV

**18 Hrs**

Arthur Golden- Memoirs of a Geisha

Dan Brown- The Da Vinci Code

### Unit-V

**18 Hrs**

J. K. Rowling- Harry Potter (The Prisoner of Azkaban)

Gillian Flynn- Gone Girl

**Total Hours: 90**

**Distribution of Marks:** Theory 75% and internal marks 25%

### TEACHING METHODOLOGY:

- Classroom Lectures
- Power Point Presentations.
- Screening Movies
- Seminars
- Assignments and tests

#### TEXT BOOKS:

| S.No | Authors           | Title                                  | Publishers      | Year Of Publication |
|------|-------------------|--|-----------------|---------------------|
| 1    | Daphne du Maurier | Rebecca                                | Victor Gollancz | 1938                |
| 2    | Michael Crichton  | Disclosure                             | Arrow           | 1994                |
| 3    | John Grisham      | The Client                             | Doubleday       | 1993                |
| 4    | Stieg Larsson     | The Girl with the Dragon Tattoo        | Vintage Crime   | 2011                |
| 5    | Arthur Golden     | Memoirs of a Geisha                    | Alfred A. Knopf | 1997                |
| 6    | Dan Brown         | The Da Vinci Code                      | Doubleday       | 2003                |
| 7    | J.K. Rowling      | Harry Potter (The Prisoner of Azkaban) | Bloomsbury      | 1999                |
| 8    | Gillian Flynn     | Gone Girl                              | Crown           | 2012                |

#### REFERENCE BOOKS:

| S.No | Authors              | Title   | Publishers      | Year Of Publication |
|------|----------------------|---|-----------------|---------------------|
| 1    | John Clute           | The Encyclopedia of Science Fiction           | Orbit           | 1999                |
| 2    | Richard Bleiler      | Supernatural Fiction Writers                  | Bloomsbury      | 2002                |
| 3.   | Peter Melville Logan | <a href="#">The Encyclopedia of the Novel</a> | Wiley Blackwell | 2014                |

#### COURSE DESIGNERS:

- Ms.V.P.Gayathri  
Assistant Professor & Head,
- Mrs. M. Gayathri,  
Assistant Professor
- Dr. M. Manimozhi Vinesh  
Assistant Professor

#### INTENSIVE STUDY OF AN AUTHOR-AMITAV GHOSH

| Sem | Sub Code | Category   | Lecture |           | Theory  |           | Practical | Credit |
|-----|----------|------------|---------|-----------|---------|-----------|-----------|--------|
|     |          |            | Hrs P/W | Hrs P/Sem | Hrs P/W | Hrs P/Sem |           |        |
| I   |          | Self study | -       | -         | -       | -         | -         | 2      |

#### COURSE OBJECTIVES:

- This course aims to study an author Viz., Amitav Ghosh in relation to contemporary Indian writing in English and the post colonial thematic of diasporic literature.
- To enable the students to study independently using the wide range of resources available with minimum teacher interface.

### **COURSE OUTCOMES:**

On the successful completion of the course students will be able to,

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K5)</b>   |
|------------------|--|----------------------------------|
| CO1              | Develop and exhibit a thorough knowledge of the oeuvre by Amitav Ghosh     | <b>K1member</b>                  |
| CO2              | Identify and analyze the themes that run through Ghosh's works             | <b>K2 Understand</b>             |
| CO3              | Exhibit a systematic knowledge of the stylistic devices employed by Ghosh. | <b>K3 Apply</b>                  |
| CO4              | Write a critical overview of Ghosh's works.                                | <b>K4 Analyze&amp; Synthesis</b> |

### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | M          | S          |
| <b>CO2</b> | S          | S          | M          | S          | M          |
| <b>CO3</b> | M          | M          | S          | S          | M          |
| <b>CO4</b> | M          | S          | S          | S          | S          |

***S- Strong; M - Medium***

## **SYLLABUS**

### **UNIT –I**

General Topic: History and Narrative

The Shadow Lines

### **UNIT – II**

General Topic: Science Fiction, Historic Sensibility

The Calcutta Chromosome

The Glass Palace

### **UNIT- III**

General Topic: Colonial and Post –Colonial discourse

## The Ibis Trilogy

### UNIT- IV

General Topic: Myth and Ecological Concerns

The Hungry Tide

### UNIT-V

Author as an Anthropologist

Any Five Essays from “ In an Antique Land”

### TEACHING METHODOLOGY

- Classroom Lectures
- PowerPoint
- Screening Movies
- Seminars
- Assignments, Tests

### TEXT BOOKS:

| S.No | Authors      | Title                   | Publishers     | Year of Publication |
|------|--------------|-------------------------|----------------|---------------------|
| 1    | Amitav Ghosh | The Shadow Lines        | Penguin India  | 2009                |
| 2    | Amitav Ghosh | The Calcutta Chromosome | Penguin India  | 2009                |
| 3    | Amitav Ghosh | In an Antique Land      | Penguin India  | 2009                |
| 4    | Amitav Ghosh | The Hungry Tide         | Harper Collins | 2016                |

### REFERENCE BOOKS:

| S.No | Authors            | Title                         | Publishers              | Year of Publication |
|------|--------------------|-------------------------------|-------------------------|---------------------|
| 1    | Hawley, John, C    | Amitav Ghosh: An Introduction | Delhi: Foundation Books | 2005                |
| 2    | Dirks, Nicholas B  | Colonialism and Culture.      | Ann Arbor               | 1992                |
| 3    | Choudhury, Bibhash | Amitav Ghosh: Critical Essays | PHI Learning Pvt.Ltd    | 2015                |

### WEB SOURCES:

1. <https://www.litcharts.com/lit/the-shadow-lines/summary>
2. <https://www.boloji.com/articles/12222/the-calcutta-chromosome>
3. [http://www.academia.edu/7538983/Review\\_of\\_Amitav\\_Ghosh\\_s\\_The\\_Imam\\_and\\_the\\_Indian](http://www.academia.edu/7538983/Review_of_Amitav_Ghosh_s_The_Imam_and_the_Indian)

4. <https://ashvamegh.net/the-hungry-tide-by-amitav-ghosh-human-nature/>

**COURSE DESIGNERS:**

1. Ms.V.P.Gayathri  
Assistant Professor & Head,
2. Mrs. M. Gayathri,  
Assistant Professor
3. Dr. M. Manimozhi Vinesh  
Assistant Professor
4. S.Tamil Elakkiya  
Assistant Professor

**RUSSIAN LITERATURE IN THE 19<sup>TH</sup> CENTURY**

| SEM | SUB CODE | CATEGORY   | LECTURE |           | THEORY  |           | PRACTICAL | CREDIT |
|-----|----------|------------|---------|-----------|---------|-----------|-----------|--------|
|     |          |            | HRS P/W | HRS P/SEM | HRS P/W | HRS P/SEM |           |        |
| I   |          | Self Study | -       | -         | -       | -         | -         | 2      |

**COURSE OBJECTIVES:**

- The course is designed to familiarize the learners with the wide variety of 19th century Russian Literature by reading the popular works of the period.
- The learners get an overall knowledge about the Golden Age of Russian Literature that contributed to World Literature.

**COURSE OUTCOMES:**

On the successful completion of the course students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K5) |
|-----------|--|-------------------------|
| CO1       | Have a broad knowledge of the variety of Russian writings and understand the cultural diversity reflected in them. | <b>K1 Remember</b>      |
| CO2       | Identify and describe the unique literary tendencies evident in the different translated texts from Russia.        | <b>K2 Understand</b>    |
| CO3       | Elaborate and improve on the different types of creative genius from around the world                              | <b>K3 Apply</b>         |
| CO4       | Equip themselves with artistic and moral views, trigger their  | <b>K4</b>               |

|  |   |                                   |
|--|---|-----------------------------------|
|  | imagination and aesthetics in various genres of Russian Literature. | <b>Analyze&amp;<br/>Synthesis</b> |
|--|---|-----------------------------------|

### MAPPING WITH PROGRAMME OUTCOMES

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | M          | S          |
| <b>CO2</b> | S          | M          | S          | S          | M          |
| <b>CO3</b> | S          | M          | M          | M          | M          |
| <b>CO4</b> | M          | M          | S          | S          | S          |

**S- Strong; M – Medium**

### SYLLABUS

#### UNIT –I Short Story

|                |                         |
|----------------|-------------------------|
| A.S. Pushkin   | - Station Master        |
| Nikolai Gogol  | - The Overcoat.         |
| L.N. Tolstoy   | - Krutzer Sonata        |
| Anton Chekhov  | - Death of a Clerk.     |
| Dina Rubina    | - The Black Thorn.      |
| Alexei Tolstoy | - The Russian character |

#### UNIT – II Fiction

|                   |                        |
|-------------------|------------------------|
| F.M. Dostoyevski  | - Crime and Punishment |
| Leo Tolstoy       | - Anna Karenina        |
| Mikhail Lermontov | - A Hero of Our Time   |
| Nikolai Gogol     | - Dead Souls           |
| Maxim Gorky       | - Mother               |

#### UNIT- III Plays

|                    |                       |
|--------------------|-----------------------|
| The Cherry Orchard | - Anton Chekhov       |
| Maxim Gorky        | - Children of the Sun |
| Alexei K. Tolstoy  | - Don Juan            |
| Nina Sadur         | - Frozen.             |

#### UNIT- IV Poetry

|                   |   |
|-------------------|---|
| Anna Akamatova    | - Requiem, Twenty-First. Night. Monday  |
| Fyodor Tyutchev   | - You will not Grasp her with your mind |
| Mikhail Lermontov | - Borodino                              |
| Nikolai Nekrasov  | - Poet and Citizen                      |
| A.S. Pushkin      | - Eugene Onegin (Book –I Cantos 1-2)    |

### TEACHING METHODOLOGY

- Self study

- Guidance through references.

#### REFERENCE BOOKS:

| S.No | Authors         | Title  | Publishers           | Year of Publication |
|------|-----------------|--|----------------------|---------------------|
| 1    | Nilcolai Atarov | Anthology of Soviet Short Stroies              | Progress Publishers  | 1976                |
| 2    | Dr.S.Nirmala    | Voices – Selections from Russian Women’s Prose | Dept. of Russian     | 2009                |
| 3    | Rosalind Marsh  | Gender and Russian Literature                  | Cambridge University | 1996                |
| 4    | Toby. W. Clyman | Women Writers in Russian Literature            | London               | 1998                |

#### WEB SOURCES:

<https://theculturetrip.com/europe/russia/articles/10-poems-that-define-russian-literature/>  
<https://www.ranker.com/list/famous-poets-from-russia/reference?page=2>  
[http://famouspoetsandpoems.com/country-6/Russia/19th\\_century\\_Russian\\_poets.html](http://famouspoetsandpoems.com/country-6/Russia/19th_century_Russian_poets.html)

#### Course Designers:

Ms.V.P.Gayathri  
Assistant Professor & Head,

Mrs. M. Gayathri,  
Assistant Professor

Mrs. R.Sarathy  
Assistant Professor

### 20<sup>TH</sup> CENTURY LITERATURE

| Sem | Subject Code | Category     | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|--------------|---------|--------------|---------|--------------|-----------|--------|
| II  |              | Core paper I | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 5      |
|     |              |              | 90      | 6            | 90      | 6            |           |        |

#### COURSE OBJECTIVE:

- To teach the cultural and literary nuances of the Twentieth Century and have a broad understanding of Modernism.

#### COURSE OUTCOMES

On the successful completion of the course, students will be able to...



| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K5)</b> |
|------------------|--|--------------------------------|
| CO1              | Acquire a working understanding of Modernism as a literary movement , the war years and their literary consequences.                 | K1<br>Understand               |
| CO2              | Effectively understand and communicate ideas related to the dominant literary traditions and authors of the 20 <sup>th</sup> century | K2<br>Comprehend               |
| CO3              | Identify and describe distinct literary characteristics of English Literature of 20 <sup>th</sup> century                            | K3<br>Remember                 |
| CO4              | Analyze and appreciate the various emerging literary trends .  | K4<br>Analyze&<br>Synthesis    |

#### **Mapping with Programme Outcomes:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | M          | S          |
| <b>CO2</b> | S          | S          | S          | M          | M          |
| <b>CO3</b> | M          | S          | S          | S          | M          |
| <b>CO4</b> | S          | M          | S          | S          | M          |

**S- Strong; M – Medium**

#### **SYLLABUS**

##### **Unit – I Poetry**

**(Detailed)**

**18 Hrs**

G.M. Hopkins - The Wind hover, God's Grandeur

W.B.Yeats - Easter 1916, Byzantium, Sailing to Byzantium

T.S. Eliot - The Love Song of J. Alfred Prufrock

The Wasteland

##### **Unit – II Poetry**

**(Non- Detailed)**

**18 Hrs**

Louis MacNeice - Prayer Before Birth

Dylan Thomas - Poem in October

Charles Madge - Ode

Wilfred Owen – Insensibility

Philip Larkin – The Whitsun Weddings

Ted Hughes – The Thought –Fox

##### **Unit – III Drama**

**(Detailed)**

**18 Hrs**

G.B Shaw – Pygmalion

T.S.Eliot- Murder in the Cathedral

**(Non-Detailed)**

Samuel Beckett- Waiting for Godot

Harold Pinter - The Birthday Party

**Unit – IV Prose & Criticism****(Detailed)****18 Hrs**

D.H. Lawrence - Why the Novel Matters

**(Non-Detailed)**

Robert Lynd - The Unexpected

**Unit – V Fiction****18 Hrs**

Somerset Maugham - The Moon and the Sixpence

Virginia Woolf- Mrs. Dalloway

George Orwell- 1984

James Joyce- Ulysses

Iris Murdoch – The Sea, the Sea.

**Total Hours: 90**

**Distribution of Marks:** Theory 75% and Internal Marks 25%

**TEACHING METHODOLOGY:**

- Classroom Lectures
- Power Point Presentations.
- Screening Movies
- Seminars
- Assignments and tests

**TEXT BOOKS:**

| S.No | Authors          | Title  | Publishers      | Year Of Publication |
|------|------------------|--|-----------------|---------------------|
| 1    | Michael Hulse    | The 20 <sup>th</sup> Century Poetry                            | Ebury Digital   | 2012                |
| 2    | Michael Schmidt  | The Harvill Book of 20 <sup>th</sup> century poetry in English | Random House    | 2000                |
| 3    | G.B.Shaw         | Pygmalion  | Bloomsbury      | 2014                |
| 4    | T.S.Eliot        | Murder in the Cathedral  | Mariner Books   | 1964                |
| 5    | Harold Pinter    | The Birthday Party   | Faber           | 1991                |
| 6    | Samuel Beckett   | Waiting for Godot  | Pearson         | 2012                |
| 7    | Somerset Maugham | The Moon and Sixpence  | Serenity Pub.   | 2008                |
| 8    | Virginia Woolf   | Mrs. Dalloway  | Fingerprint Pub | 2017                |
| 9    | George Orwell    | 1984   | Amazing Reads   | 2014                |
| 10   | James Joyce      | Ulysses  | Value Educ.     | 2019                |

**REFERENCE BOOKS:**

| S.No | Authors        | Title  | Publishers       | Year Of Publication |
|------|----------------|--|------------------|---------------------|
| 1    | M.S.Nagarajan  | English Literary Criticism and Theory                                  | Orient Blackswan | 2006                |
| 2    | Jenny Stringer | The Oxford Companion to 20 <sup>th</sup> Century Literature in English | OUP              | 1996                |

|   |                         |   |                  |      |
|---|-------------------------|---|------------------|------|
| 3 | <u>Brian W. Shaffer</u> | The Encyclopedia of Twentieth-Century Fiction | Wiley-Blackwell; | 2011 |
|---|-------------------------|---|------------------|------|

**COURSE DESIGNERS:**

1. Ms.V.P.Gayathri  
Assistant Professor & Head,
2. Mrs. M. Gayathri,  
Assistant Professor
3. Dr. M. Manimozhi Vinesh  
Assistant Professor

**AMERICAN LITERATURE**

| Sem | Subject Code | Category      | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|---------------|---------|--------------|---------|--------------|-----------|--------|
| II  |              | Core paper VI | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 5      |
|     |              |               | 90      | 6            | 90      | 6            |           |        |

**COURSE OBJECTIVE:**

- To provide a fair understanding of American literature is distinct from English literature , in the ways it handles English, its peculiar literary nuances and themes, the American dream and philosophy.

**COURSE OUTCOMES:**

On the successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K5) |
|-----------|--|-------------------------|
| CO1       | Interpret the American spirit, moral earnestness, and understand the tradition and society as identified from the works. | K2                      |
| CO2       | Analyze and infer the philosophic principles from the works  | K4                      |
| CO3       | Assess the speech, life and dreams of America as reflected in the literary works   | K5                      |
| CO4       | Identify the varied responses that are earned through reading the creative works   | K1                      |
| CO5       | Analyze the wide variety of experiences and attitudes in contemporary American society through the works and             | K3                      |

|  |   |  |
|--|---|--|
|  | will be able to convincingly write supportive arguments |  |
|--|---|--|

### Mapping with Programme Outcomes:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | S   | S   |
| CO2 | S   | S   | S   | M   | M   |
| CO3 | M   | S   | M   | S   | M   |
| CO4 | M   | M   | S   | S   | M   |
| CO5 | M   | M   | M   | S   | S   |

**S- Strong; M – Medium**

## SYLLABUS

### Unit I Poetry

**18 Hrs**

- Edgar Allan Poe - Annabel Lee
- Emily Dickinson - After a great pain, a formal feeling comes
  - This was a Poet, It is That
  - I Felt a Funeral in My Brain
  - I Heard a Fly Buzz When I Died
- R.W.Emerson - Brahma
- Walt Whitman - When Lilacs Last in the Dooryard Bloom'd
- Robert Frost - After Apple Picking

### UNIT-II Poetry

**18 Hrs**

- Wallace Stevens - The Emperor of Ice cream
- E.E.Cummings – Anyone Lived in a Pretty How town
- E.A.Robinson – Richard Cory
- Richard Lowell- For the Union Dead
- Sylvia Plath- Daddy
- Carl Sandberg- Chicago
- Allen Ginsberg – America

### Unit III Drama

**18 Hrs**

- Eugene O'Neill – A Long Day's Journey into Night
- Arthur Miller – All My Sons

### Unit IV Prose

**18 Hrs**

- Robert Frost – The Figure a Poem Makes
- Henry James – The Art of Fiction

### UNIT V Fiction

**18 Hrs**

- Herman Melville – The Scarlet Letter
- Mark Twain – The Adventures of Huckleberry Finn
- John Steinbeck - The Grapes of Wrath
- Scott Fitzgerald – The Great Gatsby
- J.D.Salinger - The Catcher in the Rye

**Total Hours: 90**

**Distribution of Marks:** Theory 75% and internal marks 25%

**TEACHING METHODOLOGY:**

- Classroom Lectures
- Power Point Presentations.
- Screening Movies
- Seminars
- Assignments and tests

**TEXT BOOKS:**

| S.No | Authors  | Title   | Publishers                                    | Year Of Publication |
|------|--|---|---|---------------------|
| 1.   | Poems and prose can be taken from any authentic source |   |   |                     |
| 2.   | Ed. William J. Fisher                                  | An Anthology: American Literature of the Nineteenth Century                               | Eurasia Publishing House Pvt. Ltd., New Delhi | 2002                |
| 3.   | Sullivan, Nancy  | The Treasury of American Poetry (Prescribed Poems)  | Doubleday & Co., Inc, NY                      | 1978                |
| 4.   | Hawthorne, Nathaniel                                   | The Scarlet Letter  | Bantam Books                                  | 1981                |
| 5.   | Eugene O'Neill   | A Long Day's Journey into Night   | Any Reputed Publisher                         |                     |
| 6.   | Arthur Miller  | All My Sons   | Any Reputed Publisher                         |                     |
| 7.   | Mark Twain   | The Adventures of Huckleberry Finn  | Any Reputed Publisher                         |                     |
| 8.   | John Steinbeck   | The Grapes of Wrath   | Any Reputed Publisher                         |                     |
| 9.   | J.D.Salinger-  | The Catcher in the Rye  | Any Reputed Publisher                         |                     |
| 10.  | Ed. Egbert S.Oliver                                    | An Anthology: American Literature 1890-1965   | Eurasia Publishing House Pvt. Ltd., New Delhi | 2002                |
| 11.  | John Disky (ed)  | Critical essays on Steinback's "The Grapes of Wrath".                                     | Boston.G.K. Hall                              | 1989                |
| 12.  | Marvin Laser and Norman Fruman                         | Studies in J.D.Salinger: review, essays and critiques of The Catcher in the Rye and other | Odyssey Press, New York                       | 1963                |

|  |  |          |  |  |
|--|--|----------|--|--|
|  |  | fiction. |  |  |
|--|--|----------|--|--|

#### REFERENCE BOOKS:

| S.No | Authors        | Title  | Publishers              | Year Of Publication |
|------|----------------|--|-------------------------|---------------------|
| 1    | Hoffman Daniel | Harvard Guide to Contemporary American Writing | Oxford University Press | 1979                |
| 2    | Ed. Subbian C  | An Anthology of Poems                          | Emerald Publications    | 1987                |

#### COURSE DESIGNERS:

1. Ms.V.P.Gayathri  
Assistant Professor & Head,
2. Mrs. M. Gayathri,  
Assistant Professor
3. Dr. M. Manimozhi Vinesh  
Assistant Professor
4. Mrs. D. Ramya  
Assistant Professor

#### INTRODUCTION TO WORLD LITERATURE

| Sem | Subject Code | Category       | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|----------------|---------|--------------|---------|--------------|-----------|--------|
| II  |              | Core paper VII | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 5      |
|     |              |                | 90      | 6            | 90      | 6            |           |        |

#### COURSE OBJECTIVE:

- To familiarize students to literary classics from around the world and make them appreciate the idea of world literature.

#### COURSE OUTCOMES:

On the successful completion of the course, students will be able to

| CO | CO Statement | Knowledge |
|----|--------------|-----------|
|----|--------------|-----------|

| Number |  | Level<br>(K1-K5) |
|--------|--|------------------|
| CO1    | Select and define the literary works at varied levels of comprehension.                                      | K1               |
| CO2    | Practically interpret, illustrate and apply any literary work by identifying different aspects of literature | K2 & 3           |
| CO3    | Examine the text intensively and distinguish its salient features  | K4               |
| CO4    | The evolution of creative genius around the World  | K5               |

### Mapping with Programme Outcomes:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | M   | M   | S   | S   | S   |
| CO2 | S   | M   | S   | M   | M   |
| CO3 | S   | S   | M   | S   | M   |
| CO4 | M   | S   | S   | S   | M   |

**S- Strong; M – Medium**

### SYLLABUS

#### UNIT - I Poetry

**18 Hrs**

The Epic of Gilgamesh  
Beowulf  
Luis de Camoes - The Luciads

#### UNIT II Poetry

**18 Hrs**

Kalidasa - Meghadhoot  
R. Parthasarathy- Silappathikaram: The Tale of an Anklet  
Dante – The Divine Comedy Cantos 1,2,3 & 4  
The Rubaiyat Omar Khayyam  
Goethe – Faust Part I  
Okot P. Bitek -Song of Lawino

#### UNIT III Drama

**18 Hrs**

Sophocles – Oedipus Rex  
Moliere – The Miser

#### UNIT IV Short Stories

**18 Hrs**

Anton Chekhov – The Bet  
Jean Paul Sartre – The Wall  
Nikolai Gogol – The Cloak  
G.Garcia Marquez – Balthazaar’s Marvellous Afternoon  
Isamat Chugtai – The Quilt  
Ryonosuke Akutagawa - In a Grove  
Sadat Hasan Manto – Toba Tek Singh

#### UNIT V Fiction

**18 Hrs**

Voltaire - Candide  
 Victor Hugo – Les Miserables  
 Leo Tolstoy – Anna Karenina  
 Franz Kafka- The Trial  
 Orhan Pamuk – My Name is Red

**Total Hours: 90**

**TEACHING METHODOLOGY:**

- Classroom Lectures
- Power Point Presentations.
- Screening Movies
- Seminars
- Assignments and tests

**TEXT BOOKS:**

| S.No | Authors  | Title          | Publishers            | Year Of Publication |
|------|--|----------------|-----------------------|---------------------|
| 1    | Poems , prose and short stories can be taken from any authentic source |                |                       |                     |
| 2    | Franz Kafka  | The Trial      | Any Reputed Publisher |                     |
| 3    | Leo Tolstoy  | Anna Karenina  | Any Reputed Publisher |                     |
| 4    | Orhan Pamuk  | My Name is Red | Any Reputed Publisher |                     |
| 5    | Voltaire   | Candide        | Any Reputed Publisher |                     |
| 6    | Victor Hugo  | Les Miserables | Any Reputed Publisher |                     |
| 7    | Sophocles  | Oedipus Rex    | Any Reputed Publisher |                     |
| 8    | Moliere  | The Miser      | Any Reputed Publisher |                     |

**REFERENCE BOOKS:**

| S.No | Authors                   | Title   | Publishers                      | Year Of Publication |
|------|---------------------------|---|---------------------------------|---------------------|
| 1    | Barman,<br>Bhaskar<br>Roy | E L Dorado: An Anthology<br>of World Literature | Authors Press<br>Global Network | 2006                |

**COURSE DESIGNERS:**

1. Ms.V.P.Gayathri  
Assistant Professor & Head,
2. Mrs. M. Gayathri,  
Assistant Professor



3. Dr. M. Manimozhi Vinesh  
Assistant Professor

### INDIAN LITERATURE IN ENGLISH

| Sem | Subject Code | Category        | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|-----------------|---------|--------------|---------|--------------|-----------|--------|
| II  |              | Core paper VIII | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 5      |
|     |              |                 | 90      | 6            | 90      | 6            |           |        |

#### COURSE OBJECTIVE:

- To trace the evolution and analyze Indian Writing in English, the Indian ethos, the various social upheavals as reflected in Indian Literature in English.

#### COURSE OUTCOMES:

On the successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K5) |
|-----------|--|-------------------------|
| .CO1      | Understand the nuances of Indian Writing in English  | K1                      |
| CO2       | Interpret and demonstrate their understanding of various facets of Indian English.                                 | K3                      |
| CO3       | Effectively understand and communicate ideas related to Indian Writing in English with its background and settings | K2                      |
| CO4       | Appreciate and write critical reviews of Indian Writing in English   | K6                      |

#### Mapping with Programme Outcomes:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | S   | S   |
| CO2 | M   | S   | S   | M   | M   |
| CO3 | M   | M   | S   | S   | M   |
| CO4 | M   | M   | M   | S   | S   |

**S- Strong; M – Medium**

#### Unit-I Poetry

**18 Hrs**

Rabindranath Tagore- Gitanjali  
Sarojini Naidu – The Palanquin Bearers  
R. Pathasarathy- Exile

A.K. Ramanujan- Epitaph on A Street Dog  
 Shiv K. Kumar- Indian Woman  
 Jayanta Mahapatra-Grandfather  
 Arun Kolatkar-Sarpasatra

Keki N. Daruwalla -Boat Ride along the Ganga

## Unit-II Prose

18 Hrs

Salman Rushdie- Imaginary Homelands from Imaginary Homelands  
 Amitav Ghosh – The Ghat of the Only World – From The Imam and the Indian  
 Shashi Tharoor- NRI's : “Never Relinquished India” or “Not Really Indian” From India : From  
 Midnight to Millennium

## Unit-III Drama

18 Hrs

Grish Karnad- Hayavadana  
 Mahesh Dattani-Final Solutions

## Unit-IV Short Stories

18 Hrs

R.K.Narayan – Iswaran from Malgudi Days  
 Ruskin Bond- The Blue Umbrella  
 Jhumpa Lahiri- The Interpreter of Maladies

## UNIT V Fiction

18 Hrs

Khushwant Singh- Train To Pakistan  
 Vikram Seth – A Suitable Boy  
 Kiran Desai – The Inheritance of Loss  
 Salman Rushdie – Midnight's Children  
 Gita Mehta – River Sutra

**Total Hours: 90**

## TEACHING METHODOLOGY:

- Classroom Lectures
- Power Point Presentations.
- Screening Movies
- Seminars
- Assignments and tests

## TEXT BOOKS:

| S.No | Authors  | Title                   | Publishers            | Year Of Publication |
|------|--|-------------------------|-----------------------|---------------------|
| 1    | Poems and prose can be taken from any authentic source |                         |                       |                     |
| 2    | Amitav Ghosh   | The Imam and the Indian | Penguin               | 2010                |
| 3    | Khushwant Singh  | Train To Pakistan       | Any Reputed Publisher |                     |
| 4    | Vikram Seth  | A Suitable Boy          | Any Reputed Publisher |                     |

|   |                 |                         |                       |      |
|---|-----------------|-------------------------|-----------------------|------|
| 5 | Kiran Desai     | The Inheritance of Loss | Any Reputed Publisher |      |
| 6 | Salman Rushdie  | Midnight's Children     | Any Reputed Publisher |      |
| 7 | Gita Mehta      | River Sutra             | Any Reputed Publisher |      |
| 8 | Dattani, Mahesh | Collected Plays         | Penguin               | 2000 |

#### REFERENCE BOOKS:

| S.No | Authors                      | Title   | Publishers                          | Year Of Publication |
|------|------------------------------|---|-------------------------------------|---------------------|
| 1    | Chavan P<br>Sunanda          | <i>The Fair Voice: A Study of Indian Women Poets in English</i> | Sterling Publishers Private Limited | 1984                |
| 2    | Iyengar,<br>Srinivasa<br>K.R | <i>Indian Writing in English</i>                                | Sterling Publishers Private Limited | 1962                |

#### Course Designers:

1. Ms.V.P.Gayathri  
Assistant Professor & Head,
2. Mrs. M. Gayathri,  
Assistant Professor
3. Dr. M. Manimozhi Vinesh  
Assistant Professor

### DETECTIVE AND SPY FICTION

| Sem | Subject Code | Category     | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|--------------|---------|--------------|---------|--------------|-----------|--------|
| II  |              | Elective IIA | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 3      |
|     |              |              | 60      | 4            | 60      | 4            |           |        |

#### COURSE OBJECTIVE:

- To make the students learn the evolution of detective fiction and to trace the emergence of noir and the hard boiled detective.

#### COURSE OUTCOMES :

On the successful completion of the course, students will be able to

| CO | CO Statement | Knowledge |
|----|--------------|-----------|
|----|--------------|-----------|

| Number |  | Level<br>(K1-K5) |
|--------|--|------------------|
| CO1    | To understand the effect of the sensational on the populace and the evolution of detective fiction.                          | K2               |
| CO2    | Examine the texts intensively and distinguish its salient features arriving at a knowledge of what constitutes crime fiction | K4               |
| CO3    | To trace the emergence of the hardboiled detective from the earlier types.   | K1 & 4           |
| CO4    | To appreciate and write critical reviews of detective, thriller and spy fiction.   | K6               |

### Mapping with Programme Outcomes:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | S   | S   |
| CO2 | S   | S   | S   | S   | L   |
| CO3 | M   | M   | S   | S   | M   |
| CO4 | M   | M   | M   | S   | S   |

**S- Strong; M – Medium**

#### UNIT-I

**18 Hrs**

History of Detective/ Crime Fiction

Penny dreadful/ blood

Locked room mysteries

Golden Age of Detective Fiction

Hard boiled / Noir Fiction

The Black Mask

Raymond Chandler- The Simple Art of Murder, Introduction to “Trouble Is My Business”

W.H. Auden -The Guilty Vicarage- Notes on the Detective story

#### UNIT-II

**18 Hrs**

Edgar Allan Poe- Murders in the Rue Morgue

Wilkie Collins- The Moonstone

#### UNIT-III

**18 Hrs**

Sir

Arthur Conan Doyle – A Study in Scarlet

R. Austin Freeman- The Eye of Osiris

#### UNIT -IV

**18 Hrs**

Maurice le Blanc – The Crystal Stopper

Agatha Christie – 4.50 from Paddington

#### UNIT -V

**18 Hrs**

Dashiell Hammett – The Maltese Falcon

Raymond Chandler – The Long Goodbye

**Total Hours: 90**

**TEXT BOOKS:**

| S.No | Authors                | Title                     | Publishers            | Year Of Publication |
|------|------------------------|---------------------------|-----------------------|---------------------|
| 1.   |                        |                           |                       |                     |
| 2.   | Edgar Allan Poe        | Murders in the Rue Morgue | Any Reputed Publisher |                     |
| 3.   | Wilkie Collins         | The Moonstone             | Any Reputed Publisher |                     |
| 4.   | Sir Arthur Conan Doyle | A Study in Scarlet        |                       |                     |
| 5.   | R. Austin Freeman      | The Eye of Osiris         | Any Reputed Publisher |                     |
| 6.   | Maurice le Blanc       | The Crystal Stopper       | Any Reputed Publisher |                     |
| 7.   | Agatha Christie        | 4.50 from Paddington      | Any Reputed Publisher |                     |
| 8.   | Dashiell Hammett       | The Maltese Falcon        | Any Reputed Publisher |                     |
| 9.   | Raymond Chandler       | The Long Goodbye          | Any Reputed Publisher |                     |

**REFERENCE BOOKS:**

| S.No | Authors                 | Title   | Publishers                 | Year Of Publication |
|------|-------------------------|---|----------------------------|---------------------|
| 1    | <u>Martin Priestman</u> | The Cambridge Companion to Crime Fiction (Cambridge Companions to Literature) | Cambridge university press | 2003                |

**Course Designers:**

- Ms.V.P.Gayathri  
Assistant Professor & Head,
- Mrs. M. Gayathri,  
Assistant Professor
- Dr. M. Manimozhi Vinesh  
Assistant Professor

**TRAVEL LITERATURE**

| Sem | Subject Code | Category      | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|---------------|---------|--------------|---------|--------------|-----------|--------|
| II  |              | Elective II B | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 3      |
|     |              |               | 90      | 6            | 90      | 6            |           |        |

**COURSE OBJECTIVE:**

- To make the students to learn the emerging trends in Literature and to make them understand travelogue writing.

### COURSE OUTCOMES:

On the successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K5) |
|-----------|--|-------------------------|
| CO1       | Have a broad knowledge of a travel book, understand the variety of writings and understand the cultural diversity reflected in them.   | K1                      |
| CO2       | Identify and describe the unique literary tendencies and how these genres contribute to understanding of life in general and societies | K3                      |
| CO3       | Analyze travel texts using different theoretical perspectives and historical methodologies.  | K2                      |
| CO4       | To develop the ability to evaluate and use effectively the relevant information and the capacity for analytical and critical thinking  | K6                      |

### Mapping with Programme Outcomes:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | S   | S   |
| CO2 | M   | S   | S   | M   | M   |
| CO3 | M   | M   | S   | S   | M   |
| CO4 | M   | M   | M   | S   | S   |

(S- Strong; M – Medium)

### UNIT-I Background Reading:

18 Hrs

History of Travel Writing  
Travel Writing and Ethnography  
Gender and Travel  
Globalization and Travel  
Travel and Religion  
Orientalism and Travel

### UNIT-II

18 Hrs

Laurence Sterne- *A Sentimental Journey Through France and Italy*

### UNIT-III

18 Hrs

Jack Kerouac - *On The Road*

### UNIT-IV

18 Hrs

Che Guevara - *The Motorcycle Diaries*

### UNIT-V

18 Hrs

Pico Iyer - *Video Night in Kathmandu*

**Total Hours: 90**

### TEXT BOOKS:

| S.No | Authors | Title | Publishers | Year | Of |
|------|---------|-------|------------|------|----|
|------|---------|-------|------------|------|----|

|    |                 |   | <b>Publication</b>    |
|----|-----------------|---|-----------------------|
| 1. | Laurence Sterne | <i>A Sentimental Journey Through France and Italy</i> | Any Reputed Publisher |
| 2. | Mark Twain-     | The Innocents Abroad                                  | Any Reputed Publisher |
| 3. | Jack Kerouac    | On The Road   | Any Reputed Publisher |
| 4. | Paul Theroux    | The Great Railway Bazar                               | Any Reputed Publisher |

**REFERENCE BOOKS:**

| <b>S.No</b> | <b>Authors</b>           | <b>Title</b>   | <b>Publishers</b> | <b>Year Of Publication</b> |
|-------------|--------------------------|--|-------------------|----------------------------|
| 1.          | Jennifer. Speake, editor | Literature of travel and exploration : an encyclopedia | Routledge         | 200                        |

**COURSE DESIGNERS:**

1. Ms.V.P.Gayathri  
Assistant Professor & Head,
2. Mrs. M. Gayathri,  
Assistant Professor
3. Dr. M. Manimozhi Vinesh  
Assistant Professor

**DEPARTMENT OF HISTORY- UG**

**B. A. [GENERAL] CBCS PATTERN**

**(Template for 2019-2020)**

| <b>S.NO</b>         | <b>PART</b> | <b>STUDY COMPONENTS</b> | <b>INS. HRS./WEEK</b> | <b>CREDIT</b> | <b>TITLE OF THE PAPER</b> | <b>CIA</b> | <b>UNIV EXAM</b> | <b>TOTAL</b> |
|---------------------|-------------|-------------------------|-----------------------|---------------|---------------------------|------------|------------------|--------------|
|                     |             | <b>COURSE TITLE</b>     |                       |               |                           |            |                  |              |
| <b>SEMESTER – I</b> |             |                         |                       |               |                           |            |                  |              |
| 1                   | I           | Language –I             | 6                     | 4             | Tamil –I /other language  | 25         | 75               | 100          |
| 2                   | II          | English –I              | 6                     | 4             | English -I                | 25         | 75               | 100          |

|                      |     |                        |           |           |   |            |            |            |
|----------------------|-----|------------------------|-----------|-----------|---|------------|------------|------------|
| 3                    | III | Core paper -I          | 5         | 4         | History of India upto 1000 A.D.                                   | 25         | 75         | 100        |
| 4                    | III | Core paper -II         | 5         | 4         | History of India Early Medieval period From 1000 A.D To 1526 A.D. | 25         | 75         | 100        |
| 5                    | III | Allied Paper -I        | 6         | 5         | Tourism I   | 25         | 75         | 100        |
| 6                    | IV  | EVS                    | 2         | 2         | EVS   | 25         | 75         | 100        |
|                      |     |                        | <b>30</b> | <b>23</b> |   | <b>150</b> | <b>450</b> | <b>600</b> |
| <b>SEMESTER -II</b>  |     |                        |           |           |   |            |            |            |
| 1                    | I   | Language -II           | 6         | 4         | Tamil -II /other language   | 25         | 75         | 100        |
| 2                    | II  | English -II            | 6         | 4         | English -II   | 25         | 75         | 100        |
| 3                    | III | Core paper -III        | 4         | 4         | History of India Later Medieval India From 1526 A.D To 1707 A.D.  | 25         | 75         | 100        |
| 4                    | III | Core paper -IV         | 4         | 4         | History of India from 1707 A.D to 1858 A.D.                       | 25         | 75         | 100        |
| 5                    | III | Allied Paper -II       | 6         | 5         | Tourism II  | 25         | 75         | 100        |
| 6                    | IV  | Value Education        | 2         | 2         | Value Education   | -          | 50         | 50         |
| 7                    | IV  | Soft Skill             | 2         | 1         | Soft Skill  | -          | 50         | 50         |
|                      |     |                        | <b>30</b> | <b>24</b> |   | <b>125</b> | <b>475</b> | <b>600</b> |
| <b>SEMESTER III</b>  |     |                        |           |           |   |            |            |            |
| 1                    | I   | Language -III          | 6         | 4         | Tamil -III/ other language  | 25         | 75         | 100        |
| 2                    | II  | English -III           | 6         | 4         | English-III   | 25         | 75         | 100        |
| 3                    | III | Core paper -V          | 4         | 4         | History of India from 1858 A.D to 1947 A.D                        | 25         | 75         | 100        |
| 4                    | III | Core paper -VI         | 4         | 4         | History of Tamilnadu upto 1565 A.D                                | 25         | 75         | 100        |
| 5                    | III | Allied Paper - III     | 6         | 5         | Indian Economic Development-I                                     | 25         | 75         | 100        |
| 6                    | IV  | Skill Based Subject -I | 2         | 2         | An Introduction to Museology & Archaeology                        | -          | 50         | 50         |
| 7                    | IV  | Non Major -I           | 2         | 2         | Women Studies   | -          | 50         | 50         |
|                      |     |                        | <b>30</b> | <b>25</b> |   | <b>125</b> | <b>475</b> | <b>600</b> |
| <b>SEMESTER - IV</b> |     |                        |           |           |   |            |            |            |
| 1                    | III | Language -IV           | 6         | 4         | Tamil-IV/other language   | 25         | 75         | 100        |



|  |     |                          |           |           |   |            |            |            |
|--|-----|--------------------------|-----------|-----------|---|------------|------------|------------|
| 2  | III | English –IV              | 6         | 4         | English-IV  | 25         | 75         | 100        |
| 3  | III | Core paper – VII         | 4         | 4         | History of Tamil nadu from 1565 A.D to 1947 A.D         | 25         | 75         | 100        |
| 4  | III | Core paper – VIII        | 4         | 4         | India and her Neighbours from 1900 A.D. to 2005 A.D.    | 25         | 75         | 100        |
| 5  | III | Allied Paper – IV        | 6         | 5         | Indian Economic Development-II                          | 25         | 75         | 100        |
| 6  | IV  | Skill Based Subject –II  | 2         | 2         | Human Rights Education                                  | -          | 50         | 50         |
| 7  | IV  | Non Major –II            | 2         | 2         | Competitive Examination                                 | -          | 50         | 50         |
|  |     |                          | <b>30</b> | <b>25</b> |   | <b>125</b> | <b>475</b> | <b>600</b> |
| Internship (optional) 1-3 credits IV Semester vacation Month of May<br><b>SEMESTER – V</b> |     |                          |           |           |   |            |            |            |
| 1  | III | Core paper – IX          | 6         | 4         | History of Europe 1789A.D. to 1919 A.D.                 | 25         | 75         | 100        |
| 2  | III | Core paper – X           | 6         | 4         | History of ancient world civilization                   | 25         | 75         | 100        |
| 3  | III | Core paper –XI           | 6         | 4         | History of Far East from 1900A.D to 2005A.D.            | 25         | 75         | 100        |
| 4  | III | Elective –I              | 5         | 3         | Constitutional history of India 1858 A.D to 2005 A.D    | 25         | 75         | 100        |
| 5  | III | Elective -II             | 4         | 3         | History of Contemporary Tamilnadu 1947 A.D to 2005 A.D. | 25         | 75         | 100        |
| 6  | IV  | Skill Based Subject –III | 3         | 2         | History of Vellore                                      | -          | 50         | 50         |
|  |     |                          | <b>30</b> | <b>20</b> |   | <b>125</b> | <b>425</b> | <b>550</b> |
| <b>SEMESTER – VI</b>   |     |                          |           |           |   |            |            |            |
| 1  | III | Core paper – XII         | 6         | 4         | History of Europe from 1919 A.D.to 2005A.D.             | 25         | 75         | 100        |
| 2  | III | Core paper – XIII        | 6         | 4         | History of world from 1945A.D. to 2005A.D.              | 25         | 75         | 100        |
| 3  | III | Core paper – XIV         | 6         | 4         | History of U.S.A. from 1932 A.D. to 2005 A.D            | 25         | 75         | 100        |
| 5  | III | Elective –III            | 5         | 3         | History of Science and Technology from 1900 A.D to      | 25         | 75         | 100        |

|   |    |                      |            |            |   |            |            |             |
|---|----|----------------------|------------|------------|---|------------|------------|-------------|
|   |    |                      |            |            | 2005 A.D.   |            |            |             |
| 6 | IV | Elective –IV         | 4          | 3          | Principles of Public Administration                   | 25         | 75         | 100         |
|   |    | Skill Based –IV      | 3          | 2          | Intellectuals of Tamilnadu From 1700 A.D. to 2005 A.D | -          | 50         | 50          |
| 7 |    | Extension Activities |            | 3          | Extension Activities                                  |            | 100        | 100         |
|   |    |                      | <b>30</b>  | <b>23</b>  |   | <b>125</b> | <b>525</b> | <b>650</b>  |
|   |    | <b>TOTAL</b>         | <b>180</b> | <b>140</b> |   |            |            | <b>3600</b> |

Mini Project (optional) 1-3 credits to be submitted in March.

### **B. A. [GENERAL] CBCS PATTERN**

**((Template for 2018-2019))**

| <b>Part</b> | <b>Subject</b> | <b>Papers</b> | <b>Hours</b> | <b>Credit</b> | <b>Total credit</b> | <b>Marks</b> | <b>Total Marks</b> |
|-------------|----------------|---------------|--------------|---------------|---------------------|--------------|--------------------|
| I           | Languages      | 4             | 24           | 4             | 16                  | 100          | 400                |
| II          | English        | 4             | 24           | 4             | 16                  | 100          | 400                |
| III         | Allied         | 4             | 24           | 5             | 20                  | 100          | 400                |
|             | Core           | 14            | 70           | 4             | 56                  | 100          | 1400               |
|             | Electives      | 4             | 18           | 3             | 12                  | 100          | 400                |
| IV          | EVS            | 1             | 2            | 2             | 2                   | 100          | 100                |
|             | Soft Skill     | 1             | 2            | 1             | 1                   | 50           | 50                 |
|             | Value Edn      | 1             | 2            | 2             | 2                   | 50           | 50                 |
|             | Non-maj        | 2             | 4            | 2             | 4                   | 50           | 100                |
|             | Skill-Based    | 4             | 10           | 2             | 8                   | 50           | 200                |
|             |                |               |              |               |                     |              |                    |
| V           | Extention      | 1             |              | 3             | 3                   | 100          | 100                |
|             |                | 40            | 180          |               | 140                 |              | 3600               |

❖ Internship (optional) 1-3 credits IV Semester vacation Month of May.

❖ Mini Project (optional) 1-3 credits to be submitted in March.

### **. PROGRAMME EDUCATIONAL OBJECTIVES**

**PEO -1** The students obtain wider knowledge of facts and figures of the past and make the learner assimilate the essence of that through multidisciplinary approach.

**PEO – 2** It takes the learners into the intellectual forum through the study of history. It inculcates a sense of nationalism to enable the student community to face the onslaught of communalism and casteism

## PROGRAMME OUTCOMES

**P01:** Analyze the relationship between the past and the present is lively presented in the history.

**P02:** Understand the present existing, political, social, economic, religious, culture and tradition conditions of the people.

**P03:** Students will be able to demonstrate broad knowledge of historical events and periods and their significance.

**P04:** Students can write Competitive Exams like TNPSC, UPSC and other departmental Exams.

**P05:** Develop practical skills helpful in the study and understanding of historical events. Draw historical maps, charts, diagrams etc.

**P06:** It enhances Employment opportunities in Museums, Archives of India, Archeology, and Tourism Department.

## HISTORY OF INDIA UPTO 1000 A.D

| Semester | Subject code | Category | Lecture |              | Theory  |              | Practical | Credit |
|----------|--------------|----------|---------|--------------|---------|--------------|-----------|--------|
| I        |              | Core - 1 | Week Hr | Total Hr/sem | Week Hr | Total Hr/sem | -         | 4      |
|          |              |          | 5       | 75           | 5       | 75           |           |        |

### COURSE OBJECTIVES:

- To enable the students to understand the Pre – History & Geographical factors of Ancient India.
- To make the students to understand the political, social, economic and cultural heritage of India.

### COURSE OUTCOMES:

On the successful Completion of the course, students will be able to

| CO Number  | Co Statement  | Knowledge Level |
|------------|---|-----------------|
| <b>CO1</b> | Students can identify the Geographical Divisions of India, the sources of Paleolithic, Mesolithic and Neolithic settlement. | K1,K2           |
| <b>CO2</b> | Know Indus valley Civilization, Political, Social and Economic conditions of Early and Later Vedic period.                  | K1,K2,K3,       |
| <b>CO3</b> | know the life of Lord Buddha and Mahavira, their teachings and spread of Buddhism, To understand Foreign                    | K1,K2,K3        |

|            |   |          |
|------------|---|----------|
|            | Persian Invasion.   |          |
| <b>CO4</b> | Understand the establishment of Mauryan Empire, Asoka's Dharma.         | K1,K2,K3 |
| <b>CO5</b> | Understand the establishment of Gupta Empire and Arab Conquest of Sind. | K1,K2    |

**(Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze)**

#### **MAPPING WITH PROGRAM OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | M          |

**(S –Strong M – Medium L –low)**

#### **UNIT –I**

**12 Hrs**

Pre History & Proto History : Geographical Factors - The Himalayas - The Gangetic plains-Deccan plateau- Western Ghats- Eastern Ghats - Eastern Coastal plain-Western Coastal plain- Sources Archaeological sources – Epigraphy – Numismatics- Monuments-Literary Sources - Indigenous Secular and non Secular - Foreign accounts (Megasthenes - Fa-Hien- Hiuen -Tsang -Alberuni- Ibn-battuta) - Pre-History - Proto - History-Paleolithic Age- Megalithic Age- Neolithic Age and Chalcolithic Age

#### **UNIT-II**

**18 Hrs**

Indus Valley Civilization : Origin-- Harappa and Mohenjo-Daro -Town Planning-Great Bath- Granaries – Socio life - Economic life - Religion - Art - Causes for the decline of Indus Valley Civilization - Vedic Civilization - Early Vedic - Political life - Social life - Position of Women - Economic Condition - Religion - Later Vedic Period - Origin - Political Life - Social life - Varna system - Stages of life - Economic life - - Guilds(shreni) - Religion - Changes in Varna System- Vedic Literature..

#### **UNIT-III**

**12 Hrs**

Jainism : Tirthankaras - Mahavira's and his Teachings (Tri Ratnas - Theory of Karma and Rebirth- Nirvanas-Five vows) - Dhigambaras - Swethambaras - Decline of Jainism- Buddhism: Gowthama Buddha - Teachings (Four Great Truths- Eight Fold Path - Ahimsa) - Downfall of Buddhism – Mahajanapadas - Alexander - Macedonian Invasion - Purushottama (Porus) - Battle of Hydaspes - Causes and Effects of the invasion.

**UNIT-IV****18 Hrs**

Mauryan Empire - Arthashastra - Chandra Gupta Maurya - Bindusara - Ashoka, Kalinga War, Concept of Dhamma, Rock Edicts, Pillar Edicts, Cave Inscriptions - Mauryan Administration - Socio and Economic life - Art and Architectures and literature - Downfall of the Mauryan Empire - Sathavahanas - Sakas - Kushan Empire - Kanishka's Conquest, Buddhist Council, School of Art - Gandhara, Mathura, Amaravathi.

**UNIT -V****15 Hrs**

Guptas - Samudra Gupta - Chandra Gupta-II - Fahien- Golden Age of Guptas - Administration- Socio - Economic - Education- Taxila University - Nalandha University- Literature - Science - Astrology, Arithmetic, Astronomy, Ayurvedha - Religion - Art and Architecture - Vakatakas - Harshavardhana's Conquest - Hiuen-T-sang - Rashtrakutas - Chalukyas - Arab Conquest of Sind and its effects.

**MAPS**

1. Geographical Features
2. Sites of Indus Valley Civilization
3. Alexander's Invasion-Route
4. Asoka's Empire
5. Kanishka's Empire
6. Harsha's Empire
7. Samudra Gupta's Empire

**Distribution of Marks: Theory – 90%; Map- 10%**

**TEACHING METHODOLOGY**

- Class Room Teaching
- Assignments
- Discussions
- Home test
- PPT Presentations

**TEXT AND REFERENCE BOOKS**

| S.no | Authors                    | Title  | Publishers                          | year  |
|------|----------------------------|--|-------------------------------------|-------|
| 3    | T.S.Ramalingam             | History of Ancient India                       | T.S.R. Publications, Madurai        | 1994. |
| 1    | S.P. Sharma                | History of Ancient India                       | Mohit Publications, New Delhi       | 1996. |
| 2    | Atlantic Research Division | Ancient History of India upto 10 <sup>th</sup> | Atlantic Publisher and Distribution | 2013. |

|  |  |              |             |  |
|--|--|--------------|-------------|--|
|  |  | Century A.D. | Pvt., Ltd., |  |
|--|--|--------------|-------------|--|

## WEB SOURCE

[www.historydiscussion.net/.../sources](http://www.historydiscussion.net/.../sources)

[knowledgemerger.com/sources.edu/indian/indias/asp](http://knowledgemerger.com/sources.edu/indian/indias/asp)

<https://www.ancient.eu/indus-valley-civilization>

<https://en.wikipedia.org/wiki/Buddhism>

[www.newworldencyclopedia.org/entry/maurya-empire](http://www.newworldencyclopedia.org/entry/maurya-empire)

<https://en.wikipedia.org/wiki/gupta.Empire>

## SYLLABUS DESIGNERS:

1.Lt. Dr. A. Amirthavalli, Head And Associate Professor Of History

2. Mrs. S. Jayanthi, Assistant Professor Of History

## HISTORY OF INDIA EARLY MEDIEVAL PERIOD FROM 1000 A.D TO 1526 A.D

| Semester | Subject code | Category  | Lecture |              | Theory  |              | Practical | Credit |
|----------|--------------|-----------|---------|--------------|---------|--------------|-----------|--------|
| I        |              | Core – II | Week Hr | Total Hr/sem | Week Hr | Total Hr/sem | -         | 4      |
|          |              |           | 5       | 75           | 5       | 75           |           |        |

## COURSE OBJECTIVES:

- Outline the development of political institution and relationships amongst Sultanate rulers
- Understand strategies of military control and resource mobilization
- To make the student to know about the establishment of Vijayanagar and Bahmani Kingdoms.
- To enable the students to understand the growth and importance of Bhakthi Cult.

## COURSE OUTCOMES

On the successful Completion of the course, students will be able to

| CO Number | Co Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Enrich the knowledge of the Turk invasion of India. | K1,K2           |

|            |   |          |
|------------|---|----------|
| <b>CO2</b> | Know Slave Dynasty and Khilji Dynasty                                   | K1,K2    |
| <b>CO3</b> | Know Sayyid Dynasty, Lodi Dynasty and the down fall of Delhi sultanate. | K1,K2    |
| <b>CO4</b> | know the establishment of Bahmani Kingdom and Vijayanagar Empire.       | K1,K2    |
| <b>CO5</b> | Understand the Bhakthi Movement and its effects.                        | K1,K2,K3 |

***(Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; k4 – Analyze***

#### **MAPPING WITH PROGRAM OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | M          |

***(S –Strong M – Medium L - Low )***

#### **UNIT-I**

**15 Hrs**

Early Turk Invasions of India - Political condition of India on the eve of Mahmud Ghazni's Invasion, Mahmud Ghazni's Expeditions - Muhammad Ghoris Invasion - First Battle of Tarain ,Second Battle of Tarain.

#### **UNIT- II**

**15 Hrs**

Slave Dynasty: Qutb ud din Aibak – Shams- ud-din Iltumish, Sultana-Razia Begum - Ghiyas ud Din Balban - The Forty - Divine Rights theory of Kingship - Khilji Dynasty – Jalal-ud-din-khilji - Ala-ud-din-khilji's, North Indian Expedition, Malikafurs South Indian Expedition, Market regulation - Tughluq Dynasty: Ghiyas-ud-din Tughluq - Muhammad-bin-Tughluq - Firoz shah Tughluq and Reforms - Timur Invasion of India.

#### **UNIT-III**

**15 Hrs**

Sayyid Dynasty: Khizr Khan, Mubarak Shah, Muhammad Shah and Alam Shah- Lodi Dynasty :Bahlol Lodi - Sikandar Shah Lodi - Ibrahim Lodi, - Disintegration of Delhi Sultanate –Delhi Sultanate’s Administrative system –Social and Economic condition - Art & Architecture.

#### **UNIT- IV**

**15 Hrs**

Bahmani Kingdom - Formation of Bahmani Kingdom - Aladd-din Hashan Bahman Shah - Muhammad Shah I - Muhammad Shah II - Feroz Shah Bahmani - Ahmad Shah - Muhammad Shah III - Muhammad Gawan - Decline of Bahmani Kingdom - Vijayanagar Empire - Harihara-I - Bukka-I - Krishna Deva Raya - Battle of Talaikota - Administration - Art & Architecture- Literature- Decline of the Vijayanagar Empire

#### **UNIT-V**

**15 Hrs**

Bhakthi Movement : Meaning, Origin, Causes - Bhakthi Movement in South (Adhi Sankara, Andal, Karaikkal Ammaiyar, Ramanuja, Vallabhacharya, Ramanandhar, Mirabai, Tulsidas, Kabir, Guru nanak, Chaitanya, Namadeva) - Effects of Bhakthi Movement.

#### **MAPS**

1. Alauddin khilji’s Empire
2. Malik kafur’s South Indian Expedition
3. Mohammed bin Tughluq’s Empire
4. Bahmini Kingdom
5. Vijayanagar Empire.

**Distribution of Marks: Theory – 90%; Map- 10%**

#### **Teaching Methodology**

- Class Room Teaching
- Assignments
- Discussions
- Home test
- PPT Presentations

#### **TEXT AND REFERENCE BOOKS**

| <b>S.no</b> | <b>Authors</b>             | <b>Title</b>  | <b>Publishers</b>                 | <b>year</b> |
|-------------|----------------------------|---|-----------------------------------|-------------|
| 1           | Atlantic Research Division | Medieval India from 8 <sup>th</sup> to 18 <sup>th</sup> century A.D | Atlantic Publisher New Delhi.     | 2013.       |
| 2           | V.D. Mahajan               | History of Medieval India   | S. Chand and Com. Ltd.            | 2012.       |
| 3           | Sathish Candra             | History of Medieval India   | Orient Blackswan Pvt. Ltd.        | 2014.       |
| 4           | R.C. Majumdar<br>H.C. Roy  | An Advanced History of India,                                       | Mac Millan India Ltd., New Delhi. | 2004.       |



|  |                     |  |  |  |
|--|---------------------|--|--|--|
|  | Chaudri & K. Datta. |  |  |  |
|--|---------------------|--|--|--|

#### WEB SOURCE

[https://en.wikipedia.org/wiki/Delhi Sultanate](https://en.wikipedia.org/wiki/Delhi_Sultanate)

[https://en.wikipedia.org/wiki/sutanate-sulu](https://en.wikipedia.org/wiki/Sultanate_of_Sulu)

#### SYLLABUS DESIGNERS:

1.Lt. Dr. A. Amirthavalli, Head And Associate Professor Of History

2. Mrs. S. Jayanthi, Assistant Professor in History

### TOURISM – I

| Semester | Subject code | Category  | Lecture |              | Theory  |              | Practical | Credit |
|----------|--------------|-----------|---------|--------------|---------|--------------|-----------|--------|
| I        |              | Core – II | Week Hr | Total Hr/sem | Week Hr | Total Hr/sem | -         | 5      |
|          |              |           | 6       | 75           | 6       | 75           |           |        |

#### COURSE OBJECTIVES:

- Students can understand Definition, Evolution and Development of Tourism.
- Students can understand the constituents of tourism industry, impact of tourism, travel agent and tour operator.

#### COURSE OUTCOME

On the successful Completion of the course, students will be able to

| CO Number  | Co Statement   | Knowledge Level |
|------------|--|-----------------|
| <b>CO1</b> | Know the Definition and meaning of tourism                             | K1,K2           |
| <b>CO2</b> | Get Motivation to travel   | K1,K2           |
| <b>CO3</b> | Acquire knowledge of constituents of tourism                           | K1,K2           |
| <b>CO4</b> | Understand the economic, political and environmental impact of tourism | K1,K2,          |
| <b>CO5</b> | .Acquire knowledge of the functions of Travel agency                   | K1,K2           |

**UNIT I**

**15 HRS**

Introduction to Tourism- Brief historical evolution & development -Definition of Tourism and its terms- Tour, Tourist, Visitor & Excursionist -The 5 A's of tourism: - Attraction, Accessibility, Accommodation , Amenities and Affordability.

## **UNIT II**

**15 HRS**

Types & forms of tourism- Motivation to travel - Types: Domestic, International- Inbound and Outbound -Forms: - Leisure, Business, Social, Cultural, Religious, Nature, cuisine, Family, Sports, Political, Health, Senior citizen. MICE(Meeting Incentives Conferences Exhibitions) Medical, Adventure -Alternative forms of tourism: Eco- tourism, Agro Rural Tourism, Special Interest Tourism

## **UNIT III**

**15 HRS**

Constituents of tourism industry- Primary Constituents: Accommodation, Food, Transport, Intermediaries, Govt. Organizations - Secondary Constituents : Shops and Emporiums-Handicrafts and Souvenirs, Local Transport, Communications Services, Publishing and Advertising Agencies, Entertainment, Touts and Brokers .

## **UNIT IV**

**15 HRS**

The Impact of Tourism- Economic impact: employment generation, foreign exchange earnings & infrastructure development - Social & Political Impact - Environmental Impact

## **UNIT V**

**15 HRS**

The Travel Agent and Tour operator- Meaning & definition of Travel Agent and Tour operator - Functions of Travel Agency -Online Travel Agency -Types of tour operators, inbound, outbound, domestic - Tour packaging: definition, components of a tour package, types of package tours - Setting up a travel agency

## **METHODOLOGY**

- Class Room Teaching
- Assignments
- Discussions
- Home test
- PPT Presentations

## **TEXT AND REFERENCE BOOKS**

| <b>S.no</b> | <b>Authors</b>    | <b>Title</b>                       | <b>Publishers</b>            | <b>year</b> |
|-------------|-------------------|------------------------------------|------------------------------|-------------|
| 1           | Barkal and Mclik, | Tourism –Past, Present and Future, | Heinemann Publishers, London | 1995        |

|   |                 |  |  |       |
|---|-----------------|--|--|-------|
| 2 | Kaul R. M.      | Dynamics of Tourism –A Triology, Vol I,        | Sterling, New Delhi.                                 | 1997. |
| 3 | Seth, Pran Nath | Successful Tourism Practices, Vol I            | Sterling, New Delhi.                                 | 1997. |
| 4 | Howell David    | An Introduction to Travel and Tourism Industry | Delmar Cengage Learning; 2nd Revised edition, London | 1993  |
|   | Gee Chuck Y     | The Travel Industry,                           | John Wiley & Sons, New York                          | 1993  |

### WEB SOURCE

<https://www.cultura.org/en/public.administration>

[https://www.peruperuperu.com/types\\_of\\_tour.htm](https://www.peruperuperu.com/types_of_tour.htm)

[https://en.wikipedia.org/wiki/Travel\\_visa](https://en.wikipedia.org/wiki/Travel_visa)

### SYLLABUS DESIGNERS:

1.Lt. Dr. A. Amirthavalli, Head And Associate Professor Of History

### HISTORY OF LATER MEDIEVAL INDIA FROM 1526 A.D TO 1707 A.D.

| Semester | Subject code | Category   | Lecture |              | Theory  |              | Practical | Credit |
|----------|--------------|------------|---------|--------------|---------|--------------|-----------|--------|
| II       |              | Core – III | Week Hr | Total Hr/sem | Week Hr | Total Hr/sem | -         | 4      |
|          |              |            | 4       | 60           | 4       | 60           |           |        |

### COURSE OBJECTIVES:

- Students can acquire knowledge about Mughal rule and their administration, architecture, socio, economic conditions.
- The paper also gives knowledge of Sikhism to students.

### COURSE OUTCOMES

On the successful Completion of the course, students will be able to

| <b>CO Number</b> | <b>Co Statement</b>   | <b>Knowledge Level</b> |
|------------------|---|------------------------|
| <b>CO1</b>       | Students can gain Knowledge of Babar invasion and the Foundation of Mughal Empire       | K1,K2                  |
| <b>CO2</b>       | Students can understand of Afghan Interregnum and Administration of Sher Shah           | K1,K2                  |
| <b>CO3</b>       | Consolidation of Mughal Empire under Akbar.   | K1,K2                  |
| <b>CO4</b>       | India under Jahangir, Nur Jahan, Shahjahan, Aurangzeb and Downfall of the Mughal Empire | K1,K2                  |
| <b>CO5</b>       | The Rise of Marathas and The rise of the Sikism.  | K1,K2                  |

***(Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; k4 – Analyze)***

#### **MAPPING WITH PROGRAM OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | M          |

***(S –Strong M – Medium L – Low)***

#### **UNIT- I**

**10 Hrs**

Source of Mughal Empire - Political Condition of India on the Eve of Babar's Invasion - Babar, Military conquest, First Battle of Panipet, Kanwah, Chanderi, Agra, Babar Nama – Humayun, Battle of Chausa, Kanauj.

#### **Unit-II**

**10 Hrs**

Afghan Interregnum - Sher Shah Sur - Conquests - Central - Provincial Administration – Military, Village, Land Revenue System, Judicial, Police system, Currency Reforms, Public reforms - Causes for the Decline of Sur Dynasty.

#### **Unit-III**

**12 Hrs**

Akbar, the Great: Conquests - Fall of Bairam Khan - Deccan Policy – Rajput Policy - Akbar's Religious Views Din-i-Ilahi - Administration - Mansabdari System.

#### **Unit-IV**

**13 Hrs**

Jahangir - Accession to Throne, Twelve Ordinance, Wars and Conquests - Influence of Nur Jahan – Shahjahan - Extension of the Empire – Art and Architecture - Aurangzeb – The Eastern Front – North-West Front - Deccan Campaign - Religious policy of Aurangzeb - Downfall of the Mughal Empire - Mughals Administration - Art and Architecture.

#### **Unit-V**

**15 Hrs**

The Rise of Marathas – Shivaji's conquest –Maratha war – Administration, Chauth-Sardeshmukhi - The rise of the Sikhs - Guru Nanak– Guru Angad Dev- Guru Amardas – Guru Ram dass- Guru Arjan Dev- Guru Hargobind – Guru har Krishan- Guru Tegh bahadur-Khalsa period- Guru Govind Singh-Guru Granth sahib.

#### **MAPS**

1. Mughual Empire under Babur
2. Sur Empire under Sher Shah
3. Mughual Empire under Akbar
4. Mughual Empire under Aurangazeb
5. Marathas Empire under Shivaji

**Distribution of Marks: Theory – 90%; Map- 10%**

#### **Teaching Methodology**

- Class Room Teaching
- Assignments
- Discussions
- Home test
- PPT Presentations

#### **TEXT AND REFERENCE BOOKS**

| <b>S.no</b> | <b>Authors</b>    | <b>Title</b>   | <b>Publishers</b>                 | <b>year</b> |
|-------------|-------------------|--|-----------------------------------|-------------|
| 1           | Satish Chandra    | History of Medieval India (800 – 1700)               | Orient blackswan private limited. | 2009.       |
| 2           | SC. Roy choudhary | History of Medieval India from 1000 A.D. to 1707A.D. | Surjeet Publication.              | 2007.       |

|   |             |  |   |       |
|---|-------------|--|---|-------|
| 3 | J.L. Mehta  | Advanced Study in the History of Medieval India. | Sterling Publishers Pvt. Ltd., New Delhi. | 1999. |
| 4 | L.P. Sharma | History of Medieval India (1000-1740 AD),        | Konark Publishers Pvt. Ltd., SNew Delhi.  | 1997. |

#### Web source

<https://www.britanica.com/topic/mughal-dynasty>

[www.historydiscussion.net...mughal](http://www.historydiscussion.net...mughal)

<https://wikipedia.org/wiki/mughai.Empire>

#### SYLLABUS DESIGNERS:

1. Dr. G. Vijalakshmi, Assistant Professor Of History

2. Mrs . M. Vanitha, Assistant Professor Of History

#### HISTORY OF MODERN INDIA FROM 1707 TO 1858 A.D.

| Semester | Subject code | Category   | Lecture |              | Theory  |              | Practical | Credit |
|----------|--------------|------------|---------|--------------|---------|--------------|-----------|--------|
| II       |              | Core – III | Week Hr | Total Hr/sem | Week Hr | Total Hr/sem | -         | 4      |
|          |              |            | 4       | 60           | 4       | 60           |           |        |

#### COURSE OBJECTIVES:

- The students can gain the knowledge of European Settlements and the British Expansion in India.
- To gain knowledge about Constitutional Development and political changes in India.

#### COURSE OUTCOMES

On the successful Completion of the course, students will be to

| CO Number | Co Statement  | Knowledge Level |
|-----------|---|-----------------|
| CO1       | Acquires knowledge about the Advent of Europeans.       | K1, K2          |
| CO2       | Consolidation of East India Company in India.           | K1,K2           |
| CO3       | Analyze the administrations Governor Generals of India. | K1.K2           |
| CO4       | Students Will get Knowledge of Constitute               | K1,K4           |

|            |                                   |       |
|------------|-----------------------------------|-------|
|            | Development.                      |       |
| <b>CO5</b> | Transformation of Administration. | K1,K2 |

**(Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze)**

### **MAPPING WITH PROGRAM OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | S          |

**(S –Strong M – Medium L – Low)**

### **Unit – I**

**10 Hrs**

Advent of the Europeans to India - The Portuguese –( Vasco-Da -Gama - Francis –De-Almeida – Albuquerque) - The Dutch Masulipattnam, Nagapattinam - The Danes – Tranquebar - The English – East India Company, Bombay, Madras, Calcutta - The French, Pondicherry, Duplex, Colbert,.

### **UNIT –II**

**10 Hrs**

Anglo- French Conflict - Three Carnatic Wars - Black Hole Tragedy – Battle of Plassey – Mir Jafar – Mir Kasim – Battle of Buxar –Governor of Bengal -Robert Clive - Dual Government in Bengal from 1765 to 1772.

### **UNIT- III**

**15 Hrs**

Lord Warren Hastings – (The Rohilla War – Trial of Nandha Kumar – Begums of Outh – Regulating Act –First Maratha war –First Mysore War – Second Mysore war ) – Lord Cornwallis – (Third Mysore war – Reforms of Public Services – Judicial Reforms – Pernment Settlement of Bengal ) – Sir John Shore - Lord Wellesley – (Subsidiary Alliance – Fourth Mysore War – Second Maratha War – War with Holkar ) – Lord Hastings – (War with Nepal – Pindari war – Third Maratha war)– Lord Amhert – First Burmese War.

### **UNIT- IV**

**10 Hrs**

Later Mughals - Peshwas – Maratha Confederacy - Lord William Bentinck, Social Reforms - Auckland – Lord Ellenborough – Lord Harding – Raja Ranjith Sing.

### **UNIT –V**

**15 Hrs**

Lord Dalhousie – Second Burmese war – Doctrine of Lapse, Telegraphs, Railways, Public work Department, Postal system, Education Reforms, Woods Despatch - The Great Revolt - Causes

Political, Social, Economic, Military, Religious and Immediate Causes - Course- Result and Failure of the Revolt - Results.

### **MAPS**

1. European settlements in India
2. British India under Warren Hastings
3. British India under Wellesley
4. British India under Dalhousie
5. Places Connected with the Revolt of 1857

### **TEACHING METHODOLOGY**

1. Class Room Teaching
2. Assignments
3. Discussions
4. Home test
5. PPT Presentations

### **TEXT AND REFERENCE BOOKS**

| <b>S.no</b> | <b>Authors</b>         | <b>Title</b>   | <b>Publishers</b>                           | <b>year</b> |
|-------------|------------------------|--|---|-------------|
| 1           | Sujata Menon           | History of Modern India for Civil Service                      | G.K. Publication New Delhi Private Limited, | 2019        |
| 2           | Singh, Layola & Pandey | Constitution, Polity & Governance for civil services and state | Unique publishers (I) Pvt.(Ltd), New Delhi, | 2018        |
| 3           | B.L. Grover            | Modern Indian History (1707 to Modern Times)                   | S. Chand and Company Pvt. Ltd.              | 2015.       |
| 4           | Bipan Chandra          | History of Modern India,                                       | Orient Black Swan Pvt. Ltd,                 | 2014.       |

### **WEB SOURCE**

**[HTTPS:\\WWW.JAGRANJOSH.COM...History](https://www.jagranjosh.com...History)**

**[https:\\en.wikipedia.org\\wiki\\Governor-General of India](https://en.wikipedia.org/wiki/Governor-General_of_India)**

### **SYLLABUS DESIGNERS:**

1. Dr. G. Vijalakshmi, Assistant Professor Of History



## TOURISM II

| Semester | Subject code | Category    | Lecture |              | Theory  |              | Practical | Credit |
|----------|--------------|-------------|---------|--------------|---------|--------------|-----------|--------|
| II       |              | Allied - II | Week Hr | Total Hr/sem | Week Hr | Total Hr/sem | -         | 5      |
|          |              |             | 6       | 75           | 6       | 75           |           |        |

### COURSE OBJECTIVES:

- Students came to know the role and functions of Tourism organizations and Role of transportation in tourism.
- The Curriculum will help the students to analyse importance of the documentation , Itinerary planning , World and Indian Tourist Destinations and Guides

### COURSE OUTCOMES

On the successful Completion of the course, students will be able to

| CO Number  | Co Statement  | Knowledge Level |
|------------|---|-----------------|
| <b>CO1</b> | Acquire knowledge of the role and functions of tourism organization | K1, K2          |
| <b>CO2</b> | Understand the Importance of Transportation in Tourism              | K1,K2,k4        |
| <b>CO3</b> | Students know about passport, Visa and travel regulations           | K1,K2,K3,K4     |
| <b>CO4</b> | Understand the importance of planning for travel                    | K1,K2,K3,K4     |
| <b>CO5</b> | Familiarize the major tourist attractive places of the world        | K1, K2,K3,K4,   |

**(Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; k4 – Analyze)**

### MAPPING WITH PROGRAM OUTCOMES

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | S   | S   | S   | S   |
| <b>CO2</b> | S   | S   | S   | S   | S   |
| <b>CO3</b> | S   | S   | S   | S   | S   |
| <b>CO4</b> | S   | S   | S   | S   | S   |
| <b>CO5</b> | S   | S   | S   | S   | S   |

**(S –Strong M – Medium L – Low)**

### UNIT I

**15 Hrs**

Role & functions of tourism organizations- Govt. organisation: - MTDC, ITDC, IndiaTourism, TFCI - Domestic Organisation: - TAAI, FHRAI - International Organisation: -UNWTO, IATA

**UNIT II****10 Hrs**

Role of Transportation in tourism- Rail Transportation - Road Transportation - Air Transportation - Water Transportation

**UNIT III****15 Hrs**

Documentation- Passport: Definition, types, requirements for Passport - Visa: - Definition, types of visa, requirements for visa - Other travel regulations – health regulations, insurance, permits etc.

**UNIT IV****15 Hrs**

Itinerary Planning- Meaning and Basics of Itinerary planning- Steps in Itinerary planning , Special interest Itineraries- Planning Itineraries (Domestic and International) - Week end, One week, Two weeks and more

**UNIT V****20 Hrs**

World & Indian Tourist Destinations and Guides- World division according to IATA - IATA – I, IATA – II, IATA – III & Continents- Present status of tourism in the world- Major tourist attractions in the world/ Continents - Major tourist attractions in India-North, South, East, West - Role, functions and characteristics of Guides and Escorts- Guiding and Escorting a tour

**TEXT AND REFERENCE BOOKS**

| <b>Name of the Book</b>   | <b>Authors</b>    | <b>Publication</b> |
|---|-------------------|--------------------|
| Tourism -Past, Present and Future3. Seth Pran Nath, New Delhi, 1997 | Burkart and Melik | London, 1995       |
| Dynamics of Tourism – A Triology, Vol.I.                            | R.M. Kaul         | New Delhi, 1997    |
| Successful Tourism Practices, Vol.I.,                               | Seth Pran Nath,   | New Delhi, 1997    |

**TEACHING METHODOLOGY**

- Class Room Teaching
- Assignments
- Discussions
- Home test
- PPT Presentations
- Projects

**SYLLABUS DESIGNERS:**

1.Lt. Dr. A. Amirthavalli, Head And Associate Professor Of History.

| <b>S.no</b> | <b>Authors</b> | <b>Title</b> | <b>Publishers</b> | <b>year</b> |
|-------------|----------------|--------------|-------------------|-------------|
|-------------|----------------|--------------|-------------------|-------------|

|    |  |   |                     |                 |
|----|--|---|---------------------|-----------------|
| 1  | Burkart and Melik  | Tourism -Past, Present and Future3. Seth Pran Nath, New Delhi, 1997 | Sterling,New Delhi. | London, 1995    |
| 2  | R.M. Kaul  | Dynamics of Tourism – A Triology, Vol.I.                            | Sterling,New Delhi. | New Delhi, 1997 |
| 3  | Seth Pran Nath,  | Successful Tourism Practices, Vol.I.,                               | Sterling,New Delhi. | New Delhi, 1997 |
| 4. | Prof C.R.Sharma  | Natioinal Instrute of Open Schooling - Tourism                      | MHRD. Noida         | April 2017      |
| 5. | <a href="#">Charles R. Goeldner,</a><br><br><a href="#">J.R. Brent Ritchie</a> | Tourism : Principles, Practices and Philosophies.                   | John Wiley & Sons   | Oct 2008        |

#### **WEB SOURCE**

<https://www.tourismchallenge.ca/rules-and-conduct>

<https://resources.envoyglobal.com>

[https://en.wikipedia.org/wiki/Travel\\_visa](https://en.wikipedia.org/wiki/Travel_visa)

[https://www.nios.ac.in/media/documents/tourism\\_337\\_courseE/Tourism\\_Book-01.pdf](https://www.nios.ac.in/media/documents/tourism_337_courseE/Tourism_Book-01.pdf)

<http://www.ignouhelp.in/ignou-ts-01-study-material/>

#### **DEPARTMENT OF HISTROY PG**

# MASTER OF HISTORY

(With effect from 2019 – 2020)

| S.NO           | Study Components |            | Hrs/week | Credit | Title of the Paper  | Max. Marks |     |       |
|----------------|------------------|------------|----------|--------|---|------------|-----|-------|
|                | Course Title     |            |          |        |   | C.A        | Sem | Total |
| SEMESTER - I   |                  |            |          |        |   |            |     |       |
| 1              | Main             | Paper I    | 6        | 5      | History of India upto 1206 A.D.                                       | 25         | 75  | 100   |
| 2              | Main             | Paper II   | 6        | 5      | History of India from 1206 A.D to 1707 A.D                            | 25         | 75  | 100   |
| 3              | Main             | Paper III  | 6        | 5      | Social and Cultural History of Tamil Nadu from Sangam Age to 1565 A.D | 25         | 75  | 100   |
| 4              | Main             | Paper IV   | 6        | 4      | Intellectual History of the 19 <sup>th</sup> Century India            | 25         | 75  | 100   |
| 5              | Elective I       | Paper I    | 6        | 3      | Constitutional History of India from 1773 A.D to 1947 A.D             | 25         | 75  | 100   |
| Total          |                  |            | 30       | 22     |   | 125        | 375 | 500   |
| Optional       | Self study Paper |            |          | 2*     | Online Course   |            |     |       |
| SEMESTER - II  |                  |            |          |        |   |            |     |       |
| 6              | Main             | Paper V    | 6        | 5      | History of India from 1707 A.D to 1885 A.D                            | 25         | 75  | 100   |
| 7              | Main             | Paper VI   | 6        | 5      | History of India from 1885 A.D to 2001 A.D                            | 25         | 75  | 100   |
| 8              | Main             | Paper VII  | 6        | 5      | Social and Cultural History of Tamil Nadu from 1565 to 2000 A.D       | 25         | 75  | 100   |
| 9              | Main             | Paper VIII | 6        | 4      | Intellectual History of the 20 <sup>th</sup> Century India            | 25         | 75  | 100   |
| 10             | Elective II      | Paper II   | 4        | 3      | Republican Constitution   | 25         | 75  | 100   |
| 11             | Compulsory Paper |            | 2        | 2      | Human Rights  | 25         | 75  | 100   |
| Total          |                  |            | 30       | 24     |   | 150        | 450 | 600   |
| SEMESTER – III |                  |            |          |        |   |            |     |       |
| 12             | Main             | Paper      | 6        | 5      | History of Europe   | 25         | 75  | 100   |

|                      |                        |            |    |    |   |     |     |     |
|----------------------|------------------------|------------|----|----|---|-----|-----|-----|
|                      |                        | IX         |    |    | from 1453 A.D to 1789 A.D.  |     |     |     |
| 13                   | Main                   | Paper X    | 6  | 5  | Historiography  | 25  | 75  | 100 |
| 14                   | Main                   | Paper XI   | 6  | 5  | History of World Civilizations (Excluding India) Ancient Period           | 25  | 75  | 100 |
| 15                   | Main                   | Paper XII  | 6  | 4  | General Studies For Competitive Examination                               | 25  | 75  | 100 |
| 16                   | Elective III           | Paper III  | 6  | 3  | Tourism   | 25  | 75  | 100 |
| <b>Total</b>         |                        |            | 30 | 22 |   | 125 | 375 | 500 |
| Optional             | Self study Paper       |            |    | 2* | Online Course   |     |     |     |
| <b>SEMESTER - IV</b> |                        |            |    |    |   |     |     |     |
| 17                   | Main                   | Paper XIII | 6  | 5  | History of Europe from 1789 A.D to 2000 A.D.                              | 25  | 75  | 100 |
| 18                   | Main                   | Paper XIV  | 6  | 5  | Research Methodology in History   | 25  | 75  | 100 |
| 19                   | Main                   | Paper XV   | 6  | 4  | History of World Civilization (Excluding India)Medieval and Modern Period | 25  | 75  | 100 |
| 20                   | Elective IV            | Paper IV   | 6  | 3  | History of USA from 1900 A.D. to 2000 A.D.                                | 25  | 75  | 100 |
| 21                   | Project with Viva Voce |            | 6  | 5  | -   | 25  | 75  | 500 |
| <b>Total</b>         |                        |            |    |    |   | 125 | 375 | 500 |

### CONSOLIDATED STATEMENT

| SUBJECT                | PAPERS | HOURS | CREDIT | TOTAL CREDITS | MARKS | TOTAL MARKS |
|------------------------|--------|-------|--------|---------------|-------|-------------|
| <b>MAIN</b>            | 15     | 90    | 4-5    | 71            | 100   | 1500        |
| <b>ELECTIVE</b>        | 4      | 22    | 3      | 12            | 100   | 400         |
| <b>COMPULSO<br/>RY</b> | 1      | 2     | 2      | 2             | 100   | 100         |

|                |    |     |   |    |     |      |
|----------------|----|-----|---|----|-----|------|
| <b>PROJECT</b> | 1  | 6   | 5 | 5  | 100 | 100  |
| <b>TOTAL</b>   | 21 | 120 |   | 90 |     | 2100 |

### HISTORY OF INDIA UPTO 1206 A.D.

| Sem | Subject code | Category | Lecture Hr / Sem | Theory | Practical     | Credit |
|-----|--------------|----------|------------------|--------|---------------|--------|
| 1   |              | Main     | 6 hr per week    | 90     | 6 hr per week | 5      |

#### COURSE OBJECTIVE

- To enable the students to understand the salient feature of Indus valley civilization.
- To make the students to understand the administration, art and architecture of Mauryas.

#### COURSE OUTCOMES

On the successful completion of the course the student will be able to ..

| CO Number   | CO Statement   | Knowledge Level (K1-K4) |
|-------------|--|-------------------------|
| <b>CO 1</b> | Understand the salient features of Indus valley civilization                       | <b>K2</b>               |
| <b>CO2</b>  | Evaluate the features of Buddhism and Jainism                                      | <b>K3</b>               |
| <b>CO 3</b> | Visualize the administration of Mauryas and the art and architecture of Mauryas    | <b>K3</b>               |
| <b>CO 4</b> | Identify the administration of Guptas and their contribution to Nalanda University | <b>K2</b>               |
| <b>CO 5</b> | Examine the Arab conquest of Sindu   | <b>K3</b>               |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 - Analyse

#### MAPPING WITH PROGRAMME OUTCOMES

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | M   | S   | S   | M   |
| <b>CO2</b> | S   | M   | S   | S   | M   | S   |
| <b>CO3</b> | M   | S   | S   | M   | M   | S   |
| <b>CO4</b> | S   | M   | M   | M   | S   | M   |
| <b>CO5</b> | S   | S   | M   | S   | S   | S   |

S- Strong;

M – Medium;

L- Low

#### UNIT – I Indus Valley Civilization

**18Hrs**

Physical Features of India – Unity in Diversity – Sources of Indian History – Indus Valley Civilization – Great both – Mother goddess.

## **UNIT – II The Vedic Age**

**18 Hrs**

The Vedic Age –Political, Social, Economic and Religious Condition of Aryans – Comparison of Indus Valley and Early Vedic Civilization –Contribution of Vedic Age to History of India.

## **UNIT – III Buddhism and Jainism**

**18 Hrs**

Life and Teachings of Mahavira – Effects of Jainism –Career and Teachings of Lord Buddha – Effects of Buddhism on the political, Social, Religious and Cultural History India – Growth and Decline of Buddhism.

## **UNIT – IV Mauryan**

**18 Hrs**

Rise of the Magadha Empire– Growth of Magadha Empire – Rise and Fall of Nanda dynasty – Alexander's Invasion – Effect of Alexander's Invasion- The Mauryan Dynasty – Sources of Mauryan Dynasty – Chandragupta Maurya – Administrative System Under the Mauryans – Ashoka – Decline of the Mauryan..

## **UNIT-V Golden age of Guptas**

**18 Hrs**

The Kushans – Kanishka – Golden age of Guptas-Political History-Administration –Art and Architecture- Decline of Guptas – Harsha Vardhana – Arab Invasion of Sind – Mohammed of Ghazni – Mohammed of Ghor.

### **TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Home test
- PPT Presentations.

### **TEXT BOOKS**

| <b>S.no</b> | <b>Authors</b>            | <b>Title</b>                                 | <b>Publishers</b>        | <b>Year Of Publication</b> |
|-------------|---------------------------|--|--------------------------|----------------------------|
| 1           | V.D.Mahajan               | History of India from beginning to 1526 A.D. | S.Chand and Company Ltd. | 1999                       |
| 2           | Dr.Kiran Chenra Chaudhuri | History of Ancient India                     | S.Chand and Company      | 1982                       |

|   |                    |  |                                   |      |
|---|--------------------|--|-----------------------------------|------|
|   |                    |  | Ltd.                              |      |
| 3 | Sathianathai<br>er | A Political and Cultural History of<br>India | S.Viswanat<br>han Pvt,<br>Ltd.    | 1980 |
| 4 | V.D.Mahajan        | Anciet India                                 | S.Chand<br>and<br>Company<br>Ltd. | 1998 |
| 5 | V.D.Mahajan        | History of Medieval India                    | S.Chand<br>and<br>Company<br>Ltd. | 2001 |
| 6 | S.Allen            | The Cambridge shorted History of<br>India    | H.H<br>Dodwell                    | 1969 |

## REFERENCE BOOKS

| S.no | Authors                        | Title  | Publishers   | Year Of<br>Publication |
|------|--------------------------------|--|--------------|------------------------|
| 1    | V.D.Mahajan                    | Ancient India  | S.Chand & Co | 1981                   |
| 2    | Dr.B.P.Saha &<br>Dr.K.S.Behra; | Ancient History of<br>India                            | Vikas        | 1994                   |
| 3    | S.C.<br>Raychoudhary           | History of Ancient<br>India Earlist times<br>to 320A.D | Surjeet      | 2006                   |

## WEB SOURCE:

[www.haranandpublications.com](http://www.haranandpublications.com)

## SYLLABUS DESIGNER :

1. Dr. A. Amirthavalli, Head and Associate Professor of History.
2. Dr. A. Zarina Begum, Assistant Professor of History.
3. Dr. P. Savithri, Assistant Professor of History.

## HISTORY OF INDIA FROM 1206 A.D. TO 1707A.D.

| Sem | Subject<br>code | Category | Lecture              |    | Theory               | Practical | Credit |
|-----|-----------------|----------|----------------------|----|----------------------|-----------|--------|
| 1   |                 | Main     | 6 hrs<br>per<br>week | 90 | 6 hrs<br>per<br>week | 90        | -<br>5 |

## COURSE OBJECTIVE



- To enable the students to understand the foundation of the Delhi Sultanate and the Sultanate Administration.
- To make the students to understand the condition of India under Mughal Empire.

### **COURSE OUTCOMES**

On the successful completion of the course the student will be able to ..

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| <b>CO1</b>       | Understand the foundation of the Delhi Sultanate and the Sultanate Administration. | <b>K2</b>                      |
| <b>CO2</b>       | Recognise the Socio, economic and religious conditions under Vijayanagar Empire    | <b>K3</b>                      |
| <b>CO3</b>       | - Identify the condition of India under the Mughal Empire.                         | <b>K2</b>                      |
| <b>CO4</b>       | - Explain the Administration and art and architecture of Mughals.                  | <b>K3</b>                      |
| <b>CO5</b>       | Explain the role of Maratha.   | <b>K2</b>                      |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyze

### **Mapping with Programme Outcomes**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | S          | S          | M          |
| <b>CO2</b> | S          | S          | M          | S          | S          | M          |
| <b>CO3</b> | M          | S          | M          | S          | M          | S          |
| <b>CO4</b> | S          | M          | S          | S          | M          | S          |
| <b>CO5</b> | S          | S          | M          | S          | M          | S          |

S- Strong;

M – Medium;

L –Low

### **UNIT –I Slave Dynasty**

**18 Hrs**

Slave Dynasty – Qutb – ud – din Aibak – Iltutmish – Razia begum – Behramshah – Nasir –ud – Din Mahmud – Balban – Mongol Invasions – Effect of Mongal Invasions – Khilji Dynasty – Alaudidn Khilji – Malik Kafur – Amir Kurso – Successors of Alauddin Khilji – Indian Expedition – Market Regulation.

### **UNIT –II House of Tughluqs**

**18 Hrs**

House of Tughluqs – Ghiyas ud din - Tughluq – Mohammed – Ferozshah - Muhammad- bin- Tughluq – Successors of Mohammed bin Tughluq - Timurs Invasion – Sayyids – khizr khan – Mubaraksha – Mohammed – bin – farid – Alauddin – Alamsha – Lodis – Behlol Lodi – Imrahimlodi.

### **UNIT- III Sultanate**

**18 Hrs**

Sultanate – Administration – Art – Architecture – Decline of Sultanate- Vijayanagar Empire - Krishna Deva Raya – Mughal- Babur- Humayun – Shershah- Administration - Akbbar – Din – Ilahi – Jahankir – Shahjahan – Aurangzeb`.

### **UNIT- IV Art and Architecture of Mughals**

**18 Hrs**

Art and Architecture of Mughals – Deccan Policy – Rajput Policy – Mughals Administration – Downfall of Mughals – Sikh Gurus – Life and Teachings of Guru Nanak – Guru Angad – Amar Dass and Ram Dass – Guru Arjun Dev – Guru Har Govind – Guru Tegh Bahadur – Guru Govind Singh.

### **UNIT- V Rise of Maratha**

**18 Hrs**

Rise of Maratha – Shivaji – Relation with Aurangzeb – Administration of Shivaji Mughal – Maratha Relation – Peshwas - Sambhaji Achievement – Decline of Marathas.

### **TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Home test
- PPT Presentations.

### **TEXT BOOKS**

| <b>S.no</b> | <b>Authors</b>        | <b>Title</b>  | <b>Publishers</b>     | <b>Year Of Publication</b> |
|-------------|-----------------------|---|-----------------------|----------------------------|
| 1           | S.C.RoyChoudhery      | History of Medieval India from 1000 A.D to 1707A.D. | Surject               | 1992                       |
| 2           | Anil Chandra Banerjee | New History of Medieval India                       | S.Chand & Company     | 1993                       |
| 3           | Sathish Chandra       | Medieval India(1526 – 1748)                         | Anand                 | 2010                       |
| 4           | V.D.Mahajan           | The Sulthanate of Delhi                             | S.Chand & Company Ltd | 1992                       |

|   |            |  |        |      |
|---|------------|--|--------|------|
| 5 | L.P.Sharma | History of Medieval India 1000 – 1740 A.D. | Konark | 1994 |
|---|------------|--|--------|------|

## REFERENCE BOOKS

| S.no | Authors                                       | Title  | Publishers          | Year Of Publication |
|------|---|--|---------------------|---------------------|
| 1    | J.L.Mehta                                     | Advanced study the History of medieval India | sterling            | 1992                |
| 2    | L.P.Sharma                                    | History of medieval India                    | konark              | 1997                |
| 3    | R.C.Majumdar<br>H.C.Roy chandhi<br>& K.Datta; | An Advanced History of India                 | Macmillan India Ltd | 2004                |

## WEB SOURCE:

[www.haranandpublications.com](http://www.haranandpublications.com)

## SYLLABUS DESIGNER :

1. Dr. A. Amirthavalli, Head and Associate Professor of History.
2. Dr. A. Zarina Begum, Assistant Professor of History.
3. Dr. P. Savithri, Assistant Professor of History

## SOCIAL AND CULTURAL HISTORY OF TAMIL NADU FROM SANGAM AGE TO 1565A.D.

| Sem | Subject code | Category | Lecture Hr/Sem      |    | Theory              |    | Practical | Credit |
|-----|--------------|----------|---------------------|----|---------------------|----|-----------|--------|
| 1   |              | Main     | 6<br>Hr per<br>week | 90 | 6 hr<br>per<br>week | 90 | -         | 5      |

## COURSE OBJECTIVE

- To enable the students to understand the Social, Economical Cultural condition of Sangam Age.
- To make the students to understand the importance of Pandiyan Empire.

## COURSE OUTCOMES

On the successful completion of the course the student will be able to ..

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | Understand the Social ,Economical Cultural condition of the Sangam Age. | K2                      |
| CO2       | Identify the contribution of Pallavas to Art and Architecture.          | K2                      |
| CO3       | Analyse the rise of Imperial Cholas                                     | K3                      |
| CO4       | Study the importance of Pandiyan Empire.                                | K3                      |
| CO5       | Known the significance of Vijayanagar rule.                             | K2                      |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyze

## MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | S   | S   | M   |
| CO2 | M   | S   | M   | S   | M   | S   |
| CO3 | S   | M   | M   | S   | S   | S   |
| CO4 | M   | S   | M   | S   | M   | M   |
| CO5 | S   | M   | S   | M   | S   | S   |

S- Strong; M-Medium; L-Low

### UNIT –I Sources

18 Hrs

Physical Features of Tamilaham – Sources – Sangam Age – Sangam Literature – Socio, Economics and Religious life.

### UNIT- II Pallavas of Kanchi

18 Hrs

Pallavas of Kanchi – Society, Economy, Art and Architecture Education Bhakthi Movement.

### UNIT –III First Pandiyan Empire

18 Hrs

First Pandiyan Empire – Society, Economy, Culture, Art and Architecture -Rise of Imperial Cholas – Society – Economy and Culture – Art and Architecture.

### UNIT –IV Second Pandiyan Empire

18 Hrs

Second Pandiyan Empire – Society, Economy and Culture –Art and Architecture.

### UNIT –V Muslim Invasion

18 Hrs

Muslim Invasion\_- Society, Economy and Cultural life of Madurai Sultans - Vijayanagar rule – Society -Economy – Culture, Art and Architecture.

**TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Home test
- PPT Presentations.

**TEXT BOOKS**

| <b>S.n<br/>o</b> | <b>Authors</b>                                    | <b>Title</b>   | <b>Publishers</b>        | <b>Year Of<br/>Publication</b> |
|------------------|---|--|--------------------------|--------------------------------|
| 1                | P.Subramanian                                     | Social History of the Tamils(1707 - -1947)           | D.K.Printworld(p)) Ltd.  | 1978                           |
| 2                | P.N. Chopra,<br>T.K.Ravindran &<br>N.Subrahmanian | History of South India                               | S.Chand &<br>Company Ltd | 1979                           |
| 3                | Chithra Madhavan                                  | History and Cultural of Tamil Nadu (1310 - 1885A.D)  | D.K.Printworld           | 2007                           |
| 4                | Burton Stein                                      | The New Cambridge History of India under Vijayanagar | Cambridge University     | 1937                           |

**REFERENCE BOOKS**

| <b>S.no</b> | <b>Authors</b>       | <b>Title</b>                                     | <b>Publishers</b>  | <b>Year Of<br/>Publication</b> |
|-------------|----------------------|--|--------------------|--------------------------------|
| 1           | K.A. Nilakantasastri | A History of South India                         | Oxford University  | 1975                           |
| 2           | T.V. Mahalingam      | Administration and Social life under Vijayanagar | Oxford University  | 1940                           |
| 3           | Dr.C. Minakshi       | Administration and Social life under Pallavas    | D.K.Printworl<br>d | 1977                           |

**WEB SOURCES:**

- [https//Tamilelibrary.org.com](https://Tamilelibrary.org.com)
- [https//www.quora.com](https://www.quora.com)

**SYLLABUS DESIGNER :**

1. Dr. A. Amirthavalli, Head and Associate Professor of History.
2. Dr. A. Zarina Begum, Assistant Professor of History.
3. Dr. P. Savithri, Assistant Professor of History.

**INTELLECTUAL HISTORY OF THE 19<sup>TH</sup> CENTURY INDIA**

| Sem | Subject code | Category | Lecture Hr/Sem |    | Theory        |    | Practical | Credit |
|-----|--------------|----------|----------------|----|---------------|----|-----------|--------|
| 1   |              | Main     | 6 hr per week  | 90 | 6 hr per week | 90 | -         | 4      |

**COURSE OBJECTIVE**

- To enable the students to understand the Role of Religious Thinkers.
- To make the students to understand the Literatures and Scientist.

**COURSE OUTCOMES**

On the successful completion of the course the student will be able to ..

| CO Number  | CO Statement   | Knowledge Level (K1-K4) |
|------------|--|-------------------------|
| <b>CO1</b> | Examine the Nature of Intellectual History.            | <b>K2</b>               |
| <b>CO2</b> | Discuss about the Social Thinkers.                     | <b>K3</b>               |
| <b>CO3</b> | Explain the Role of Religious Thinkers.                | <b>K2</b>               |
| <b>CO4</b> | This course informs students about Political Thinkers. | <b>K3</b>               |
| <b>CO5</b> | Describe the Literatures and Scientists.               | <b>K2</b>               |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyse

**MAPPING WITH PROGRAMME OUTCOMES**

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | S   | M   | S   | M   |
| <b>CO2</b> | S   | M   | S   | M   | S   | M   |
| <b>CO3</b> | M   | S   | M   | S   | M   | S   |
| <b>CO4</b> | S   | M   | S   | M   | S   | M   |
| <b>CO5</b> | M   | S   | M   | S   | M   | S   |

S-Strong;

M- Medium;

L- Low

**UNIT-I Introduction****18Hrs**

Introduction – Definition of Intellectual History – Nature of Intellectual History.

**UNIT-II Social Thinkers****18 Hrs**

Social Thinkers; Raja Ram Mohan Roy – Iswar Chandra Vidya Sagar – Keshab Chandra Sen – Veerasalingam Pantulu – D.K.Karve – R.G. Bhandrakar – Pandita Ramabai – Jothiba phule – B.M.Malabari – Sir Syed Ahmed Khan.

**UNIT –III Religious Thinkers****18 Hrs**

Religious Thinkers; Debendranath Tagore – Dayanand Saraswathi – Ramakrishna Paramahansa – Vivekananda – Saint Ramalinga Adigal.

**UNIT –IV Political Thinker****18 Hrs**

Political Thinkers; Dadabhai Naoroji – M.G.Ranade – S.N. Banerjee – R.C.Dutt – G.k.Gohkale.

**UNIT-V Literatures and Scientists****18 Hrs**

Literatures and Scientists: Bankim Chandra Chatterjee – P.C.Roy – Srinivasa Ramanujar.

**TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Home test

**TEXT BOOKS**

| S.no | Authors                    | Title                    | Publishers          | Year Of Publication |
|------|----------------------------|--------------------------|---------------------|---------------------|
| 1    | V.S. Naryana               | Modern Indian Thought    | Orient Longman      | 1978                |
| 2    | S.K.Sharma & Urmila Sharma | Indian Political Thought | Atlantic Publishers | 2001                |

**REFERENCE BOOKS**

| S.no | Authors                   | Title                                | Publishers        | Year Of Publication |
|------|---------------------------|--------------------------------------|-------------------|---------------------|
| 1    | K.K. Datta                | A Social History of Modern India     | MacMillan Company | 1975                |
| 2    | B.L. . Grover & A. Grover | :A New Look at Modern Indian Histroy | S.S.Chand and Co  | 2006                |

**WEB SOURCES:**

- [www.alephbookcompany.com](http://www.alephbookcompany.com)
- <https://www.goodreads.com>

**SYLLABUS DESIGNER :**

1. Dr. A. Amirthavalli, Head and Associate Professor of History.
2. Dr. A. Zarina Begum, Assistant Professor of History.
3. Dr. P. Savithri, Assistant Professor of History.

**CONSTITUTIONAL HISTORY OF INDIA FROM 1773A.D. TO 1947 A.D.**

| Sem | Subject code | Category   | Lecture Hr/Sem |    | Theory        |    | Practical | Credit |
|-----|--------------|------------|----------------|----|---------------|----|-----------|--------|
| 1   |              | Elective I | 6 hr per week  | 90 | 6 hr per week | 90 | -         | 3      |

**COURSE OBJECTIVE**

- To enable the students to understand the significance of Regulating Act and Charter Act.
- To make the students to understand the Cripps Mission.

**COURSE OUTCOMES**

On the successful completion of the course the student will be able to ..

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | Highlight the significance of Regulating Act and Charter Act.               | <b>K2</b>               |
| <b>CO2</b> | State the Role of Queen's Proclamation.                                     | <b>K3</b>               |
| <b>CO3</b> | Identify the difference between Govt. Of India Act of 1909 and Act of 1919. | <b>K2</b>               |
| <b>CO4</b> | Discuss about the Round Table Conferences.                                  | <b>K3</b>               |
| <b>CO5</b> | Understand the Cripps Mission.  | <b>K2</b>               |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 - Analyse

**MAPPING WITH PROGRAMME OUTCOMES**

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | M   | S   | M   | S   | M   | S   |



|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO2</b> | S | M | S | M | S | M |
| <b>CO3</b> | M | S | M | S | M | S |
| <b>CO4</b> | S | M | S | M | S | S |
| <b>CO5</b> | M | S | M | S | M | M |

S- Strong;

M- Medium;

L- Low

## **UNIT-I**

**18 Hrs**

Regulating Act – Circumstances – Provisions –Merits and Demerits – Fox India's Bill -Pitt's India Act of 1784 – Charter Act of 1793, 1813, 1833, and 1853.

## **UNIT-II**

**18 Hrs**

Growth of Central Executive – Law Making Commissions – Queen's Proclamation – Govt of India Act of 1858 –India Council Act of 1861 and 1892.

## **UNIT-III**

**18 Hrs**

Govt of India Act of 1909- August Declaration 1917- Govt of India Act of 1919.

## **UNIT-I**

**18 Hrs**

Simon Commission – Round Table Conferences I,II & III Govt of India Act 1935.

## **UNIT-V**

**18 Hrs**

Cripps Mission –Cabinet Mission – Mountbatten proposals – Indian Independence Act of 1947.

## **TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Home test
- PPT Presentations.

## **TEXT BOOKS**

| <b>S.no</b> | <b>Authors</b> | <b>Title</b>  | <b>Publishers</b>     | <b>Year Of Publication</b> |
|-------------|----------------|---|-----------------------|----------------------------|
| 1           | R.C. Agarwal   | Constitutional Development and National Movement of India | S.Chand & Company Ltd | 1994                       |
| 2           | Sujata Ghosh   | UGC NET/SET(TRF &   | Arihant               | 2001                       |

|   |             |  |                       |      |
|---|-------------|--|-----------------------|------|
|   |             | LS) Paper II & Paper III                                   |                       |      |
| 3 | A.C.Kaput   | Principles of Political Science                            | S.Chand & Company Ltd | 1981 |
| 4 | N.Jayapalan | A History of Political Thought                             | Mehra                 | 1997 |
| 5 | B.L. Grover | A New Look At Modern Indian History from 1707 Modern Times | S.Chand & Company Ltd | 2008 |
| 6 | R.C.Agarwat | Constitutional Development and National Movement of India  | S.Chand & Company Ltd | 1998 |

### REFERENCE BOOKS

| S.no | Authors                            | Title   | Publishers        | Year Of Publication |
|------|------------------------------------|---|-------------------|---------------------|
| 1    | R.C. Agarwal                       | Nationlist movement constitutional Development of Indias    | S.Chand & Company | 1996                |
| 2    | G.S. Chhabra                       | Advanced dtidy in the History of modern india               | Sterling          | 1971                |
| 3    | D.Srinivasan                       | Indian Constitution   | Himalaya          | 2014                |
| 4    | D.Srinivasan                       | Indian Constitution Secur State and Sustainable Environment | Himalaya          | 2016                |
| 5    | R.C. Agarwal & Dr.MaheshBhat Nagar | Constitutional Development & National Movement of India     | S.Chand Company   | 2014                |

### WEB SOURCES:

- [www.nptel.ac.in](http://www.nptel.ac.in)
- <https://www.quora.com>
- [www.ebcwebstore.com](http://www.ebcwebstore.com)

**SYLLABUS DESIGNER :**

1. Dr. A. Amirthavalli, Head and Associate Professor of History.
2. Dr. A. Zarina Begum, Assistant Professor of History.
3. Dr. P. Savithri, Assistant Professor of History.

**HISTORY OF INDIA FROM 1707 A.D. TO 1885 A.D.**

| Sem | Subject code | Category | Lecture Hr/Sem |    | Theory       |    | Practical | Credit |
|-----|--------------|----------|----------------|----|--------------|----|-----------|--------|
| II  |              | Main     | 6hr per week   | 90 | 6hr per week | 90 | -         | 5      |

**COURSE OBJECTIVE**

- To enable the students to understand the Social Reforms.
- To make the students to understand the Indian National Congress.

**COURSE OUTCOMES**

On the successful completion of the course the student will be able to ..

| CO Number  | CO Statement                                | Knowledge Level<br>(K1-K4) |
|------------|---|----------------------------|
| <b>CO1</b> | Explain about the Coming of the Europeans.  | <b>K3</b>                  |
| <b>CO2</b> | Analyse the rise of British Power.          | <b>K2</b>                  |
| <b>CO3</b> | Describe the Social Reforms.                | <b>K3</b>                  |
| <b>CO4</b> | State about Indian National Congress.       | <b>K2</b>                  |
| <b>CO5</b> | Identify the involvement of Regulating Act. | <b>K3</b>                  |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 - Analyse

**MAPPING WITH PROGRAMME OUTCOMES**

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | S   | M   | S   | M   |
| <b>CO2</b> | M   | S   | S   | M   | S   | M   |
| <b>CO3</b> | S   | M   | M   | S   | M   | S   |
| <b>CO4</b> | M   | S   | S   | M   | S   | M   |
| <b>CO5</b> | S   | M   | M   | S   | M   | S   |

S- Strong;

M- Medium;

L- Low

**UNIT-I Coming of the Europeans****18 Hrs**

Coming of the Europeans-Anglo-French Rivalry- I,II,& III,Carnatic wars-Third battle of panipet.

**UNIT-II Rise of British power****18 Hrs**

Rise of British power –Robert Clive – Warren Hastings-Cornwallis-The Permanent Settlement - Wellesley.

**UNIT-III Social and Reformes****18 Hrs**

Lord Minto-Hastings- William Bentick- Reformes - RajaRam Mohan Roy-Ranjit Singh .

**UNIT-IV. Viceroy of India****18Hrs**

Lord Dalhousie-Policy of Annexationent -Event of 1857- Lord Canning- Lord Mayo- Lord Lytton- Lord Ripon-Lord Dufferin..

**UNIT –V Birth of Indian National Congress****18 Hrs**

Factors leading to the formation of Indian National Congress- Indian National Congress.

**TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Home test
- PPT Presentations.

**TEXT BOOKS**

| S.no | Authors                  | Title   | Publishers            | Year Of Publication |
|------|--------------------------|---|-----------------------|---------------------|
| 1    | D.S Joshi & S.V. Cholkar | History of Modern India from 1800 to 1964 A.D.            | S.Chand & Company Ltd | 1980                |
| 2    | B.L. Grover & S.Grover   | A New Look at Modern Indian History                       | Himalaya              | 1992                |
| 3    | R.C.Agarwal              | Constitutional Development and National Movement of India | S.Chand & Company Ltd | 2006                |
| 4    | K.B Keswani              | History of Modern India (1819 – 1964)                     | Himalaya              | 2001                |

|   |                  |  |                    |      |
|---|------------------|--|--------------------|------|
| 5 | Roy Kumar Pruthi | History of Modern India                  | Mohit              | 2005 |
| 6 | J.K.Chopra       | History of Modern India & Indian Culture | Unique             | 2010 |
| 7 | Bipan Chandra    | India,s Struggle for Independence        | Penguin Books Ltd. | 1989 |

### REFERENCE BOOKS

| S.no | Authors     | Title                                 | Publishers | Year Of Publication |
|------|-------------|---------------------------------------|------------|---------------------|
| 1    | L.P. Sharma | History of Medieval India             | Konar      | 1997                |
| 2    | L. Mehata   | Advance Study in the History of India | Sterling   | 1983                |
| 3    | S.R. Sharma | The Cresent In India Lakshmi Narain   | Agarwal    | 1983                |

### WEB SOURCE:

[www.haranandpublications.com](http://www.haranandpublications.com)

### SYLLABUS DESIGNER :

1. Dr. A. Amirthavalli, Head and Associate Professor of History.
2. Dr. A. Zarina Begum, Assistant Professor of History.
3. Dr. P. Savithri, Assistant Professor of History.

### HISTORY OF INDIA FROM 1885 A.D. TO 2001 A.D.

| Sem | Subject code | Categor y | Lecture Hr/Sem |    | Theory       |    | Practi cal | Credit |
|-----|--------------|-----------|----------------|----|--------------|----|------------|--------|
| II  |              | Main      | 6hr per week   | 90 | 6hr per week | 90 | -          | 5      |

### COURSE OBJECTIVE

- To enable the students to understand the significance of National Movement from 1909 to 1935.
- To make the students to understand the Role of Prime Minister.

### COURSE OUTCOMES

On the successful completion of the course the student will be able to ..

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| <b>CO1</b>       | Study the importance of Congress from 1885 to 1905.                | <b>K2</b>                      |
| <b>CO2</b>       | Bring out the significance of National Movement from 1909 to 1935. | <b>K3</b>                      |
| <b>CO3</b>       | Narrate the Government .of India Act 1935.                         | <b>K2</b>                      |
| <b>CO4</b>       | State the Role of Prime Ministers.                                 | <b>K3</b>                      |
| <b>CO5</b>       | Explain the Indian Foreign policy.                                 | <b>K2</b>                      |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 - Analyse

#### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | S          | S          | M          | S          | M          |
| <b>CO2</b> | S          | M          | M          | S          | M          | S          |
| <b>CO3</b> | M          | S          | S          | M          | S          | M          |
| <b>CO4</b> | S          | M          | M          | S          | M          | S          |
| <b>CO5</b> | M          | S          | S          | M          | S          | M          |

S- Strong;

M- Medium;

L- Low

#### **UNIT-I Congress from 1885 to 1905**

**18 Hrs**

Congress from 1885 to 1905 –Surat split – Partition of Bengal – Curzon.

#### **UNIT –II National Movement from 1909 to 1935**

**18 Hrs**

National Movement from 1909 to 1935 – Moderates- Extremists –Non Co – Operations –Khilafat – Civil Obedience Movement –Round Table Conferences.

#### **UNIT –III Govt. Of India Act 1935**

**18 Hrs**

Quit India Movement–India’s Independence- Partion – Reorganisation of States.

#### **UNIT –IV Prime Minister**

**18 Hrs**

Nehru Era –Lal Bahadur Shastri-Indira Gandhi – Rajv Gandhi –V.P. Singh- Narasimha Rao – Atal Bihari Vajpai

#### **UNIT – V India`s Foreign Policy**

**18 Hrs**

Growth of Education – Economic Development – Science and Technology

#### **TEACHING METHODOLOGY:**

- Class room teaching

- Assignments
- Discussions
- Home test
- PPT Presentations.

### TEXT BOOKS

| S.no | Authors                  | Title   | Publishers              | Year Of Publication |
|------|--------------------------|---|-------------------------|---------------------|
| 1    | D.S Joshi & S.V. Cholkar | History of Modern India from 1800 to 1964 A.D.            | S.Chand & Company Ltd   | 1980                |
| 2    | B.L. Grover & S.Grover   | A New Look at Modern Indian History                       | S. Chand & Company Ltd. | 1992                |
| 3    | R.C.Agarwal              | Constitutional Development and National Movement of India | S.Chand & Company Ltd   | 2006                |
| 4    | K.B Keswani              | History of Modern India (1819 – 1964)                     | Himalaya                | 1980                |
| 5    | Roy Kumar Pruthi         | History of Modern India                                   | Mohit                   | 2005                |
| 6    | J.K.Chopra               | History of Modern India & Indian Culture                  | Unique                  | 2010                |
| 7    | Bipan Chandra            | India,s Struggle for Independence                         | Penguin Books Ltd.      | 1989                |

### REFERENCE BOOKS

| S.no | Authors           | Title   | Publishers      | Year Of Publication |
|------|-------------------|---|-----------------|---------------------|
| 1    | S.C. Roy chaudhry | C History of modern India                                 | surjeet         | 2006                |
| 2    | V.D. Mahajan      | . India since 1526  | S.Chand & Co    | 1984                |
| 3    | R.C. Agarwal      | Constitutional Development and National movement of India | S.Chand&Co      | 1988                |
| 4    | Sathinanathier    | History of India  | S,viswanathan   | 1999                |
| 5    | Anup Chand Kapur  | Constitutional History of India                           | Niraj Prakasham | 1970                |

**WEB SOURCE:**

[www.haranandpublications.com](http://www.haranandpublications.com)

**SYLLABUS DESIGNER :**

1. Dr. A. Amirthavalli, Head and Associate Professor of History.
2. Dr. A. Zarina Begum, Assistant Professor of History.
3. Dr. P. Savithri, Assistant Professor of History.

**SOCIAL AND CULTURAL HISTORY OF TAMIL NADU FROM 1565 A.D. TO 2000A.D.**

| Sem | Subject code | Category | Lecture Hr/Sem |    | Theory       |    | Practical | Credit |
|-----|--------------|----------|----------------|----|--------------|----|-----------|--------|
| II  |              | Main     | 6hr per week   | 90 | 6hr per week | 90 | -         | 5      |

**COURSE OBJECTIVE**

- To enable the students to understand the social,Economical and Cultural condition of the Nayaks of Madurai.
- To make the students to understand the various kinds of Religions Developments.

**COURSE OUTCOMES**

On the successful completion of the course the student will be able to ..

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | Understand the Socio ,Economical and Cultural condition of the Nayaks of Madurai. | <b>K2</b>               |
| <b>CO2</b> | Explain about the Carnatic Nawabs and Marathas.                                   | <b>K2</b>               |
| <b>CO3</b> | Understand the various kinds of Religious Developments.                           | <b>K3</b>               |
| <b>CO4</b> | Describe about Social Reform Movements.   | <b>K2</b>               |
| <b>CO5</b> | Identify the Growth of Tamil Literature(1800-2000).                               | <b>K3</b>               |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 - Analyse

**MAPPING WITH PROGRAMME OUTCOMES**

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | S   | M   | S   | M   |
| <b>CO2</b> | M   | S   | M   | S   | M   | S   |
| <b>CO3</b> | S   | M   | S   | M   | S   | M   |



|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO4</b> | M | S | M | S | M | S |
| <b>CO5</b> | S | M | S | M | S | M |

S- Strong;

M-Medium;

L- Low

### **UNIT-I Nayaks of Madurai**

**18 Hrs**

Nayaks of Madurai, Chenji , Tanjore: Society Economic life –Religion-Literature-Art and Architecture.

### **UNIT-II Nawabs and Marathas**

**18 Hrs**

Tamil Nadu under Nawabs and Marathas of Tanjore: Social Condition-Religion Education-Literature-Art and Architecture-Fine Arts.

### **UNIT-III Religious developments**

**18 Hrs**

Religious developments: Hinduism-Revivalist Movements-Brahmo Samaj-Ramakrishna Mission-Theosophical Movement-Saiva Siddhantam-Mutts-Islam:Wahabi Movement-Sufism-Fakirs-Christianity and its Impact.

### **UNIT-IV Social Reform Movements**

**18 Hrs**

Social Reform Movements: Dalit Movement-Pandit C.Iyothee Thasar-Rettamalai Srinivasan-N.Sivaraji, Vaikunda Swamy Movement-Indian Role of tamin nadu in freedom struggle and Social Reforms-Self Respect Movement-Women Movements and Social Reforms (1800-2000).

### **UNIT-V Growth of Tamil Literature**

**18 Hrs**

Growth of Tamil Literature (1800-2000)-Prose-Novels-Dramas-Journals its Impact on Society-Vethanayagam Pillai-Mu.Varatharajan-Kalki-Jayakanthan-Sujatha-Ka.Na.Subramiyan-Manavai Mustafa – Bharathiyar – Bharathidasan – Kalki.

**TEACHING METHODOLOGY:**Class room teaching

- Assignments
- Discussions
- Home test
- PPT Presentations.

### **TEXT BOOKS**

| <b>S.no</b> | <b>Authors</b>  | <b>Title</b>                                  | <b>Publishers</b>    | <b>Year Of Publication</b> |
|-------------|-----------------|---|----------------------|----------------------------|
| 1           | N. Subrahmanian | History of Tamil Nadu (1565 – 1984 A.D. )     | Ennars               | 1928                       |
| 2           | Dr.Minakshi.C   | Administration and Social life under Pallavas | University of madras | 1977                       |

## REFERENCE BOOKS

| S.no | Authors        | Title   | Publishers           | Year Of Publication |
|------|----------------|---|----------------------|---------------------|
| 1    | T.V. Mahaligam | Adminstration and Social Life under Vijayanagar | University of madras | 1940                |
| 2    | A.. Devanesan  | History of Tamilnady                            | University of madras | 1977                |

## WEB SOURCES:

<https://Tamilibrary.org.com>

<https://www.quora.com>

## SYLLABUS DESIGNER :

1. Dr. A. Amirthavalli, Head and Associate Professor of History.
2. Dr. A. Zarina Begum, Assistant Professor of History.
3. Dr. P. Savithri, Assistant Professor of History.

## INTELLECTUAL HISTORY OF THE 20<sup>TH</sup> CENTURY INDIA

| Sem | Subject code | Categor y | Lecture Hr/Sem |    | Theory        |    | Practica l | Credit |
|-----|--------------|-----------|----------------|----|---------------|----|------------|--------|
| II  |              | Main      | 6hr per week   | 90 | 6 hr per week | 90 | -          | 4      |

## COURSE OBJECTIVE

- To enable the students to understand about the Political Thinkers.
- To make the students to understand the Role of Social Thinkers.

## COURSE OUTCOMES

On the successful completion of the course the student will be able to ..

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | Examine the India at the beginning of the 20 <sup>th</sup> Century.                  | K2                      |
| CO2       | Discuss about the Political Thinkers.  | K3                      |
| CO3       | Explain the Role of Social Thinkers.   | K2                      |
| CO4       | This course informs students about Socialists and Communists Science and Technology. | K3                      |
| CO5       | Describe about the Literature.   | K2                      |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 - Analyse

## MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | M   | S   | M   |
| CO2 | M   | S   | M   | S   | M   | S   |
| CO3 | S   | M   | S   | M   | S   | M   |
| CO4 | M   | S   | M   | S   | M   | S   |
| CO5 | S   | M   | S   | M   | S   | M   |

S- Strong;

M- Medium;

L- Low

### UNIT-I India at the beginning of the 20<sup>th</sup> Century

18 Hrs

India at the beginning of the 20<sup>th</sup> Century-1 -Social Condition- Economic Condition-Course of Freedom Movement.

### UNIT-II Political Thought

18 Hrs

Political Thought: B.G.Tilak- Lala Lajput Ray-B.C. Pal-Mahatma Gandhi- B.R.Ambedkar - S.V.Patel- Subhash - Chandra Bose- Nehru - Zakir Hussain Jayaprakash Narayan – Indira Gandhi.

### UNIT – III Social Thought

18 Hrs

Social Thought: Vinoba Bhave- Dr.Muthulakshmi Reddy- Periyar E.V.R- Mother Theresa.

### UNIT – IV Socialists and Communists, Science & Technology:

18 Hrs

Socialists and Communists, Science & Technology: M.N. Roy- S.A. Dange- Ram Manohar Lohia - E.M.S. Namboodripad - Sir. C.V.Raman - Homi.J.Bhabha-Jagadish Chandra Bose - Subramaniam Chandra Sekar - A.P.J.Abdul Kalam.

### UNIT-V Litterateurs

18 Hrs

Litterateurs; Rabindranath Tagore-Muhammed Iqbal- Subramaniam Bharathi- Thiru.Vi.Ka. – Sarojini Naidu – Kavimani Desigavinayagam Pillai.

### TEACHING METHODOLOGY:

- Class room teaching
- Assignments
- Discussions
- Home test
- PPT Presentations.

### TEXT BOOKS

| S.no | Authors  | Title                                | Publishers   | Year Of Publication |
|------|----------|--------------------------------------|--------------|---------------------|
| 1    | Bharathi | Mahatma Gandhi Man of the Millennium | S.Chand & Co | 2000                |

|   |            |   |                      |      |
|---|------------|---|----------------------|------|
| 2 | B.R. Nanda | Jawaharlal Nehru<br>Rebel and Statesman | Oxford<br>University | 1995 |
|---|------------|---|----------------------|------|

## REFERENCE BOOKS

| S.no | Authors                    | Title   | Publishers     | Year Of Publication |
|------|----------------------------|---|----------------|---------------------|
| 1    | B.L. Grover &<br>S. Grover | A New Look at Modern<br>Indian History, (From<br>1707 to the Modern<br>Times) | S.Chand& Co    | 2006                |
| 2    | V.S. Naravane              | Modern Indian<br>Thought  | Orient Longman | 1978                |

## WEB SOURCES:

<https://Tamilibrary.org.com>

<https://www.quora.com>

## SYLLABUS DESIGNER :

1. Dr. A. Amirthavalli, Head and Associate Professor of History.
2. Dr. A. Zarina Begum, Assistant Professor of History.
3. Dr. P. Savithri, Assistant Professor of History.

## REPUBLICAN CONSTITUTION

| Sem | Subject code | Categor y   | Lecture Hr/Sem |    | Theory       |    | Practica 1 | Credit |
|-----|--------------|-------------|----------------|----|--------------|----|------------|--------|
| II  |              | Elective II | 4hr per week   | 60 | 4hr per week | 60 | -          | 3      |

## COURSE OBJECTIVE

- To enable the students to understand the significance of the Indian Independence Act 1947..
- To make the students to understand the Role of Quasi Federal System.

## COURSE OUTCOMES

On the successful completion of the course the student will be able to ..

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | Highlight the significance of the Indian Independence Act1947. | K3                      |
| CO2       | State the Role of Quasi Federal System.                        | K2                      |

|            |   |           |
|------------|---|-----------|
| <b>CO3</b> | Explain Govt. Of the Union.                     | <b>K3</b> |
| <b>CO4</b> | Discuss about the Government of the State.      | <b>K2</b> |
| <b>CO5</b> | Understand about Organization of the Judiciary. | <b>K3</b> |

Knowledge Level : K1-Remember ; K2 –Understands ; K3 – Apply ; K4 - Analyse

### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | S          | M          |
| <b>CO2</b> | M          | S          | M          | S          | M          | S          |
| <b>CO3</b> | S          | M          | S          | M          | S          | M          |
| <b>CO4</b> | M          | S          | M          | S          | M          | S          |
| <b>CO5</b> | S          | M          | S          | M          | S          | M          |

S- Strong;

M- Medium;

L- Low

### **UNIT-I**

**15 Hrs**

The Indian Independence Act,1947-Constituent Assembly of India-Indian Constitution 1950-Features the Constitution-Fundamental Rights-Fundamental Duties-Directive Principles of State Policy.

### **UNIT-II**

**10Hrs**

Quasi Federal System-Nation-State-Federal Legislature-Division of powers - Central list - State list-Concurrent list.

### **UNIT-III**

**15 Hrs**

Government of the Union: the President-Prime Minister and the Council of Ministers-Constitution Parliament-Lok Sabha and Rajya Sabha-Functions of Parliament-Legislative Procedure-Ordinary bills Money bills-Financial bill.

### **UNIT-IV**

**10 Hrs**

Government of the States- Governor-Chief Minister and the Council of Ministers-Special Status of Jammu and Kashmir.

### **UNIT-V**

**10 Hrs**

Organization of the judiciary:The Supreme Court-Appointment of Judges - High Courts-Judicial Review Amendments of the Indian Constitution-Rights and Liabilities of the Public Servants.

### **TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Home test
- PPT Presentations.

## TEXT BOOKS

| S.no | Authors           | Title   | Publishers        | Year Of Publication |
|------|-------------------|---|-------------------|---------------------|
| 1    | .Durga Das Basu   | Introduction to the constitution of India         | Lexisnexis        | 2015                |
| 2    | Gran Ville Austin | The Indian Constitution, Corner stone of a nation | Oxford University | 1995                |

## REFERENCE BOOKS

| S.no | Authors        | Title                          | Publishers               | Year Of Publication |
|------|----------------|--------------------------------|--------------------------|---------------------|
| 1    | P.N.Bakshi     | Constitution of India          | Universal Law Publishing | 2016                |
| 2    | Madhav Khosala | The Indian Constitution        | Oxford University        | 2014                |
| 3    | K. Santhanam,  | Union-State relations in India | Oxford University        | 2012                |

## WEB SOURCES:

[www.nptel.ac.in](http://www.nptel.ac.in)

<https://www.quora.com>

[www.ebcwebstore.com](http://www.ebcwebstore.com)

## SYLLABUS DESIGNER :

1. Dr. A. Amirthavalli, Head and Associate Professor of History.
2. Dr. A. Zarina Begum, Assistant Professor of History.
3. Dr. P. Savithri, Assistant Professor of History.

## SELF STUDY

## GEOGRAPHY OF INDIA WITH SPECIAL REFERENCE TO TAMILNADU

### UNIT - I

Location - Physical features - Major Rivers - Weather & Climate - Monsoon, Rainfall .

## **UNIT - II**

Natural resources - Soil, Water, Forest, Minerals and Wild life – Agricultural Pattern - Livestock - Fisheries - Industries.

## **UNIT - III**

Major industries - Growth and Development - Social - Cultural geography -Population: Growth , Density and Distribution - Racial, Linguistic and major tribes.

## **UNIT - IV**

Oceanography - Bottom relief features of Indian Ocean, Arabian Sea and Bay of Bengal.

## **UNIT - V**

Basics of Geospatial Technology : Geographical Information System - Global Navigation Satellite System.

# **DEPARTMENT OF COMMERCE- UG**

## **B.COM GENERAL**

### **PROGRAMME EDUCATIONAL OBJECTIVES (PEO)**

**PEO 1:** To excel with the much needed business education, to ensure that students to be more competitive for employment and higher education.

**PEO 2:** To develop a broad range of business skills and knowledge, development of general and specific capabilities to meet the current and future expectation of business, industries and economy at the national and global level.

### **PROGRAMME OUTCOMES (PO)**

**PO 1:** To have comprehensive knowledge of finance, accounting, taxation, economics and business laws.

**PO 2:** To equip with professional, inter-personal and entrepreneurial skills for economic and social growth.

**PO 3:** To gear up with updated knowledge in implementing business practices.

**PO 4:** To acquire effective skills like communication, decision making, problem solving in business activities.

**PO 5:** To blend knowledge, skill and attitude that will sustain an environment of learning and creativity.

**PO 6:** To impart value based and job oriented education, which ensures that the students are trained into up-to-date.

**DEPARTMENT OF COMMERCE**

**B.COM [GENERAL] CBCS PATTERN**

**THE COURSE OF STUDY AND THE SCHEME OF EXAMINATION**

| S.NO         | PART | STUDY<br>COMPONENTS | INS.<br>HRS./WEEK | CREDIT | TITLE OF THE<br>PAPER        | CIA | UNIV<br>EXAM | TOTAL |
|--------------|------|---------------------|-------------------|--------|------------------------------|-----|--------------|-------|
| SEMESTER - I |      |                     |                   |        |                              |     |              |       |
| 1            | I    | Language –I         | 6                 | 4      | Tamil –I /other<br>language  | 25  | 75           | 100   |
| 2            | II   | English –I          | 6                 | 4      | English -I                   | 25  | 75           | 100   |
| 3            | III  | Core Paper -I       | 6                 | 4      | Financial<br>Accounting -I   | 25  | 75           | 100   |
| 4            | III  | Core Paper –II      | 4                 | 4      | Business<br>Organization     | 25  | 75           | 100   |
| 5            | III  | Allied Paper –I     | 6                 | 5      | Indian<br>Economy -I         | 25  | 75           | 100   |
| 6            | IV   | EVS                 | 2                 | 2      | EVS                          | 25  | 75           | 100   |
|              |      |                     | 30                | 23     |                              | 150 | 450          | 600   |
| SEMESTER -II |      |                     |                   |        |                              |     |              |       |
| 1            | I    | Language –II        | 6                 | 4      | Tamil –II /other<br>language | 25  | 75           | 100   |
| 2            | II   | English –II         | 4                 | 4      | English -II                  | 25  | 75           | 100   |
| 3            | III  | Core Paper –III     | 6                 | 4      | Financial<br>Accounting -II  | 25  | 75           | 100   |
| 4            | III  | Core Paper –IV      | 4                 | 4      | Business<br>Communication    | 25  | 75           | 100   |
| 5            | III  | Allied Paper –II    | 6                 | 5      | Indian<br>Economy -II        | 25  | 75           | 100   |
| 6            | IV   | Value<br>Education  | 2                 | 2      | Value<br>Education           | -   | 50           | 50    |
| 7            | IV   | Soft Skill          | 2                 | 1      | Soft Skills                  | -   | 50           | 50    |
|              |      |                     | 30                | 24     |                              | 125 | 475          | 600   |
| SEMESTER III |      |                     |                   |        |                              |     |              |       |
| 1            | I    | Core Paper –V       | 6                 | 4      | Corporate<br>Accounting      | 25  | 75           | 100   |
| 2            | II   | Core Paper –VI      | 5                 | 4      | Legal Aspects of<br>Business | 25  | 75           | 100   |
| 3            | III  | Core Paper –VII     | 4                 | 4      | Modern<br>Banking            | 25  | 75           | 100   |
| 4            | III  | Core Paper –        | 5                 | 4      | Business                     | 25  | 75           | 100   |



|                      |     |                         |           |           |   |            |            |            |
|----------------------|-----|-------------------------|-----------|-----------|---|------------|------------|------------|
|                      |     | VIII                    |           |           | Statistics and Operation Research-I   |            |            |            |
| 5                    | III | Allied Paper – III      | 6         | 5         | Business Economics -I   | 25         | 75         | 100        |
| 6                    | IV  | Skill Based Subject –I  | 2         | 2         | Business Ethics   | -          | 50         | 50         |
| 7                    | IV  | Non Major –I            | 2         | 2         | Advertising   | -          | 50         | 50         |
|                      |     |                         | <b>30</b> | <b>25</b> |   | <b>125</b> | <b>475</b> | <b>600</b> |
| <b>SEMESTER - IV</b> |     |                         |           |           |   |            |            |            |
| 1                    | III | Core Paper –IX          | 6         | 4         | Advanced Corporate Accounting   | 25         | 75         | 100        |
| 2                    | III | Core Paper –X           | 5         | 4         | Business Management   | 25         | 75         | 100        |
| 3                    | III | Core Paper –XI          | 4         | 3         | Company Law   | 25         | 75         | 100        |
| 4                    | III | Core Paper –XII         | 5         | 4         | Business Statistics and Operation Research- II  | 25         | 75         | 100        |
| 5                    | III | Allied Paper – IV       | 6         | 5         | Business Economics -II  | 25         | 75         | 100        |
| 6                    | IV  | Skill Based Subject –II | 2         | 2         | Consumerism (With Practical)  | -          | 50         | 50         |
| 7                    | IV  | Non Major –II           | 2         | 2         | Salesmanship  | -          | 50         | 50         |
|                      |     |                         | <b>30</b> | <b>24</b> |   | <b>125</b> | <b>475</b> | <b>600</b> |
| <b>SEMESTER - V</b>  |     |                         |           |           |   |            |            |            |
| 1                    | III | Core Paper – XIII       | 6         | 4         | Cost accounting - I   | 25         | 75         | 100        |
| 2                    | III | Core Paper – XIV        | 5         | 4         | Modern Marketing  | 25         | 75         | 100        |
| 3                    | III | Core Paper –XV          | 6         | 4         | Management Accounting -I  | 25         | 75         | 100        |
| 4                    | III | Elective -I             | 6         | 4         | (To choose one out of 2)<br>1. Income Tax law and practice –I<br>2. Logistics and Supply Chain Management | 25         | 75         | 100        |
| 5                    | III | Elective -II            | 5         | 3         | (To choose one out of 2)<br>1. Entrepreneurial  | 25         | 75         | 100        |

|                      |     |                             |            |            |   |            |            |             |
|----------------------|-----|-----------------------------|------------|------------|---|------------|------------|-------------|
|                      |     |                             |            |            | Development<br>2. Elements of<br>Insurance                                    |            |            |             |
| 6                    | IV  | Skill Based<br>Subject –III | 2          | 2          | Human Resource<br>Management  | -          | 50         | 50          |
|                      |     |                             | <b>30</b>  | <b>21</b>  |   | <b>125</b> | <b>425</b> | <b>550</b>  |
| <b>SEMESTER - VI</b> |     |                             |            |            |   |            |            |             |
| 1                    | III | Core paper –<br>XVII        | 6          | 4          | Cost accounting -<br>II   | 25         | 75         | 100         |
| 2                    | III | Core paper –<br>XVIII       | 6          | 4          | Management<br>Accounting -II  | 25         | 75         | 100         |
| 3                    | III | Core paper –<br>XIX         | 6          | 4          | Income Tax law<br>and practice -II  | 25         | 75         | 100         |
| 4                    | III | Elective –III               | 5          | 3          | (To choose one out<br>of 2)<br>1. Financial<br>Management<br>2. E-Commerce    | 25         | 75         | 100         |
| 5                    | III | Elective -IV                | 5          | 3          | (To choose one out<br>of 2)<br>1. Practical<br>Auditing<br>2. Business Ethics | 25         | 75         | 100         |
| 6                    | IV  | Skill Based<br>Subject –IV  | 2          | 2          | Goods and Services<br>Tax(GST)  | -          | 50         | 50          |
| 7                    |     | Extension<br>Activities     | -          | 3          | Extension<br>Activities   | 100        | 0          | 100         |
|                      |     |                             | <b>30</b>  | <b>23</b>  |   | <b>225</b> | <b>425</b> | <b>650</b>  |
|                      |     | <b>Total</b>                | <b>180</b> | <b>140</b> |   |            |            | <b>3600</b> |

### CONSOLIDATED STATEMENT

| PART          | SUBJECT                | PAPER<br>S | HOURS | CREDI<br>T | TOTAL<br>CREDIT<br>S | MARKS | TOTAL<br>MARKS |
|---------------|------------------------|------------|-------|------------|----------------------|-------|----------------|
| Part – I      | Language               | 2          | 12    | 4          | 8                    | 100   | 200            |
| Part – II     | English                | 2          | 10    | 4          | 8                    | 100   | 200            |
| Part –<br>III | Allied (Odd Semester)  | 2          | 12    | 5          | 10                   | 100   | 200            |
|               | Allied (Even Semester) | 2          | 12    | 5          | 10                   | 100   | 200            |
|               | Electives              | 3          | 15    | 3          | 9                    | 100   | 300            |
|               | Core                   | 19         | 101   | 4-3        | 75                   | 100   | 1900           |
| Part –<br>IV  | Environmental Science  | 1          | 2     | 2          | 2                    | 100   | 100            |
|               | Soft Skills            | 1          | 2     | 1          | 1                    | 50    | 50             |
|               | Value Education        | 1          | 2     | 2          | 2                    | 50    | 50             |

|          |                             |   |            |   |            |     |             |
|----------|-----------------------------|---|------------|---|------------|-----|-------------|
|          | Language and others/<br>NME | 2 | 4          | 2 | 4          | 50  | 100         |
|          | Skill Based                 | 4 | 8          | 2 | 8          | 50  | 200         |
| Part – V | Extension Activities        | 1 | -          | 3 | 3          | 100 | 100         |
|          | <b>Total</b>                |   | <b>180</b> |   | <b>140</b> |     | <b>3600</b> |

### Financial Accounting - I

| SEM | Subject Code | Category | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
| I   |              | Core 1   | 6 hrs per week | 90 | 6 hrs per week | 90 | -         | 4      |

### COURSE OBJECTIVE

- The main objective of this course is to develop conceptual understanding of the fundamentals of Financial Accounting systems
- To enable the students to take up higher studies like CA, ICWA and ACS with ease and confidence.

### COURSE OUTCOME

On the successful completion of the course, the students will be able

| CO Number  | CO Statement   | Knowledge Level (K1-K4) |
|------------|--|-------------------------|
| <b>CO1</b> | To understand the basic Principles and practical Applications of Accounting                  | K1                      |
| <b>CO2</b> | To have practical knowledge in the preparation of Double Entry System                        | K2                      |
| <b>CO3</b> | To draft the Final Accounts as per the Accounting standards                                  | K3                      |
| <b>CO4</b> | To acquire practical knowledge in Calculation of fire insurance and depreciation calculation | K2                      |
| <b>CO5</b> | To gain expertise in preparation of Single Entry System                                      | K3                      |

*Knowledge Level : K1- Remember; K2 – Understand; K3 – Apply; K4 - Analyze*

## MAPPING WITH PROGRAMME OUTCOMES

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | M   | S   | M   |
| CO2 | S   | S   | M   | M   | M   | S   |
| CO3 | M   | S   | M   | M   | M   | S   |
| CO4 | S   | M   | M   | S   | M   | M   |
| CO5 | M   | S   | S   | M   | M   | M   |

S- Strong

M – Medium

L – Low

### UNIT – I Introduction to Accounting

12 Hrs

Meaning of Accounting – Objectives of Accounting – Advantages and Disadvantages of Accounting – Groups Interested in Accounting Information – Basic Accounting Concepts and Conventions.

### UNIT – II Double Entry System of Accounts

15 Hrs

Double Entry System – Concepts – Meaning – Advantages and Disadvantages - Journal – Ledger – Trial Balance – Rectification of Errors (Simple problems only)

### UNIT – III Final Accounts

17 Hrs

Introduction – Objectives of preparing of final Accounts – Trading Account – Profit and Loss Account – Balance Sheet – Various Adjustments, Classifications of Assets and Liabilities – for sole proprietorship concern only.

### UNIT – IV Depreciation Accounting and Fire Insurance Claims

20 Hrs

Concept of depreciation – Causes – Objectives – Need for providing Depreciation – Methods of providing depreciation – Straight line Method – Diminishing Balance Method (Change in method of Depreciation excluded) – Fire Insurance claims – Computation of claim to be lodged for loss of stock – Gross Profit Ratio – Average Clause – Average due date.

### UNIT – V Single Entry System of Accounting

26 Hrs

Meaning – Definition – Features – Advantages – Limitations of Single Entry System – Differences between Double Entry System and Single Entry System. Methods of Calculation of Profit – Statement of Affairs method and Conversion Method – Difference

**DISTRIBUTION OF MARKS: Theory 20% and Problems 80%**

### TEACHING METHODOLOGY:

- Class Room Teaching

- Assignments
- Discussions
- Home Test
- PPT Presentations

#### TEXT BOOKS:

| S.No | Authors              | Title of the Book    | Publication         | Year of Publication |
|------|----------------------|----------------------|---------------------|---------------------|
| 1    | T.S.Reddy & A.Murthy | Financial Accounting | Margham Publication | 2018                |

#### REFERENCE BOOKS :

| S.No | Authors                                      | Title of the Book    | Publication                                     | Year of Publications |
|------|--|----------------------|---|----------------------|
| 1    | S.P.Jain& K.L.Narang                         | Advanced Accountancy | Kalyani Publications, New Delhi, Ludhiana.      | 2016                 |
| 2    | R.L.Gupta                                    | Advanced Accounting  | Sultan Chand & Co.                              | 2015                 |
| 3    | M.C.Shukla and T.S.Grewal                    | Financial Accounting | Sultan Chand & Co.                              | 2014                 |
| 4    | K.Murugadoss, M.Jaya, V.Charulatha, D.Baskar | Financial Accounting | Vijay Nicole Imprints Private Limited, Chennai. | 2016                 |

#### SYLLABUS DESIGNER:

1. Dr.A .SudarVizhi, Assistant Professor of Commerce.
2. Mrs.S.Sasikala, Assistant Professor of Commerce.

#### Business Organisation

| SEM | Subject Code | Category | Lecture        |    | Theory |        | Practical | Credit |
|-----|--------------|----------|----------------|----|--------|--------|-----------|--------|
| I   |              | Core     | 4 hrs per week | 60 | --     | 54 Hrs | 6 hrs     | 4      |

#### COURSE OBJECTIVE:

This course aims to provide the students, the knowledge of how to organize a business in this globalised area.

#### COURSE OUTCOMES:

On the successful completion of the course, the students will be able

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K1-K4)</b> |
|------------------|---|--------------------------------|
| <b>CO1</b>       | To introduce about the business and its evolution during recent times                         | K2                             |
| <b>CO2</b>       | To assist the students to identify the different forms of business organizations.             | K3                             |
| <b>CO3</b>       | To understand the proper location of industry and the factors influencing the plant location. | K1                             |
| <b>CO4</b>       | To gain knowledge of various stock exchanges and its working regulation in India              | K2                             |
| <b>CO5</b>       | To learn the ethical practices and social responsibilities of business                        | K3&K4                          |

*Knowledge Level : K1- Remember; K2 – Understand; K3 – Apply; K4 - Analyze*

#### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | M          | M          | M          | M          | M          |
| <b>CO2</b> | M          | S          | M          | M          | S          | S          |
| <b>CO3</b> | M          | S          | S          | M          | S          | M          |
| <b>CO4</b> | S          | M          | S          | S          | M          | S          |
| <b>CO5</b> | M          | S          | S          | S          | M          | M          |

**S- Strong;**

**M – Medium ;**

**L- Low**

#### **UNIT-I Introduction to Business and Profession**

**8 hrs**

Business – Meaning – Definition- Nature and Scope – Evolution of Business – Role of profit in business. Profession – meaning- skills required for professionals- difference between business and profession.

#### **UNIT – II Business Organization and its types**

**14 hrs**

Business organization – meaning- characteristics, importance, organizational structure, types of business organization- Sole proprietorship – Partnership firm – Joint Hindu family – Joint Stock Companies – Co-operative Societies - Public utilities – Public sector Vs Private sector.

#### **UNIT-III Location**

**12 hrs**

Location of industry – Factors influencing location – Size of industry – Optimum firm – Advantages of Large Scale operation – Limitations of Small Scale Operation – Industrial Estates – District Industries Centres [DIC].

#### **UNIT-IV Stock Exchange**

**10 hrs**

Stock Exchange – Powers and Functions – Types – Working regulation of Stock Exchanges in India

**UNIT –V Ethics and Social Responsibility of Business**

**10 hrs**

Business Ethics – Meaning, definition and Importance – factors influencing Business ethics – Unethical Practices in Business.

Social Responsibility – Meaning, need for Social Responsibility – Social Responsibility towards various Stakeholders.

**PRACTICAL CLASSES:**

**6 Hours**

- To find out the ethical practices followed by Indian business people.
- To collect information about the social responsibility adopted by the small traders towards various stakeholders.

**TEACHING METHODOLOGY:**

- Class Room Teaching
- Assignments
- Discussions
- Home Test
- PPT Presentations

**TEXT BOOKS:**

| S.no | Authors     | Title                                | Publishers            | Year of Publication |
|------|-------------|--------------------------------------|-----------------------|---------------------|
| 1    | C.B. Gupta  | Business Organisation and Management | Sultan chand and sons | 2012                |
| 2.   | L.M. Prasad | Business Organisation                | Sultan chand and sons | 2015                |

**REFERENCE BOOKS:**

| S.NO | AUTHORS                       | TITLE                                | PUBLISHERS            | YEAR OF PUBLICATION |
|------|-------------------------------|--------------------------------------|-----------------------|---------------------|
| 1    | P.C Tulsian and Vishal Pandey | Business Organisation and Management | Sultan chand and sons | 2014                |

**SYLLABUS DESIGNER:**

1. Dr.T.Bharathi, Assistant Professor of Commerce.
2. Mrs.P.Indhumathi, Assistant Professor of Commerce.

## Financial Accounting - II

| SEM | Subject Code | Category | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
| II  |              | Core 3   | 6 hrs per week | 90 | 6 hrs per week | 90 |           | 4      |

### COURSE OBJECTIVE

- The objective of this paper is to help the students to acquire conceptual knowledge of financial accounting.
- To develop the skills for recording the various kinds of Business Transactions.

### COURSE OUTCOMES:

On the successful completion of the course, the students will be able

| CO Number  | Co Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To learn the basic concepts in preparing the branch accounts  | K2                      |
| <b>CO2</b> | To understand the preparation of Department Accounts  | K2                      |
| <b>CO3</b> | To learn the procedure for preparing and recording Hire Purchase System of purchase.                  | K1                      |
| <b>CO4</b> | To understand procedures while admitting a partner at the time Admission and Retirement of a partner. | K2                      |
| <b>CO5</b> | To acquire knowledge on settlements of partners at the time of Dissolution of a partnership           | K2                      |

*Knowledge Level : K1- Remember; K2 – Understand; K3 – Apply; K4 – Analyze*

### MAPPING WITH PROGRAMME OUTCOMES

| Cos        | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | M   | M   | M   |
| <b>CO2</b> | S   | S   | M   | M   | S   |
| <b>CO3</b> | M   | S   | M   | M   | S   |
| <b>CO4</b> | S   | M   | M   | S   | M   |
| <b>CO5</b> | M   | S   | S   | M   | M   |

S- Strong      M – Medium      L – Low

### UNIT – I Branch Accounting

**12 Hrs**

Branch Accounts – Objectives of Branch Accounts – Types of Branches –Debtors system [at cost price and invoice price] – Stock and Debtors system – Incorporation of Branch Trial Balance – [Foreign Branch Excluded] [Only Simple Problems].



**UNIT – II Department Accounting****15 Hrs**

Meaning – Objectives – Need – Distinction between departments and Branches – Advantages – Apportionment of Indirect Expenses – Inter departmental Transfers at cost price and selling price – Preparation of departmental Trading, Profit, Loss Account and Balance Sheet. (Simple problems)

**UNIT – III Hire Purchase System****17 Hrs**

Meaning and features of Hire Purchase System – Important Terms – Calculation of Interest – Books of Hire Purchases and Books of Hire Vendor – Default and Repossession (Simple problems)

**UNIT – IV Partnership Accounts – I****20 Hrs**

Admission of Partner – Calculation of New Profit Ratio – Sacrificing Ratio – Revaluation of Assets and Liabilities – Calculation of Goodwill – Treatment of Goodwill – Retirement of a partner – Death of a partner.

**UNIT – V Partnership Accounts – II****26 Hrs**

Meaning of Dissolution – Modes of Dissolution – Settlement of Accounts – Accounting Treatment – Insolvency of a partner – Insolvency of all partners – Garner Vs Murray piecemeal Distribution – Proportionate capital method – Maximum Loss Method.

**DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%****TEACHING METHODOLOGY:**

- Class Room Teaching
- Assignments
- Discussions
- Home Test
- PPT Presentations

**TEXT BOOKS:**

| <b>S.No</b> | <b>Name of the Book</b> | <b>Authors</b>        | <b>Publication</b>       | <b>Year of Publication</b> |
|-------------|-------------------------|-----------------------|--------------------------|----------------------------|
| 1           | Financial Accounting    | T.S.Reddy<br>A.Murthy | & Margham<br>Publication | 2018                       |

**REFERENCE BOOKS:**

| <b>S.No</b> | <b>Name of the Book</b> | <b>Authors</b>           | <b>Publication</b>                    | <b>Year of Publication</b> |
|-------------|-------------------------|--------------------------|---------------------------------------|----------------------------|
| 1           | Advanced Accountancy    | S.P.Jain<br>K.L.Narang   | & Kalyani Publications,<br>New Delhi, | 2016                       |
| 2           | Advanced Accounting     | R.L.Gupta                | Sultan Chand & Co.                    | 2015                       |
| 3           | Financial Accounting    | M.C.Shukla<br>T.S.Grewal | and Sultan Chand & Co.                | 2017                       |

4 Financial Accounting K.Murugadoss, M.Jaya, V.Charulatha, D.Baskar Vijay Nicole Imprints Private Limited, Chennai. 2019

**SYLLABUS DESIGNER:**

1. Dr.A .SudarVizhi, Assistant Professor of Commerce.

2. Mrs.S.Sasikala, Assistant Professor of Commerce.

**Business Communication**

| SEM | Subject Code | Category | Lecture       |    | Theory        |    | Practical | Credit |
|-----|--------------|----------|---------------|----|---------------|----|-----------|--------|
| II  |              | Core     | 4hrs per week | 60 | 4hrs per week | 60 |           | 4      |

**COURSE OBJECTIVE**

To equip students of the B.Com course effectively to acquire skills in reading, writing and communication, as also use to draft business Letters and business reports.

**COURSE OUTCOMES:**

On the successful completion of the course, the students will be able

| CO Number  | CO Statement   | Knowledge Level<br>(K1 – K4) |
|------------|--|------------------------------|
| <b>CO1</b> | To understand process and effectiveness of Communication.                      | K1                           |
| <b>CO2</b> | To understand and practice the essentials of effective business communication  | K2                           |
| <b>CO3</b> | To draft circulars, office communications and business letters professionally. | K2                           |
| <b>CO4</b> | To draft job application letter and resume in an effective manner.             | K2                           |
| <b>CO5</b> | To understand the essential of writing report.                                 | K1                           |

*Knowledge Level : K1- Remember; K2 – Understand; K3 – Apply; K4 - Analyze*

## MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | M   | S   | M   | S   | M   | M   |
| CO2 | S   | S   | S   | S   | M   | M   |
| CO3 | M   | S   | S   | S   | M   | M   |
| CO4 | M   | M   | S   | M   | S   | S   |
| CO5 | M   | S   | S   | M   | M   | S   |

S-Strong; M-Medium; L-Low

### Unit - I Introduction to Communication

15 hrs

Communication - Meaning -Definition – Objectives - Process of Communication - Importance of Communication - Types of communication - Barriers to Effective Communication.

### Unit – II Introduction to business correspondence

15 hrs

Business communication – Features of Business Communication – Guidelines (The 7Cs) for Effective Business Communication – Structure and Layout of Business Letter – Need for Business Letter – Functions of a Business Letters – Classification of Business Letter.

### Unit – III Types of Business Letters

10 hrs

Various Types of Business Letters – Drafting - Letters of Enquiry – Offers, Quotations, Orders and Complaints.

### Unit – IV Letters of Application

10 hrs

Letters of Application – Essential Qualities – Letters of Application with CV, Types of Resumes – Application with Reference to an Advertisement.

### Unit – V Business Report

10 hrs

Business Report – Importance – Characteristics – Structures and layout of Reports -Types – Reports by individuals and committee.

## TEACHING METHODOLOGY:

- Class Room Teaching
- Assignments
- Discussions
- Home Test
- PPT Presentations

**REFERENCE BOOKS:**

| S.No | Author Name                   | Title of the book                | Publication                     | Year |
|------|-------------------------------|----------------------------------|---------------------------------|------|
| 1.   | N.S.Raghunathan & B.Santhanam | Business communication           | Margham Publications            | 2017 |
| 2.   | Dr. K.Sundar                  | Business communication           | Vijay Nicole Publications       | 2018 |
| 3.   | Ramesh and Pattanchetti       | Business communication,          | R.Chand& Co                     | 2018 |
| 4.   | R.Senapathi                   | Communication skills             | Lakshmi publications            | 2009 |
| 5.   | Dr.N.Premavathy               | Business Communication , (Tamil) | Sri Vishnu Publications Chennai | 2009 |

**SYLLABUS DESIGNER:**

1. Dr. R.Padmaja, Head and Associate Professor of Commerce.
2. Dr.G.Bhavani, Assistant Professor of Commerce.
3. Ms.J.Janani, Assistant Professor of Commerce.

**DEPARTMENT OF COMMERCE- PG****Programme Educational Objectives (PEO):**

**PEO 1:** To acquire wide spectrum of managerial skills along with competency building qualities in specific areas of business studies.

**PEO 2:** To offer quality education in the field of commerce at a higher level. To facilitate students in pursuing research work in the latest and upcoming trends of study in commerce.

**Programme Outcomes (PO) :**

**PO 1:** To enhance the horizon of knowledge in various fields of commerce, economics and finance.

**PO 2:** To inculcate the knowledge of business and the techniques of managing Marketing, Insurance, International trade and Banking practices.

**PO 3:** To develop critical decision making skills through cost and management techniques, financial analysis and economic analysis.

**PO 4:** To attain proficiency in competitive exams like UGC NET and other competitive exams.

**PO 5:** To create awareness in application oriented research in business studies.

**PO 6:** To satisfy educational entrance requirements of relevant professional bodies or to launch a career in professional accounting.

# **DEPARTMENT OF COMMERCE - PG**

## **MASTER OF COMMERCE**

**(With effect from 2019-2020)**

| S.No   | Study Components |            | Hrs/Week | Credit | Title of the Paper  | Max. Marks |     |       |
|--|------------------|------------|----------|--------|---|------------|-----|-------|
|  | Course Title     |            |          |        |   | C.A        | Sem | Total |
| SEMESTER I   |                  |            |          |        |   |            |     |       |
| 1  | Main             | Paper I    | 6        | 5      | Advanced Financial Management   | 25         | 75  | 100   |
| 2  | Main             | Paper II   | 6        | 5      | Managerial Economics  | 25         | 75  | 100   |
| 3  | Main             | Paper III  | 6        | 4      | Marketing Management  | 25         | 75  | 100   |
| 4  | Main             | Paper IV   | 6        | 4      | Advanced Business Statistics  | 25         | 75  | 100   |
| 5  | Elective I       | Paper I    | 6        | 3      | (To Choose one out of 2)1.Dynamics of Banking<br>2.Strategic Management                     | 25         | 75  | 100   |
| Total  |                  |            | 30       | 21     |   | 125        | 375 | 500   |
| Self Study Course: Personality Development during I Semester with extra credit = 2 |                  |            |          |        |   |            |     |       |
| SEMESTER II  |                  |            |          |        |   |            |     |       |
| 6  | Main             | Paper V    | 6        | 5      | Human Resource Management   | 25         | 75  | 100   |
| 7  | Main             | Paper VI   | 5        | 5      | International Economics   | 25         | 75  | 100   |
| 8  | Main             | Paper VII  | 5        | 4      | Advanced Accounting   | 25         | 75  | 100   |
| 9  | Main             | Paper VIII | 6        | 4      | Quantitative Techniques for Business Decisions  | 25         | 75  | 100   |
| 10   | Elective II      | Paper II   | 6        | 3      | (To Choose one out of 2)<br>1. Insurance and Risk Management<br>2. Total Quality Management | 25         | 75  | 100   |
| 11   | Compulsory Paper |            | 2        | 2      | Human Rights  | 25         | 75  | 100   |

|   |                        |            |    |    |  |     |     |     |
|---|------------------------|------------|----|----|--|-----|-----|-----|
|   | Total                  |            | 30 | 23 |  | 150 | 450 | 600 |
| SEMESTER III  |                        |            |    |    |  |     |     |     |
| 12  | Main                   | Paper IX   | 6  | 5  | GST – Goods and Services Tax   | 25  | 75  | 100 |
| 13  | Main                   | Paper X    | 6  | 5  | Organizational Behavior  | 25  | 75  | 100 |
| 14  | Main                   | Paper XI   | 6  | 5  | Advanced Cost Accounting   | 25  | 75  | 100 |
| 15  | Main                   | Paper XII  | 6  | 5  | Research Methodology   | 25  | 75  | 100 |
| 16  | Elective III           | Paper III  | 6  | 3  | (To Choose one out of 2)<br>1. Business Environment<br>2. Sales and Advertising Management | 25  | 75  | 100 |
| Total   |                        |            | 30 | 23 |  | 125 | 375 | 500 |
| Self Study Course: Project Management during III Semester with extra credit = 2 |                        |            |    |    |  |     |     |     |
| SEMESTER IV   |                        |            |    |    |  |     |     |     |
| 17  | Main                   | Paper XIII | 6  | 5  | Income Tax and Tax Planning  | 25  | 75  | 100 |
| 18  | Main                   | Paper XIV  | 6  | 5  | Advanced Management Accounting   | 25  | 75  | 100 |
| 19  | Main                   | Paper XV   | 6  | 5  | Security Analysis and Portfolio Management   | 25  | 75  | 100 |
| 20  | Elective IV            | Paper IV   | 6  | 3  | (To Choose one out of 2)<br>1. Financial Markets2. Services Marketing                      | 25  | 75  | 100 |
| 21  | Project with Viva Voce |            | 6  | 5  | -  | 25  | 75  | 100 |
| Total   |                        |            | 30 | 23 |  | 125 | 375 | 500 |

**CONSOLIDATED STATEMENT**

| Subject    | Papers    | Hours      | Credit | Total Credits | Marks | Total marks |
|------------|-----------|------------|--------|---------------|-------|-------------|
| Main       | 15        | 88         | 4-5    | 71            | 100   | 1500        |
| Elective   | 4         | 24         | 3      | 12            | 100   | 400         |
| Compulsory | 1         | 2          | 2      | 2             | 100   | 100         |
| Project    | 1         | 6          | 5      | 5             | 100   | 100         |
| Total      | <b>21</b> | <b>120</b> |        | <b>90</b>     |       | <b>2100</b> |

**ADVANCED FINANCIAL MANAGEMENT**

| Sem | Subject Code | Category | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
| I   |              | Main     | 6 hrs per week | 90 | 6 hrs per week | 90 | -         | 5      |

**COURSE OBJECTIVE:**

To enable the students to identify and evaluate the exposure of a company to financial risk and the techniques required to manage this risk. To analyze the strategic financial issues in acquisition or merger, including valuation of the target company.

**COURSE OUTCOMES:**

On successful completion of the course, the student will be able

| CO Number  | CO Statement   | Knowledge Level (K1 – K5) |
|------------|--|---------------------------|
| <b>CO1</b> | To understand and explore the system of financial planning in Business   | K2                        |
| <b>CO2</b> | To analyze alternative sources of finance and investment opportunities and their suitability in particular circumstances | K3                        |
| <b>CO3</b> | To evaluate the complex investment appraisal through cost of capital to the organization                                 | K3                        |
| <b>CO4</b> | To understand and analyze the risk and return of investment  | K4                        |
| <b>CO5</b> | To study the impact of working capital management on the strategic direction of the organization                         | K4                        |

*\*Knowledge Level: K1- Remember; K2- Understand; K3- Apply; K4 Analyse*

## MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | M   | S   |
| CO2 | S   | M   | S   | M   | M   | M   |
| CO3 | S   | M   | S   | S   | M   | M   |
| CO4 | M   | S   | M   | S   | M   | S   |
| CO5 | S   | S   | M   | M   | M   | S   |

S-Strong; M-Medium; L-Low

### Unit-I Financial Planning

**25 Hrs**

Definition of Financial Planning – Scope of Financial Planning – Objectives of Financial Planning – Factors Affecting Financial Planning – Essentials of sound Financial Plan- Limitations of Financial Plan – Capitalization – Theories of Capitalization – Over Capitalization and its causes – Remedies for over Capitalization.

### Unit-II Capital Structure/ Leverage

**20 Hrs**

Capital Structure- Meaning, Definition, Features, Factors Affecting Capital Structure, Theories of Capital Structure, Problems in Net Income Approach, Net Operating Income Approach.

Leverage- Meaning, Definition, Types of Leverage, Problem in Operating Leverage, Financial Leverage and Combined Leverage

### Unit-III Cost of Capital

**10 Hrs**

Cost of Capital- Meaning, Definition, and Features- Problems in Cost of Debt / Equity / Preference/ Retained Earning.

### Unit-IV Dividend Policy

**15Hrs**

Dividend Policy- Meaning, Definition, Types of Dividend, Factors Affecting Dividend Policy, Theories of Dividend Policy, Problem in Walters Model, Gordons Model, M.M Modular.

### Unit-V Working Capital Management

**20 Hrs**

Working Capital Management- Meaning, Definition, Sources of Working Capital Management, Factors Affecting Working Capital, Operating Cycles of Working Capital, Problems in Operating Cycle / Working Capital Requirement Method.

**DISTRIBUTION OF MARKS: THEORY 40% AND PROBLEM 60%**

## TEACHING METHODOLOGY

The course is covered by adopting a combination of lecture methods, class presentation by groups of students, self study sessions and PPT Presentations. Each student is required to do the back ground reading from the specified chapters of the prescribed book before coming to class.



**REFERENCE BOOKS**

| <b>S.No</b> | <b>Author</b>             | <b>Title</b>                     | <b>Publisher</b>                                       | <b>Year of Publications</b> |
|-------------|---------------------------|----------------------------------|--|-----------------------------|
| 1           | Prasanna Chandra          | Financial Management             | Tata McGraw Hill Publishing Company Limited, Noida, UP | 2010                        |
| 2           | S.N Maheswari             | Financial Management             | S.Chand& Sons Publisher, New Delhi                     | 2008                        |
| 3           | L.J.Gitman&Dr. M.Manickam | Principles of Managerial Finance | Pearson Education, New York                            | 2012                        |
| 4           | John H Hampton            | Financial Decision Making        | Prentice Hall of India Ltd                             | 2014                        |
| 5.          | M.Y.Khan and P.K.Jain     | Financial Management             | Tata McGraw Hill Publishing Company Limited.           | 2010                        |

**TEXT BOOKS**

| <b>S.No</b> | <b>Author</b>     | <b>Title</b>  | <b>Publisher</b>  | <b>Year of Publications</b> |
|-------------|-------------------|---|---|-----------------------------|
| 1           | I.M. Pandey       | Financial Management                                | Vikas Publication, New Delhi                            | 2015                        |
| 2           | Khan & Jain       | Financial Management                                | Tata McGraw Hill Publishing Company Limited, Noida, UP. | 2012                        |
| 3           | Dr. A. Murthy     | Financial Management                                | Vijay Nicole  | 2016                        |
| 4           | Dr. J. Srinivasan | Financial Management                                | Vijay Nicole  | 2016                        |
| 5.          | P.V.Ratnam        | Financial Management Theory, Problems and Solutions | Kitab Mahal   | 2014                        |

**WEB SOURCES:**

1. [books.google.co.in](http://books.google.co.in)
2. [www.coursera.org](http://www.coursera.org)
3. [open.umn.edu.in](http://open.umn.edu.in)

**SYLLABUS DESIGNER:**

1. Dr.R.Padmaja, Head and Associate Professor of Commerce.
2. Dr.G.Bhavani, Assistant Professor of Commerce.
3. Dr.K.Vinithi, Assistant Professor of Commerce.

## MARKETING MANAGEMENT

| Sem | Subject Code | Category | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
| I   |              | Main     | 6 hrs per week | 90 | 6 hrs per week | 90 | -         | 5      |

### COURSE OBJECTIVE:

Enable the student to understand the principles of marketing management, market segmentation product life cycle, pricing, branding etc.

### COURSE OUTCOMES:

On successful completion of the course, the student will be able

| CO  | CO Statement  | Knowledge Level (K1 – K4) |
|-----|---|---------------------------|
| CO1 | To understand the concept of marketing management and role of marketing management in Indian Economy. | K3                        |
| CO2 | To develop the strategy of buyer behavior and consumer satisfaction in marketing management.          | K3                        |
| CO3 | To understand and apply the concept of sales promotion and advertising in marketing management.       | K4                        |
| CO4 | To develop the emerging trends and issues in marketing management.                                    | K4                        |
| CO5 | To elucidate the recent trends in marketing   | K3                        |

*\*Knowledge Level: K1- Remember; K2- Understand; K3- Apply; K4 Analyse*

### MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | M   | M   |
| CO2 | M   | M   | M   | S   | M   | M   |
| CO3 | S   | M   | S   | S   | M   | M   |
| CO4 | M   | M   | M   | S   | M   | M   |
| CO5 | S   | M   | S   | S   | M   | M   |

S-Strong; M-Medium; L-Low

### Unit – I Introduction to Marketing Management

**20 Hrs**

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.

**Unit – II Buyer Behaviour and Consumer Satisfaction****15 Hrs**

Buyer Behavior- Consumer Behavior vs. Business Buying Behavior- Factors Affecting Consumer Behavior- Consumer Satisfaction – Rights of Consumers – Customer Expectations.

**Unit – III Sales Promotion****20 Hrs**

Sales Promotion- Tools of Promotion- Communication Process- Characteristics of Promotion- Merits- Demerits- Designing a Promotion Campaign- Promotion- Mix- Determinants- Promotion Tools- Advertising- Sales Promotion- Public Relations.

**Unit – IV Service Marketing****20 Hrs**

Introduction – Strategic approach in services marketing –Service marketing in E-Commerce and E-Marketing and Tele marketing Services – Service market research for global markets and rural markets – Innovations in services marketing – Ethical aspects in Service marketing.

**Unit- V Recent Trends in Marketing**

Green Marketing - Evolution of Green Marketing - Importance of green marketing - Benefits of Green Marketing- Green Marketing Mix - Strategies to Green Marketing; Rural Marketing an Overview - Evolution of Rural Marketing - Rural Marketing Mix - Rural Market Strategies with special reference to Segmentation , Targeting and Positioning - Corporate Social Responsibility in Rural Markets; Digital marketing – Channels of digital marketing- e tailing- Business modes of e tailing – differentiate between e commerce and e tailing – future of e-tailing market.

**TEACHING METHODOLOGY**

The course is covered by adopting a combination of lecture methods, class presentation by groups of students, Assignments, self study sessions and PPT Presentations. Each student is required to do the back ground reading from the specified chapters of the prescribed book before coming to class.

**TEXT BOOKS**

| S.No | Author                      | Title of the book    | Publication          | Year |
|------|-----------------------------|----------------------|----------------------|------|
| 1.   | Sontakki C.N                | Marketing Management | Kalyani Publishers   | 2009 |
| 2.   | Dr. RajanNayar              | Marketing Management | Margham publications | 2009 |
| 3.   | R.S.N. Pillai and Bagavathi | Modern Marketing     | S.Chand& Co          | 2010 |
| 4.   | Dr. K. Sundar               | Marketing            | Vijay Nicole         | 2011 |

**REFERENCE BOOKS**

| S.No | Author        | Title of the book                  | Publication                                   | Year |
|------|---------------|------------------------------------|---|------|
| 1.   | Philip Kotler | Marketing Management, 11th edition | PearsonEducation (Singapore) Pt Ltd, NewDelhi | 2003 |
| 2.   | Crrain field  | Marketing Management               | PalgraveMacmillan                             | 2003 |

|    |                                   |                                    |  |  |
|----|-----------------------------------|------------------------------------|--|--|
| 3. | V.L. Varshney and B. Bhattacharya | International Marketing Management |  |  |
|----|-----------------------------------|------------------------------------|--|--|

#### WEB SOURCE:

- <http://examupdates.in>
- <http://lecturenotes.in>
- [www.crectirupati.com](http://www.crectirupati.com)
- [www.gurukpo.com](http://www.gurukpo.com)

#### SYLLABUS DESIGNER:

1. Dr.R.Padmaja, Head and Associate Professor of Commerce.
2. Ms.D.Vijaya Nirmala, Head and Assistant Professor of Commerce.
3. Ms.J.Janani, Assistant Professor of Commerce.

#### ADVANCED BUSINESS STATISTICS

| Sem | Subject Code | Category | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
| I   |              | Main     | 6 hrs per week | 90 | 6 hrs per week | 90 | -         | 5      |

#### COURSE OBJECTIVE:

This course aims to impart the knowledge in the area of statistics which help students to apply the effective statistical tools for the purpose of conducting research and also helps them to read and evaluate journal articles.

#### COURSE OUTCOME:

On successful completion of the course, the student will be able

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To impart extensive knowledge about sampling techniques.  | K2                      |
| CO2       | To apply correlation and regression analysis in business activities.  | K3                      |
| CO3       | To acquire comprehensive knowledge about probability distribution.  | K2 & K3                 |
| CO4       | To acquire comprehensive knowledge with regard to chi-square analysis, hypothesis testing and also test the goodness of fit from the observed data. | K3 & K4                 |
| CO5       | To apply fisher distribution for analyzing the variance between the samples also test the equality of population variances.                         | K3 & K4                 |

*\*Knowledge Level: K1- Remember; K2- Understand; K3- Apply; K4 Analyse*

## MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | M   | S   | M   |
| CO2 | M   | S   | S   | M   | M   | M   |
| CO3 | S   | M   | M   | S   | S   | S   |
| CO4 | S   | S   | M   | S   | M   | S   |
| CO5 | M   | M   | S   | S   | M   | S   |

S-Strong; M-Medium; L-Low

### UNIT- I Introduction to Business Statistics and Sampling

**20 hrs**

Business Statistics - Meaning- characteristics – advantages and limitations - Sampling-meaning - methods of sampling-sampling errors-merits and limitations of sampling –testing the hypothesis-test of significance for attributes-test of significance for large samples-test of significance for small samples- students “t” distribution.

### UNIT- II Correlation and Regression Analysis

**20 hrs**

Correlation- partial correlation coefficient-multiple correlation- Karl Pearson correlation coefficient - Spearman Rank Correlation – Regression - Partial regression-multiple regression-regression equations.

### UNIT- III Probability Distribution

**15 hrs**

Probability distribution - theorem- addition- multiplication- applications of probability-binomial, Poisson and normal distribution- constants- Bayes theorem

### UNIT- IV Chi-Square Analysis

**20 hrs**

Chi-square distributions- characteristics and uses – applications- Test of goodness of fit-Test of independence- Test of homogeneity-Yates Correction.

### UNIT- V Fisher Distribution

**15 hrs**

Fisher distribution - Testing equality of population variances - Analysis of Variance –one - way and two - way classification.

## DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%

## TEACHING METHODOLOGY

The course is covered by adopting a combination of lecture methods, class presentation by groups of students, Assignments, self study sessions and PPT Presentations. Each student is required to do the back ground reading from the specified chapters of the prescribed book before coming to class.

**TEXT BOOKS:**

| S.No | Authors                     | Title                                       | Publishers                       | Year of Publications |
|------|-----------------------------|---|----------------------------------|----------------------|
| 1.   | S.P Gupta                   | Statistical Methods                         | Sultan Chand & sons              | 2017                 |
| 2.   | RSN Pillai&Bagavathi        | Statistics – Theory & Practice              | Sultan Chand & sons              | 2010                 |
| 3.   | D C Sancheti and V K Kapoor | Business statistics,                        | Sultan Chand and sons, New Delhi | 2015                 |
| 4.   | Dr D Joseph Anbarasu        | Business statistics and operations research | Lintech press Trichy             | 2017                 |

**REFERENCE BOOKS:**

| S.No | Authors                            | Title                                       | Publishers                                 | Year of Publications |
|------|------------------------------------|---|--|----------------------|
| 1.   | PA. Navanitham                     | Business Statistics and Operations Research | Jai Publishers                             | 2010                 |
| 2.   | J.K.sharma                         | Business Statistics                         | Pearson education India                    | 2015                 |
| 3.   | P.R Vital                          | Business Statistics and Operation Research  | Margham publications                       | 2016                 |
| 4.   | Richard I Levin and David S. Rubit | Statistics for management                   | 7 <sup>th</sup> Edition,Pearson education, | 2015                 |

**SYLLABUS DESIGNER:**

1. Mrs.P.Indhumathi, Assistant Professor of Commerce.

2. Dr.V.Sudha, Assistant Professor of Commerce.

**DYNAMICS OF BANKING**

| Sem | Subject Code | Category | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
| I   |              | Elective | 6 hrs per week | 90 | 6 hrs per week | 80 | 10 hrs    | 5      |

**COURSE OBJECTIVE:**

This course aims at acquaint and update the students with the significance of Banking and Financial Institutions

**COURSE OUTCOME:**

On successful completion of the course, the student will be able

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1 – K5)</b> |
|------------------|--|----------------------------------|
| <b>CO1</b>       | To understand and evolution of banking system in India.  | K2                               |
| <b>CO2</b>       | To acquire advanced knowledge about the development banks and the banking sector reforms in India. | K4                               |
| <b>CO3</b>       | To develop knowledge about the rural banking system in India.                                      | K3                               |
| <b>CO4</b>       | To understand the recent measures in NPA'S in Banking..  | K2                               |
| <b>CO5</b>       | To develop and apply E-Banking in modern business.   | K3                               |

*\*Knowledge Level: K1- Remember; K2- Understand; K3- Apply; K4 Analyse*

**MAPPING WITH PROGRAMME OUTCOMES**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | M   | M   |
| CO2 | S   | M   | M   | S   | M   | M   |
| CO3 | S   | M   | S   | S   | M   | M   |
| CO4 | S   | M   | M   | S   | M   | M   |
| CO5 | S   | M   | S   | S   | M   | M   |

S-Strong;

M-Medium;

L-Low

**Unit-I Introduction****15Hrs**

Introduction to Banking- Origin of Banks- Banking Structure in India- Role of Banks in Economic Developments- RBI- Features- Function- Commercial Banks- Types and Functions.

**Unit-II Development Banking****20 Hrs**

Banking Sector Reforms in India, Capital Adequacy Norms, Development Banking- Meaning- Types of Development Banks- IDBI, IFCI, SFC's, UTI, ICICI, SIDBI-EXIM Bank.

**Unit-III Rural Banking****15 Hrs**

Rural Banking- Structure- Co-operative Banks- Origin- Features- Three Tier Federal Co-operative Banks- State Co-operative Bank- District Central Co-operative Banks- Primary Agricultural Credit Societies- Primary- Co-operative Agriculture and Rural Development Banks- RRB'S- NABARD.

**Unit-IV Non-Performance Assets (NPA's)****15 Hrs**

Non-Performance Assets(NPA's)- Early Working Signals- Management of NPA's- Remedies Available- Recent Measures- Loan Recovery Tribunals.

**Unit-V E-Banking****15Hrs**

Meaning- Benefits- E-Banking Transaction- Electronic Delivery Channels- ECS, RTGS, NEFT, SWIFT- Difference between Traditional Banking Vs. E-Banking.

**Practical****10 hrs**

Online Banking Payment Transactions for Eg:- EB Bill, Phone Recharge, Gas Booking, Train Booking, Cinema Ticket Booking, RTGS, NEFT Transactions, SWIFT, ATM Money Transactions, Cheque Transfer in Online.

**TEACHING METHODOLOGY**

The course is covered by adopting a combination of lecture methods, class presentation by groups of students, self study sessions and PPT Presentations. Each student is required to do the back ground reading from the specified chapters of the prescribed book before coming to class.

**TEXT BOOKS:**

| S.No | Author                        | Title                           | Publisher                        | Year of Publications |
|------|-------------------------------|---------------------------------|----------------------------------|----------------------|
| 1    | SundharamVarshney, PN.        | Banking Theory and Practice     | Sultan Chand New Delhi           | 2015                 |
| 2    | Dr. S.N. Maheswari            | Banking Theory Law & Practice   | Kalyani Publications             | 2004                 |
| 3    | Vasant Desai                  | Principles of Bank Management   | Mumbai, Himalaya Publications    | 2010                 |
| 4    | B.Santhanam                   | Banking theory law and practice | Margham publication              | 2005                 |
| 5    | M.L. Tannan                   | Banking law and practice        | Wadhava Publishers               | 2005                 |
| 6    | S.Guruswamy                   | Banking Theory law and practice | Vijay Nicole imprint private ltd | 2017                 |
| 7    | E.Gordon and Dr. K. Natarajan | Banking Theory Law and Practice | Himalaya Publishing House        | 2015                 |



**REFERENCE BOOKS:**

| S.No | Author                        | Title   | Publisher                          | Year of Publication |
|------|-------------------------------|---|------------------------------------|---------------------|
| 1    | K.Subramanian                 | Banking Reforms in India,                           | TMH, New Delhi                     | 1997                |
| 2    | JosepbSinkey,                 | Commercial Bank Financial Bank Financial Management | Pearson Education (Prentice Hall). | 2013                |
| 3    | E.Gordon and Dr. K. Natarajan | Banking Theory Law and Practice                     | Himalaya Publishing House.         | 2018                |
| 4    | P.N.Varshney                  | Banking Theory Law and Practice                     | Sultan Chand & sons                | 2017                |
| 5    | Kandasami. K.P                | Banking Theory Law and Practice                     | Schand& Company                    | 2010                |
| 6    | Joseph Sinkey                 | Commercial Bank Financial Bank Financial Management | Pearson Education (Prentice Hall)  | 2015                |

**WEB SOURCES:**

- [www.wikipedia.com](http://www.wikipedia.com)
- [www.investopedia.com](http://www.investopedia.com)
- [www.cosmos-publicationbooks.com](http://www.cosmos-publicationbooks.com)

**SYLLABUS DESIGNER:**

1. Mrs. C.Sumitha, Head & Assistant Professor of Commerce (CA)
2. Mrs. S.Sasikala, Assistant Professor of Commerce.

**Strategic Management**

| Sem | Subject Code | Category | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
| I   |              | Elective | 6 hrs per week | 90 | 6 hrs per week | 90 | -         | 3      |

**Course Objective:**

This course will enable the students to understand the principles of strategy formulation, implementation and control in organizations

**Course outcome:**

| CO Number | Co Statement  | Knowledge Level(K1-K5) |
|-----------|---|------------------------|
| CO1       | To understand the Formulation of Strategic Management | K2                     |
| CO2       | To Analyze the Industrial Environment                 | K4                     |
| CO3       | To develop the Knowledge of Strategic Competitiveness | K3                     |

|     |   |    |
|-----|---|----|
|     | in Industries   |    |
| CO4 | To Applying the Alternatives Strategies in Management                                 | K3 |
| CO5 | To Devise Strategic approaches to Managing a Business successfully in global context. | K4 |

\*Knowledge level: K1 – Remember, K2 – Understand, K3 - Apply, K4 - Analyze

#### **Mapping with Programme outcomes:**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | M   | M   |
| CO2 | M   | M   | M   | S   | M   | M   |
| CO3 | S   | M   | S   | S   | M   | S   |
| CO4 | S   | M   | M   | S   | M   | S   |
| CO5 | S   | M   | S   | S   | M   | S   |

S - Strong, M - Medium, L - Low

#### **Unit - I Strategic Management Formulation**

**20hrs**

Strategic Formulation - Vision - Mission and purpose - Business Definition - Objectives - Goals - Stakeholders in Business - Corporate Social Responsibility - Ethical and Analyzing Company's Resources

#### **Unit - II Environment Analysis**

**15 hrs**

Evaluating a company's External Environment – Relevant components – Industry Analysis - Threats - Industry Competition - Sources of Competitions - Porter's Five Force Model

#### **Unit - III Strategic Competitiveness**

**20 hrs**

Business Level Strategy – Advantages - Hyper competitive conditions - Industry Life Cycle stages – Strategic Implications – Strategies for Competing in Emerging Industries - High Velocity Markets – Maturing Industries - Stagnant Industries - Fragmental Industries

#### **Unit - IV Strategic Alternative**

**20 hrs**

Corporate Level Alternatives - International Level Alternatives – Diversification - Vertical Integration - Unrelated Diversification - Unbundling & Outsourcing Strategies - Offensive – Defensive - Outsourcing Benefits - Growth - Merger & Acquisition Strategies - Strategic Alliances

#### **Unit - V Grand Strategies**

**15hrs**

New Business Model Strategies - Strategies for Internet Economy - Shaping Characteristics of E – Commerce Environment - Internet Strategies for Traditional Business - Key success factors in E - Commerce – Virtual Value Chain.

#### **Distribution of Marks: 100% Theory**

**TEACHING METHODOLOGY:**

The course is covered by adopting a combination of lecture methods, class presentation by groups of students, Assignments, Seminar by Students and uploading in YouTube, self study sessions and PPT Presentations. Each student is required to do the back ground reading from the specified chapters of the prescribed book before coming to class

**TEXT BOOKS**

| S.No. | Author                        | Title                                    | Publisher                        | Year of Publications |
|-------|-------------------------------|--|----------------------------------|----------------------|
| 1.    | Subba Rao                     | Business Policy and Strategic management | Himalaya Publishing Co.          | 2010                 |
| 2.    | Gerry Johnson & Kevan Scholes | Exploring Corporate Strategies           | Mc Graw Hill Education Pvt. Ltd. | 2009                 |
| 3.    | R. David                      | Strategic Management Concepts and Cases  | P.H.I Learning, New Delhi.       | 2010                 |

**REFERENCE BOOKS**

| S.No | Author                    | Title  | Publisher  | Year of Publication |
|------|---------------------------|--|--|---------------------|
| 1    | Wheelen                   | Concepts of Strategic Management and Business policy | 8 <sup>th</sup> Ed. Pearson Education, New Delhi | 2008                |
| 2.   | William Gluck & L R Jauch | Business Policy & Strategic Management               | McGraw-Hill 2001                                 | 2015                |

**Syllabus designer**

1. Dr. R. Padmaja, Head and Associate Professor of Commerce
2. Mrs. P. Elavarasi, Assistant Professor of Commerce

**HUMAN RESOURCE MANAGEMENT**

| Sem | Subject Code | Category | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
| II  |              | Main     | 6 hrs per week | 90 | 6 hrs per week | 90 | -         | 5      |

**COURSE OBJECTIVE:**

This course aims to inculcate the knowledge of Human Resource Management, Human Resources planning and various aspect of HRM. Focus is given to the new aspect of HRM called E-HRM.

**COURSE OUTCOMES:**

On successful completion of the course, the student will be able

| <b>CO NUMBER</b> | <b>CO STATEMENT</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| <b>CO1</b>       | To explore the basic concepts of human resource management and Development.  | K2                             |
| <b>CO2</b>       | To know formalize, design and evaluate various recruitment, selection and placement process in an organization.              | K3                             |
| <b>CO3</b>       | To develop extensive knowledge on training, performance appraisal, motivation and morale.                                    | K3                             |
| <b>CO4</b>       | To develop career planning and development strategies.   | K3                             |
| <b>CO5</b>       | To explore new concepts of HRM relating to stress management, human resource accounting & auditing and knowledge management. | K2                             |

*\*Knowledge Level: K1- Remember; K2- Understand; K3- Apply; K4 Analyse*

**MAPPING WITH PROGRAMME OUTCOMES:**

| <b>Programme/ Course outcomes</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|-----------------------------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b>                        | M          | M          | M          | S          | M          | M          |
| <b>CO2</b>                        | M          | M          | M          | S          | S          | M          |
| <b>CO3</b>                        | M          | S          | M          | S          | S          | S          |
| <b>CO4</b>                        | M          | M          | S          | S          | S          | M          |
| <b>CO5</b>                        | S          | M          | M          | S          | S          | S          |

**UNIT – I Introduction****20 hrs**

Human Resource Management (HRM) – Meaning – Definition –Objectives – Importance – History of HRM – Nature and Scope of HRM – Functions of HRM – Changing role of HR Manager – Human Resource Development (HRD) – HRD Mechanisms/subsystems – HRD in Indian Industry.

**UNIT - II Recruitment and Selection****20 hrs**

Job Analysis – Definition, Uses, Process, and Methods – Job Description and Job Specification - Human Resource Planning – Objectives & Importance of HRP - Process of HRP - Recruitment –Sources of Recruitment – Selection – Steps in the Selection Process – Selection Testing – Selection Interview – Placement and Induction – Transfer and Promotion.

**UNIT - III Training and Development****20 hrs**

Training - Features – Training Vs Development – Need for Training – Types of Training - Performance & Potential Appraisal – Employees Morale- Measures to improve Morale- Job Satisfaction –Motivation – Types - Theories

**UNIT - IV Career Planning and Career Development****15 hrs**

Career Planning – Career Stages – Succession Planning – Need and Objectives of Career Planning – Process – Career Development – Compensation Management – Wage and Salary Administration – Employee Welfare – Health and Safety

**UNIT - V Recent Trends in HRM****15 hrs**

Recent Trends in HRM – Stress Management - Human Resources Information System - Human Resources Accounting – HRM Research and Audit - Knowledge Management (Only Concepts)

**TEACHING METHODOLOGY:**

The course is covered by adopting a combination of lecture methods, class presentation by groups of students, Assignments, Seminar by Students and uploading in YouTube, self study sessions and PPT Presentations. Each student is required to do the back ground reading from the specified chapters of the prescribed book before coming to class.

**TEXT BOOKS:**

| S.No | Author                             | Title                                     | Publisher                  | Year of Publications |
|------|------------------------------------|---|----------------------------|----------------------|
| 1    | P. SubbaRao                        | Personnel and Human Resource Management   | Himalaya Publishing Houses | Latest Edition       |
| 2    | J.Jayasankar                       | Human Resource Management                 | Margham Publications       | 2018                 |
| 3    | Dr.J. Srinivasan and Dr. K. Sundar | Human Resource Management                 | Vijay Nicole               | 2017                 |
| 4.   | Aswathappa,                        | Human Resource and Personnel Management   | TataMcGraw Hill, NewDelhi  | 2015                 |
| 5.   | A.M. Sheikh                        | Human Resource Development and Management | S. Chand & Co, New Delhi.  | 2016                 |

**REFERENCE BOOKS:**

| S.No | Author         | Title                       | Publisher              | Year |
|------|----------------|-----------------------------|------------------------|------|
| 1    | Edwin Flippo   | Personnel Management        | Prentice Hall of India | 2002 |
| 2    | G.R.Basotia    | Human Resource Management   | Tamil Nadu Book House  | 2003 |
| 3    | Kausal Kumar   | Human Resource Management   | Tamil Nadu Book House  | 2003 |
| 4    | Shaun Tyson Ed | Strategic Prospects for HRM | New Delhi              | 2002 |

|   |                   |                                      |                         |      |
|---|-------------------|--------------------------------------|-------------------------|------|
| 5 | KandulaSrinivas R | Strategic Human Resource Development | Prentice Hall New Delhi | 2002 |
| 6 | Sharma            | Human Resource Management            | Tamil Nadu Book House   | 2003 |

#### WEB SOURCES:

- [www.humanresourceedu.org](http://www.humanresourceedu.org)
- [www.hrmthread.com](http://www.hrmthread.com)
- [www.careerride.com](http://www.careerride.com)

#### SYLLABUS DESIGNER:

1. Dr. R. Padmaja, Associate Professor and head of Commerce.
2. Dr.T.Bharathi, Assistant Professor of Commerce.

### ADVANCED ACCOUNTING

| Sem | Subject Code | Category | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
| II  |              | Main     | 6 hrs per week | 90 | 6 hrs per week | 90 | -         | 5      |

#### COURSE OBJECTIVE:

This course will enable the students to gain knowledge and understand the concepts and practices of company accounts in accordance with statutory requirements.

#### COURSE OUTCOMES:

On successful completion of the course, the student will be able

| CO  | CO Statement   | Knowledge Level (K1 – K5) |
|-----|--|---------------------------|
| CO1 | To have comprehensive understanding of issue of shares in companies. | K3                        |
| CO2 | To provide solid foundation about merger and acquisitions.           | K3                        |
| CO3 | To acquire extensive knowledge in Internal reconstruction.           | K4                        |
| CO4 | To apply and prepare the consolidated Balance Sheet.                 | K3                        |
| CO5 | To understand the legal provisions for banking companies account.    | K2                        |

*\*Knowledge Level: K1- Remember; K2- Understand; K3- Apply; K4 Analyse*

#### MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | S   | M   | M   |
| CO2 | S   | M   | M   | S   | M   | S   |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>C03</b> | S | S | M | S | M | S |
| <b>C04</b> | S | M | M | S | M | M |
| <b>C05</b> | S | S | M | S | S | S |

S-Strong; M-Medium; L-Low

### **Unit – I Amalgamation and Absorption**

**20 hrs**

Meaning Amalgamation and Absorption - Accounting problems relating to Amalgamation and Absorption –Purchase Consideration – Pooling of Interest Method – Purchase Method – Distinction between pooling and interest method and purchase method - Methods of accounting for Amalgamation and Absorption - Lump sum method, Net Asset method, Net Payment method – Absorption Net Asset method, Net Payment method, Intrinsic method – Inter Company Holdings.

### **Unit – II Alteration of Share Capital and Internal Reconstruction**

**20 hrs**

Alteration of Share Capital – Different kinds of alteration of share capital – Procedure for reducing share capital - Necessary Accounting Entries for reduction of share capital - Return of share capital – Surplus in capital reduction account – Capital reduction account and issue of share for arrears of preference dividend – Appreciation in value of asset and expenses of reconstruction.

### **Unit – III: Holding Company**

**15 hrs**

Holding Company- Subsidiary Company – capital Profit – Revenue Profits –Minority Interest – Cost of Control – Mutual Owings – Preparation of Balance sheet - Legal requirements in relation to presentation of accounts – Consolidated financial statements - Elimination of common transaction – unrealized profit – revaluation of assets and liabilities – Bonus shares – consolidated balance sheet.

### **Unit – IV Liquidation of Companies**

**15 hrs**

Meaning of Liquidation or Winding up – Order of Payments – Secured Creditors - Preferential Payments – Statement of affairs - Liquidators Final statement of account – Deficiency or Surplus – Participating preference share capital.

### **Unit – V Banking Company**

**20 hrs**

Accounts of Banking Companies – Legal provisions – Capital Adequacy Norms – Rebate on Bills discounted – Asset classification and Provisioning – Preparation of Final accounts.

### **DISTRIBUTION OF MARKS: 20% THEORY AND 80% PROBLEMS**

### **TEACHING METHODOLOGY:**

The course is covered by adopting a combination of lecture methods, class presentation by groups of students, self study sessions. Each student is required to do the back ground reading from the specified chapters of the prescribed book before coming to class.

**TEXT BOOKS**

| S.No | Author                                 | Title                       | Publisher                      | Year of Publications |
|------|--|-----------------------------|--------------------------------|----------------------|
| 1.   | M.C.Shukla and T.S.Grewal              | Advance accounts            | S.Chand& Co, New Delhi.        | 2016                 |
| 2.   | Anjan Bhattacharya & Subratha Mukerjee | Advanced Practical Accounts | S.Chand& Co, New Delhi.        | 2010                 |
| 3.   | T.S Reddy and A.Murthy                 | Corporate Accounting        | Margham Publications, Chennai. | 2016                 |

**REFERENCE BOOKS:**

| S.No | Author                                 | Title                       | Publisher                      | Year of Publications |
|------|--|-----------------------------|--------------------------------|----------------------|
| 1.   | Anjan Bhattacharya & Subratha Mukerjee | Advanced Practical Accounts | S.Chand& Co, New Delhi.        | 2010                 |
| 2.   | T.S Reddy and A.Murthy                 | Corporate Accounting        | Margham Publications, Chennai. | 2016                 |

**SYLLABUS DESIGNERS:**

1. Dr.R.Padmaja, Head and Associate Professor of Commerce.
2. Ms.J.Janani, Assistant Professor of Commerce.
3. Dr.K.Vinithi, Assistant Professor of Commerce.

**QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS**

| Sem | Subject Code | Category | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
| II  |              | Main     | 6 hrs per week | 90 | 6 hrs per week | 90 | -         | 5      |

**COURSE OBJECTIVE:**

This course aims to provide knowledge on how to apply the quantitative methods for taking effective business decisions.

**COURSE OUTCOMES:**

| CO Number | CO Statement   | Knowledge Level (K1 – K4) |
|-----------|--|---------------------------|
| CO1       | To interpret and analyze various quantitative techniques | K2                        |



|     |  |    |
|-----|--|----|
|     | used by industries.  |    |
| CO2 | To apply the inventory control concept in decision making.                             | K3 |
| CO3 | To apply quantitative techniques to technical problems in business management.         | K3 |
| CO4 | To critically evaluate the optimal job assignments for getting best possible solution. | K3 |
| CO5 | To grasp and inculcate queuing theory with effective models.                           | K4 |

*\*Knowledge Level: K1- Remember; K2- Understand; K3- Apply; K4 Analyse*

### **Mapping with Programme Outcomes**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | M   | M   |
| CO2 | M   | S   | S   | M   | M   | S   |
| CO3 | S   | S   | M   | M   | S   | M   |
| CO4 | M   | M   | S   | M   | M   | S   |
| CO5 | S   | M   | S   | S   | S   | M   |

S-Strong; M-Medium; L-Low

### **Unit – I Quantitative Techniques and Network Analysis**

Quantitative techniques – Meaning – Characteristics – Linear programming – Formulation method – Graphical method – Simplex Method – Maximization – Minimization (Big M Method) – Network analysis – Network diagram – PERT – CPM.

### **Unit – II Inventory control:**

Inventory models – Meaning – Definition – General concepts – Various cost concepts – Techniques of Inventory control – Determination of stock levels – EOQ – Formula method – Tabular method.

### **Unit – III Transportation**

Transportation model – Definition – Formulation and selection of Transportation methods – North west corner – Least cost method – Vogel's approximation method – Unbalanced transportation problem – Degeneracy in Transportation problem.

### **Unit – IV Assignment**

Assignment Model – Definition – Formulation and solution of Assignment models – Simplex and Hungarian method – Unbalanced Assignment Problem.

### **Unit –V Queuing Theory:**

Queuing theory – Meaning – Objectives – Elements/Structure of Queuing system – Limitations of Queuing theory – Application of Queuing models.

**DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%**

## TEACHING METHODOLOGY

The course is covered by adopting a combination of lecture methods, class presentation by groups of students, self study sessions. Each student is required to do the back ground reading from the specified chapters of the prescribed book before coming to class.

### TEXT BOOKS:

| S.No | Authors                   | Title                                       | Publishers                       | Year of Publications |
|------|---------------------------|---|----------------------------------|----------------------|
| 1    | P.R. Vittal and V. Malini | Operations Research                         | Margham Publications             | 2005                 |
| 2    | P.R. Vittal               | Quantitative Techniques                     | Margham publications             | 2007                 |
| 3    | J.K. Sharma               | Operations research                         | Sultan Chand and Sons            | 2010                 |
| 4    | Dr D Joseph anbarasu      | Business statistics and operations research | Lintec Press Trichy              | 2015                 |
| 5    | P.R.Gupta and Man Mohan   | Operation Research                          | Sultan Chand and sons, New Delhi | 2016                 |

### REFERENCE BOOKS:

| S.No | Authors        | Title                                       | Publishers             | Year of Publications |
|------|----------------|---|------------------------|----------------------|
| 1    | PA. Navanitham | Business Statistics and Operations Research | Jai Publishers         | 2010                 |
| 2    | P.R Vital      | Business statistics and operation research  | Margham publications   | 2016                 |
| 3.   | C.R.Kothari    | Quantitative Techniques                     | Vikas publishing house | 2015                 |
| 4.   | J.K. Sharma    | Mathematical Models in operation research   | TMH publishers         | 2014                 |

### SYLLABUS DESIGNER:

1. Mrs.P.Indhumathi, Assistant Professor of Commerce.
2. Dr.V.Sudha, Assistant Professor of Commerce.

## INSURANCE AND RISK MANAGEMENT

| Sem | Subject Code | Category    | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|-------------|----------------|----|----------------|----|-----------|--------|
| I   |              | Elective II | 6 hrs per week | 90 | 6 hrs per week | 90 | -         | 5      |

### COURSE OBJECTIVE:

On successful completion of the course, the student will be able

| CO Number | CO Statement  | Knowledge Level (K1 – K5) |
|-----------|---|---------------------------|
| CO1       | To acquire extensive knowledge on origin and growth of insurance. | K2                        |
| CO2       | To analyze the process of life insurance in day to day life.      | K3                        |
| CO3       | To explore the risk management strategies.                        | K2                        |
| CO4       | To analyze the process of fire and marine insurance in business   | K3                        |
| CO5       | To acquire knowledge on other miscellaneous insurance.            | K2                        |

*\*Knowledge Level: K1- Remember; K2- Understand; K3- Apply; K4 Analyse*

### MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | M   | M   | S   |
| CO2 | M   | S   | M   | S   | S   | S   |
| CO3 | M   | S   | M   | M   | M   | S   |
| CO4 | M   | S   | M   | S   | S   | M   |
| CO5 | M   | S   | M   | M   | M   | M   |

S-Strong; M-Medium; L-Low

### Unit-I Origin, Growth and Trend of Insurance

**20 hrs**

Profile of Insurance Business in India - Reforms in Insurance Sector- Current Trends in Insurance Sector- Role of Insurance in the Development of Commerce and Industry- IRDA- Objectives of IRDA- Important Provisions Relating to Powers- Functions of IRDA- Duties- Functions of Insurance Agent Under IRDA- functions of development office under IRDA.

### Unit-II Life Insurance

**15 hrs**

Principles of Life Insurance- Policy Condition Assignment- Nomination- Lapse and Policies - Surrender Value- Premium Fixation Methods- Claim Settlement.

### Unit-III Risk Management

**20 hrs**

Risk- Types- Principles of Risk Management - Objective - Costs of Risk- Methods of Risk Management - Identification of Risk Measurement and Control.

**Unit-IV Five and Marine Insurance****20 hrs**

Five Insurance- Principles- Types of Fire Policies - policy Condition- Rate Fixation Method- Marine Insurance- Principle- Policies - Marine Clauses- Premium Fixation- Marine Losses - Refund of Premium.

**Unit-V Miscellaneous and Insurance****15 hrs**

Burglary Insurance- Medi Claim- Motor Vehicle Insurance- Crop Insurance - Boiler Insurance- Shop Keepers Insurance.

**DISTRIBUTION OF MARKS: THEORY 100%****TEACHING METHODOLOGY:**

The course is covered by adopting a combination of lecture methods, class presentation by groups of students, Assignments, Seminar by Students and uploading in YouTube, self study sessions and PPT Presentations. Each student is required to do the back ground reading from the specified chapters of the prescribed book before coming to class

**REFERENCE BOOKS**

| S.No | Author          | Title                                       | Publisher                   | Year of Publications |
|------|-----------------|---|-----------------------------|----------------------|
| 1.   | Dr. Sunil Kumar | Insurance and Risk Management               | Galgotia Publishing company | 2016                 |
| 2.   | Anand Gangly    | Insurance Management                        | New age International       | 2014                 |
| 3.   | George E. Rejda | Principles of risk management and insurance | Pearson                     | 2016                 |

**TEXT BOOKS**

| S.No | Author            | Title                         | Publisher                          | Year of Publications |
|------|-------------------|-------------------------------|------------------------------------|----------------------|
| 1    | Arthur C Williams | Risk Management and Insurance | 8 <sup>th</sup> Ed, McGraw Hill Co | 2012                 |

**SYLLABUS DESIGNER:**

1. Dr.R.Padmaja, Head and Associate Professor of Commerce.
2. Dr.A.SudarVizhi, Assistant Professor of Commerce.
3. Mrs. J. Anbazhagi, Assistant Professor of Commerce.

## TOTAL QUALITY MANAGEMENT

| Sem | Subject Code | Category    | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|-------------|----------------|----|----------------|----|-----------|--------|
| I   |              | Elective II | 6 hrs per week | 90 | 6 hrs per week | 90 | -         | 5      |

### Course Objectives:

To enable the student to understand the various concepts and tools of total quality management.

| CO Number | CO Statement   | Knowledge Level (K1 – K4) |
|-----------|--|---------------------------|
| CO1       | To understand the concept of total quality and statistical quality control and inspection plans. | K3                        |
| CO2       | To understand the humanistic aspects of TQM.   | K4                        |
| CO3       | To understand and apply the concept of TQM using tools.  | K4                        |
| CO4       | To develop the process design and customer retention.  | K4                        |
| CO5       | To elucidate the aspects of total quality standards.   | K3                        |

*\*Knowledge Level: K1- Remember; K2- Understand; K3- Apply; K4 Analyse*

### Mapping with Programme Outcomes

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | M   | M   |
| CO2 | M   | M   | M   | S   | M   | M   |
| CO3 | S   | M   | S   | S   | M   | M   |
| CO4 | M   | M   | M   | S   | M   | M   |
| CO5 | S   | M   | S   | S   | M   | M   |

S-Strong; M-Medium; L-Low

### Unit – I Basic concepts and origin of TQM

**20 Hrs**

Basic concept of total quality (TQ), evolution of total quality mgt., cost of quality, Scope of TQM, Dimensions of Quality. Statistical Quality Control and Inspection – Concept of SQC – Acceptance sampling and inspection plans – Statistical Process Control – Prevention through process improvement.

### Unit – II Process Capability

**20 Hrs**

Process capability studies, humanistic aspects of TQM, management of quality circle and Z.D. Programmes, Kaizen.

### Unit – III Tools of TQM

**15 Hrs**

Q – 7 tools, taguchi loss function, functional linkage of quality with reliability and maintainability, failure analysis, just – in – time system, JIT manufacturing system, JIT Pull system, use of kanban, JIT purchase.

**Unit – IV Total Productive Maintenance****10 Hrs**

Optimum maintenance decisions, TPM, Process design and the work process. Management support mechanisms, Customer Retention.

**Unit –V Six Sigma****10 Hrs**

ISO – 9000 standards, quality audits, TQM tools, marketing aspects of total quality, total quality of services, Total Quality - Safety – Six sigma – Quality Standard .

**Distribution of Marks: 100% Theory**

**TEACHING METHODOLOGY:**

The course is covered by adopting a combination of lecture methods, class presentation by groups of students, Assignments, Seminar by Students and uploading in YouTube, self study sessions and PPT Presentations. Each student is required to do the back ground reading from the specified chapters of the prescribed book before coming to class

**Text BOOKS:**

| S.No | Author                         | Title of the book        | Publication                        | Year |
|------|--------------------------------|--------------------------|------------------------------------|------|
| 1.   | Shridhara Bhat. K.             | Total quality Management | Himalaya Publishing House, Mumbai. | 2004 |
| 2.   | Pike, John and Barnes, Richard | TQM in action            | Chapman & Hill, London             | 1990 |

**Reference books**

| S.No | Author                        | Title of the book                        | Publication                 | Year |
|------|-------------------------------|--|-----------------------------|------|
| 1.   | Spenley Paul                  | World Class Performance through TQ       | Chapman & Hall, London      | 1992 |
| 2.   | Suresh Dalela & Saurabh       | A Manual for Total Quality Management    | S.Chand& Company Ltd        | 2004 |
| 3.   | Gopal K. Kanji and Mike Asher | 100 methods for total quality management | Sage Publication, New Delhi | 1996 |

**SYLLABUS DESIGNERS**

1. Dr.R.Padmaja, Head and Associate Professor of Commerce.
2. Mrs. P. Indhumathi, Assistant Professor of Commerce.

## PERSONALITY DEVELOPMENT

| Sem | Subject code | Category          | Lecture | Theory | Practical | Credit |
|-----|--------------|-------------------|---------|--------|-----------|--------|
| I   | -            | Self Study Course | -       | -      | -         | 2      |

### Unit-I: Introduction to Personality

Definition of Personality – concepts and components of Personality – Determinants of Personality – biological, psychological and socio-cultural factors – Misconceptions and clarifications – Need for Personality Development.

### Unit-II: Self Analysis

Self Analysis through SWOT Analysis - Johari Window - Visions and Lifestyles - Goal setting - Perseverance – Overcoming failure - Who Am I- Building up self confidence- Self Esteem – Importance of self esteem - Steps to improve self esteem.

### Unit-III: Memory and Study Skills

Short term memory and long term memory – The importance of memory – causes of forgetting – Steps for memory improvement – Tips and techniques of memory improvement - Lack of self-confidence – Competition – Negative thoughts – Analyzing the situation realistically.

### Unit-IV: Power of Positive Thinking

Feed your mind – Meaning of positive attitude – Benefits of positive attitude – Developing a positive attitude and thinking – Positive thinking and self talk – Positive affirmations

### Unit-V: Presentation and Communication Skill

Learning to prepare for a presentation- conducting presentations in a smooth and self assured manner – Building oratory skills – Communication Skill - Verbal and non-verbal communication – Difference between verbal and non-verbal communication - - Art of Preparing Correct and adequate CV

### ASSESSMENT:

- Self introduction
- Small presentation
- Corporate walk
- Preparing CV

### REFERENCE BOOKS:

- Soft Skills 2015, Career Development Centre, Green Pearl Publications

### SYLLABUS DESIGNERS

1. Dr.R.Padmaja, Head and Associate Professor of Commerce.
2. Dr. K. Vinithi, Assistant Professor of Commerce.

## **DEPARTMENT OF COMMERCE**

### **B.COM (COMPUTER APPLICATIONS)**

#### **PROGRAMME EDUCATIONAL OBJECTIVES (PEO)**

**PEO 1:** To develop professional skills, values and knowledge to accept the challenges in industry and academics.

**PEO 2:** To excel in contemporary knowledge of business through information.

#### **PROGRAMME OUTCOMES (PO)**

**PO1:** To provide ample exposure in the field of commerce, accountancy, management through computer application.

**PO2:** To develop the extensive knowledge in the field of computer application.

**PO3:** To gear up with updated knowledge in implementing business practices.

**PO4:** To acquire skills like effective communication, decision-making and problem solving in day to day business activities.

**PO5:** To gain comprehensive knowledge in finance, accounting and taxation

**PO6:** To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity.

## **DEPARTMENT OF COMMERCE(COMPUTER APPLICATION)**

### **B.COM (CA) CBCS PATTERN**

#### **THE COURSE OF STUDY AND THE SCHEME OF EXAMINATION**

| S.NO         | PART | STUDY COMPONENTS | INS. HRS./WEEK | CREDIT | TITLE OF THE PAPER               | CIA | UNIV EXAM | TOTAL |
|--------------|------|------------------|----------------|--------|----------------------------------|-----|-----------|-------|
|              |      | COURSE TITLE     |                |        |                                  |     |           |       |
| SEMESTER – I |      |                  |                |        |                                  |     |           |       |
| 1            | I    | Language –I      | 6              | 4      | Tamil –I /other language         | 25  | 75        | 100   |
| 2            | II   | English –I       | 6              | 4      | English -I                       | 25  | 75        | 100   |
| 3            | III  | Core Paper -I    | 5              | 4      | Financial Accounting -I          | 25  | 75        | 100   |
| 4            | III  | Core Paper –II   | 5              | 4      | Basics of Information Technology | 25  | 75        | 100   |
| 5            | III  | Allied - I       | 6              | 5      | Indian Economy- I                | 25  | 75        | 100   |
| 6            | IV   | EVS              | 2              | 2      | EVS                              | 25  | 75        | 100   |



|                      |     |                        |           |           |  |            |            |            |
|----------------------|-----|------------------------|-----------|-----------|--|------------|------------|------------|
|                      |     |                        | <b>30</b> | <b>23</b> |  | <b>150</b> | <b>450</b> | <b>600</b> |
| <b>SEMESTER –II</b>  |     |                        |           |           |  |            |            |            |
| 1                    | I   | Language –II           | 6         | 4         | Tamil –II /other language                      | 25         | 75         | 100        |
| 2                    | II  | English –II            | 4         | 4         | English -II                                    | 25         | 75         | 100        |
| 3                    | III | Core Paper –III        | 5         | 4         | Financial Accounting -II                       | 25         | 75         | 100        |
| 4                    | III | Core Paper-IV          | 5         | 4         | Internet and its Applications                  | 25         | 75         | 100        |
| 5                    | III | Allied Paper – II      | 6         | 5         | Indian Economy -II                             | 25         | 75         | 100        |
| 6                    | IV  | Value Education        | 2         | 2         | Value Education                                | -          | 50         | 50         |
| 7                    | IV  | Soft Skill             | 2         | 1         | Soft Skills                                    | -          | 50         | 50         |
|                      |     |                        | <b>30</b> | <b>24</b> |  | <b>125</b> | <b>475</b> | <b>600</b> |
| <b>SEMESTER III</b>  |     |                        |           |           |  |            |            |            |
| 1                    | I   | Core Paper –V          | 6         | 5         | Corporate Accounting –I                        | 25         | 75         | 100        |
| 2                    | II  | Core Paper –VI         | 5         | 4         | Legal Aspects of Business                      | 25         | 75         | 100        |
| 3                    | III | Core Paper – VII       | 5         | 4         | Modern Banking                                 | 25         | 75         | 100        |
| 4                    | III | Core Practical         | 3         | 3         | Internet and office Automation Lab             | 40         | 60         | 100        |
| 5                    | III | Allied Paper – III     | 6         | 5         | Business Statistics and Operation Research - I | 25         | 75         | 100        |
| 6                    | IV  | Skill Based Subject –I | 3         | 2         | Entrepreneurial Development                    | -          | 50         | 50         |
| 7                    | IV  | Non Major –I           | 2         | 2         | Elements of accountancy                        | -          | 50         | 50         |
|                      |     |                        | <b>30</b> | <b>25</b> |  | <b>140</b> | <b>460</b> | <b>600</b> |
| <b>SEMESTER – IV</b> |     |                        |           |           |  |            |            |            |
| 1                    | III | Core Paper – VIII      | 6         | 5         | Corporate Accounting –II                       | 25         | 75         | 100        |
| 2                    | III | Core Paper –IX         | 5         | 4         | Business Management                            | 25         | 75         | 100        |
| 3                    | III | Core Paper –X          | 5         | 4         | Data Base Management System                    | 25         | 75         | 100        |
| 4                    | III | Core Practical         | 3         | 3         | RDBMS lab                                      | 40         | 60         | 100        |
| 5                    | III | Allied Paper – IV      | 6         | 5         | Business Statistics and Operation              | 25         | 75         | 100        |

|                      |     |                          |           |           |   |            |            |            |
|----------------------|-----|--------------------------|-----------|-----------|---|------------|------------|------------|
|                      |     |                          |           |           | Research - II   |            |            |            |
| 6                    | IV  | Skill Based Subject –II  | 3         | 2         | Business communication(with practical using language lab)   | -          | 50         | 50         |
| 7                    | IV  | Non Major –II            | 2         | 2         | Fundamentals of Commerce  | -          | 50         | 50         |
|                      |     |                          | <b>30</b> | <b>25</b> |   | <b>140</b> | <b>460</b> | <b>600</b> |
| <b>SEMESTER – V</b>  |     |                          |           |           |   |            |            |            |
| 1                    | III | Core Paper – XI          | 6         | 4         | Cost Accounting - I   | 25         | 75         | 100        |
| 3                    | III | Core Paper – XII         | 6         | 4         | Management Accounting   | 25         | 75         | 100        |
| 4                    | III | Core Paper – XIII        | 5         | 4         | Multi Media   | 25         | 75         | 100        |
| 5                    | III | Elective –I              | 5         | 3         | (To choose one out of 2)<br>1. Income Tax Law and Practice –I<br>2. Logistics and Supply Chain Management | 25         | 75         | 100        |
|                      | III | Elective-II              | 5         | 3         | (To choose one out of 2)<br>1.Modern Marketing<br>2. Elements of Insurance                                | 25         | 75         | 100        |
| 6                    | IV  | Skill Based Subject –III | 3         | 2         | Human Resource Management   | -          | 50         | 50         |
|                      |     |                          | <b>30</b> | <b>20</b> |   | <b>125</b> | <b>425</b> | <b>550</b> |
| <b>SEMESTER – VI</b> |     |                          |           |           |   |            |            |            |
| 1                    | III | Core paper – XIV         | 6         | 5         | Cost accounting - II  | 25         | 75         | 100        |
| 2                    | III | Core paper – XV          | 6         | 4         | Programming in Java   | 25         | 75         | 100        |
| 3                    | III | Core practical           | 3         | 3         | Java Programming and Web Technology   | 40         | 60         | 100        |
| 4                    | III | Elective –III            | 6         | 3         | (To choose one out of 2)<br>1. Income tax law and practice-II<br>2. E-Commerce                            | 25         | 75         | 100        |

|   |     |                         |            |            |  |            |            |             |
|---|-----|-------------------------|------------|------------|--|------------|------------|-------------|
| 5 | III | Elective –IV            | 6          | 3          | Choose any 1 from the options:<br>(a)Web Technology<br>(b) Operating System<br>(c) Object Oriented Analysis and Design | 25         | 75         | 100         |
| 6 | IV  | Skill Based Subject –IV | 3          | 2          | Goods and Services Tax   | -          | 50         | 50          |
| 7 | V   | Extension Activities    | -          | 3          | Extension Activities   | 100        | 0          | 100         |
|   |     |                         | <b>30</b>  | <b>23</b>  |  | <b>240</b> | <b>410</b> | <b>650</b>  |
|   |     | <b>TOTAL</b>            | <b>180</b> | <b>140</b> |  |            |            | <b>3600</b> |

**Financial Accounting - I**

| SEM | Subject Code | Category | Lecture        |    | Tutorial       |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
|     |              |          |                |    |                |    |           |        |
| I   |              | Core 1   | 5 Hrs per Week | 75 | 5 Hrs per Week | 75 | -----     | 4      |

## CONSOLIDATED STATEMENT

| Part            | Subject                  | Pape<br>rs | Hours | Credit | Total<br>Credits | Marks | Total<br>Marks |
|-----------------|--------------------------|------------|-------|--------|------------------|-------|----------------|
| <b>Part-I</b>   | Languages                | 2          | 12    | 4      | 8                | 100   | 200            |
| <b>Part-II</b>  | English                  | 2          | 10    | 4      | 8                | 100   | 200            |
| <b>Part-III</b> | Allied(odd Sem)          | 2          | 12    | 5      | 10               | 100   | 200            |
|                 | Allied (even sem)        | 2          | 12    | 5      | 10               | 100   | 200            |
|                 | Elective                 | 4          | 17    | 3      | 12               | 100   | 300            |
|                 | Core paper               | 15         | 89    | 4-5    | 63               | 100   | 1600           |
|                 | Core practical           | 3          | 9     | 3      | 9                | 100   | 300            |
| <b>Part-IV</b>  | Environmental<br>science | 1          | 2     | 2      | 2                | 100   | 100            |
|                 | Soft Skills              | 1          | 2     | 1      | 1                | 50    | 50             |
|                 | Value Education          | 1          | 2     | 2      | 2                | 50    | 50             |
|                 | Non major                | 2          | 4     | 2      | 4                | 50    | 100            |
|                 | Skill-Based              | 4          | 9     | 2      | 8                | 50    | 200            |
| <b>Part-V</b>   | Extension<br>Activities  | 1          | -     | 3      | 3                | 100   | 100            |
|                 | Total                    | 40         | 180   |        | 140              |       | 3600           |

## COURSE OBJECTIVE

- The main objective of this course is to develop conceptual understanding of the fundamentals of Financial Accounting systems
- To enable the students to take up higher studies like CA, ICWA and ACS with ease and confidence.

## COURSE OUTCOMES

On the successful completion of the course, the students will be able

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| <b>CO1</b>       | To understand the basic Principles and practical Applications of Accounting                  | K1                             |
| <b>CO2</b>       | To have practical knowledge in the preparation of Double Entry System                        | K2                             |
| <b>CO3</b>       | To draft the Final Accounts as per the Accounting standards                                  | K3                             |
| <b>CO4</b>       | To acquire practical knowledge in Calculation of fire insurance and depreciation calculation | K2                             |
| <b>CO5</b>       | To gain expertise in preparation of Single Entry System                                      | K3                             |

*Knowledge Level : K1- Remember; K2 – Understand; K3 – Apply; K4 - Analyze*

### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>Cos</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | M          | M          | S          | M          |
| <b>CO2</b> | S          | S          | M          | M          | M          | S          |
| <b>CO3</b> | M          | S          | M          | M          | M          | S          |
| <b>CO4</b> | S          | M          | M          | S          | M          | M          |
| <b>CO5</b> | M          | S          | S          | M          | M          | M          |

S- Strong    M – Medium    L – Low

### **UNIT – I Introduction to Accounting**

**10 hrs**

Meaning of Accounting – Objectives of Accounting – Advantages and Disadvantages of Accounting – Groups Interested in Accounting Information – Basic Accounting Concepts and Conventions.

### **UNIT – II Double Entry System of Accounts**

**15 hrs**

Double Entry System – Concepts – Meaning – Advantages and Disadvantages - Journal – Ledger – Trial Balance – Rectification of Errors (Simple problems only)

### **UNIT – III Final Accounts**

**15hrs**

Introduction – Objectives of preparing of final Accounts – Trading Account – Profit and Loss Account – Balance Sheet – Various Adjustments, Classifications of Assets and Liabilities – for sole proprietorship concern only.

**UNIT – IV Depreciation Accounting and Fire Insurance Claims****20 hrs**

Concept of depreciation – Causes – Objectives – Need for providing Depreciation – Methods of providing depreciation – Straight line Method – Diminishing Balance Method (Change in method of Depreciation excluded) – Fire Insurance claims – Computation of claim to be lodged for loss of stock – Gross Profit Ratio – Average Clause – Average due date.

**UNIT – V Single Entry System of Accounting****15 Hrs**

Meaning – Definition – Features – Advantages – Limitations of Single Entry System – Differences between Double Entry System and Single Entry System. Methods of Calculation of Profit – Statement of Affairs method and Conversion Method – Difference

**DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%**

**TEACHING METHODOLOGY:** Class Room Teaching, Assignments, Discussions, Home Test, PPT Presentations

**TEXT BOOKS:**

| S.No | Authors              | Title of the Book    | Publication         | Year of Publication |
|------|----------------------|----------------------|---------------------|---------------------|
| 1    | T.S.Reddy & A.Murthy | Financial Accounting | Margham Publication | 2018                |

**REFERENCE BOOKS :**

| S.No | Authors                                      | Title of the Book    | Publication                                     | Year of Publications |
|------|--|----------------------|---|----------------------|
| 1    | S.P.Jain& K.L.Narang                         | Advanced Accountancy | Kalyani Publications, New Delhi,                | 2016                 |
| 2    | R.L.Gupta                                    | Advanced Accounting  | Sultan Chand & Co.                              | 2015                 |
| 3    | M.C.Shukla & T.S.Grewal                      | Financial Accounting | Sultan Chand & Co.                              | 2014                 |
| 4    | K.Murugadoss, M.Jaya, V.Charulatha, D.Baskar | Financial Accounting | Vijay Nicole Imprints Private Limited, Chennai. | 2016                 |

**SYLLABUS DESIGNER:**

1. Dr.A .SudarVizhi, Assistant Professor of Commerce.
2. Mrs.S.Sasikala, Assistant Professor of Commerce.

## FINANCIAL ACCOUNTING – II

| SEM | Subject Code | Category | Lecture        |    | Tutorial       |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
| II  |              | Core 3   | 5 Hrs Per Week | 75 | 5 Hrs Per Week | 75 | -         | 4      |

### COURSE OBJECTIVES

- The objective of this paper is to help the students to acquire conceptual knowledge of financial accounting.
- To develop the skills for recording the various kinds of Business Transactions.

### COURSE OUTCOMES

On the successful completion of the course, the students will be able

| CO Number  | Co Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To learn the basic concepts in preparing the branch accounts  | K2                      |
| <b>CO2</b> | To Familiarize the preparation of Department Accounts   | K2                      |
| <b>CO3</b> | To learn the procedure for calculation of Interest in Hire Purchase System  | K1                      |
| <b>CO4</b> | To calculate the new Profit Sharing Ratio and Sacrificing Ratio while admitting a partners at the time Admission and Retirement | K2                      |
| <b>CO5</b> | To acquire knowledge on settlements of partners at the time of Dissolution of a partnership                                     | K2                      |

*Knowledge Level : K1- Remember; K2 – Understand; K3 – Apply; K4 - Analyze*

### MAPPING WITH PROGRAMME OUTCOMES

| Cos        | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | M   | M   | M   |
| <b>CO2</b> | S   | S   | M   | M   | S   |
| <b>CO3</b> | M   | S   | M   | M   | S   |
| <b>CO4</b> | S   | M   | M   | S   | M   |
| <b>CO5</b> | M   | S   | S   | M   | M   |

S- Strong    M – Medium    L – Low

**UNIT – I Branch Accounting****10 Hrs**

Branch Accounts – Objectives of Branch Accounts – Types of Branches – Debtors system [at cost price and invoice price] – Stock and Debtors system – Incorporation of Branch Trial Balance – [Foreign Branch Excluded] [Only Simple Problems].

**UNIT – II Department Accounting****10 hrs**

Meaning – Objectives – Need – Distinction between departments and Branches – Advantages – Apportionment of Indirect Expenses – Inter departmental Transfers at cost price and selling price – Preparation of departmental Trading, Profit, Loss Account and Balance Sheet. (Simple problems)

**UNIT – III Hire Purchase System****15 hrs**

Meaning and features of Hire Purchase System – Important Terms – Calculation of Interest – Books of Hire Purchases and Books of Hire Vendor – Default and Repossession (Simple problems)

**UNIT – IV Partnership Accounts – I****20 Hrs**

Admission of Partner – Calculation of New Profit Ratio – Sacrificing Ratio – Revaluation of Assets and Liabilities – Calculation of Goodwill – Treatment of Goodwill – Retirement of a partner – Death of a partner.

**UNIT – V Partnership Accounts – II****20 Hrs**

Meaning of Dissolution – Modes of Dissolution – Settlement of Accounts – Accounting Treatment – Insolvency of a partner – Insolvency of all partners – Garner Vs Murray piecemeal Distribution – Proportionate capital method – Maximum Loss Method.

**DISTRIBUTION OF MARKS : THEORY 20% AND PROBLEMS 80%**

**TEACHING METHODOLOGY:** Class Room Teaching, Assignments, Discussions, Home Test, PPT Presentations.

**TEXT BOOKS :**

| S.No | Name of the Book     | Authors              | Publication         | Year of Publication |
|------|----------------------|----------------------|---------------------|---------------------|
| 1    | Financial Accounting | T.S.Reddy & A.Murthy | Margham Publication | 2018                |



**REFERENCE BOOKS :**

| S.No | Name of the Book     | Authors                                      | Publication                                     | Year of Publication |
|------|----------------------|--|---|---------------------|
| 1    | Advanced Accountancy | S.P.Jain & K.L.Narang                        | Kalyani Publications, New Delhi,                | 2016                |
| 2    | Advanced Accounting  | R.L.Gupta                                    | Sultan Chand & Co.                              | 2015                |
| 3    | Financial Accounting | M.C.Shukla and T.S.Grewal                    | Sultan Chand & Co.                              | 2017                |
| 4    | Financial Accounting | K.Murugadoss, M.Jaya, V.Charulatha, D.Baskar | Vijay Nicole Imprints Private Limited, Chennai. | 2019                |

**SYLLABUS DESIGNER:**

1. Dr.A .SudarVizhi, Assistant Professor of Commerce.
2. Mrs.S.Sasikala, Assistant Professor of Commerce.

**DEPARTMENT OF COMMERCE UG-(ALLIED)**  
**DEPARTMENT OF COMPUTER APPLICATIONS**

**PROGRAMME EDUCATIONAL OBJECTIVES**

**PEO1.** Graduates will have skills and knowledge to excel in their professional career in Computer Applications and its related disciplines.

**PEO2.** Graduates will be ethically and socially responsible solution providers in Computer Applications and successfully pursue higher education in reputed institutions.

**PROGRAMMES OUTCOME**

**PO1 : Problem Analysis:**To identify, formulate and analyse complex Computer Science and Applications Problems in the areas of hardware, software, theoretical Computer Science to reach significant conclusions by applying Mathematics, Natural science, Accounts, Computer Science and applications principles.

**PO2: Design & Development of Solutions:**To design and build a system, component, process or a program for complex problems by factoring in all the requirements and various design tradeoffs, with appropriate consideration for the public health and safety, cultural, corporate social and environmental factors.

**PO3. Modern Tool Usage:**To create, select and apply models and techniques in designing, developing and testing a computing system or its component.

**PO4 Ethics:** TO apply Business and professional ethics and cyber regulations, responsibilities and pledge to the norms of professional computing practice.

**PO5. Environment and Sustainability:** To demonstrate the knowledge of sustainable development of computing systems/products/solutions/with an understanding of the impact of these solutions on the Society and Environment.

**PO6. Life-long Learning:** To spot the need for and engage in lifelong learning to cope up with the rapidly evolving disciplines of Computer Science and applications domains.

#### **ACCOUNTING FOR BUSINESS – I (Allied) B.C.A**

| <b>Sem</b> | <b>Subject Code</b> | <b>Category</b> | <b>Lecture</b> |    | <b>Theory</b>  |    | <b>Practical</b> | <b>Credit</b> |
|------------|---------------------|-----------------|----------------|----|----------------|----|------------------|---------------|
| I          |                     | Allied          | 6 hrs per week | 90 | 6 hrs per week | 90 | -                | 4             |

#### **COURSE OBJECTIVES:**

- The objective of this paper is to help the students to acquire conceptual knowledge of accounting.

#### **COURSE OUTCOMES:**

On the successful completion of the course, the student will be able

| <b>CO NUMBER</b> | <b>CO STATEMENT</b>   | <b>KNOWLEDGE LEVEL<br/>(K1-K5)</b> |
|------------------|---|------------------------------------|
| <b>CO1</b>       | To introduce the basic concepts and conventions to the students, this would help in development of accounting knowledge.        | K1                                 |
| <b>CO2</b>       | To understand the concept of Double entry system this helps in preparation of various books of accounts.                        | K2                                 |
| <b>CO3</b>       | To develop the capability of students to prepare the Final Accounts of a Small Business Concern.                                | K3                                 |
| <b>CO4</b>       | To introduce the concept of Single entry system of Accounting which helps them to prepare the accounts from incomplete records. | K3                                 |
| <b>CO5</b>       | To enhance the Accounting Knowledge by introducing the practical uses of Average Due Date and Bank Reconciliation Statement.    | K2                                 |

Knowledge Level: K1 - Remember; K2 – Understand; K3 – Apply; K4 - Analyze

**MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | M          | M          | M          | S          |
| <b>CO2</b> | S          | M          | S          | M          | M          | M          |
| <b>CO3</b> | S          | S          | M          | M          | M          | S          |
| <b>CO4</b> | S          | S          | M          | M          | M          | S          |
| <b>CO5</b> | S          | S          | S          | M          | M          | S          |

S – Strong; M – Medium; L - Low

**Unit-I Introduction to Accounting****18 Hrs**

Meaning- Definition- Functions- Objectives- Users of Accounting Information- Accounting Concepts and Conventions – Advantages and Limitations of Accounting.

**Unit-II Double Entry System of Accounting****18 Hrs**

Meaning and concepts - Golden Accounting Rules- Journal Entries- Ledger- Trail Balance – Rectification of Errors (Simple Problems).

**Unit-III Final Accounts****18 Hrs**

Preparation of Trading Account, Profit and Loss Account and Balance Sheet- Adjustment Entries (Simple Problems).

**Unit-IV Single Entry System****18 Hrs**

Meaning - Features - Advantages - Limitations - Methods- Net Worth Method – Conversion Method (Simple Problems).

**Unit-V Average Due Date and Bank Reconciliation Statement****18 Hrs**

Average Due Date - Meaning -Uses – Problems - Bank Reconciliation Statement- Meaning- Reasons for Preparation- Procedures and Preparation of Bank Reconciliation statement (Simple Problems).

**DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%**  
**TEACHING METHODOLOGY:**

- Lecture given by Teacher
- Assignments.
- Discussions and Interactions.

**TEXT BOOK**

| <b>S.No</b> | <b>Author</b>        | <b>Title</b>         | <b>Publisher</b>     | <b>Year of Publication</b> |
|-------------|----------------------|----------------------|----------------------|----------------------------|
| 1           | T.S.Reddy and Murthy | Financial Accounting | Margham Publications | 2018                       |

**REFERENCE BOOKS**

| S.No | Author                         | Title  | Publisher           | Year of Publication |
|------|--------------------------------|--|---------------------|---------------------|
| 1    | M.C. Shukla and T.S. Grewal&co | Advanced Accounts                              | S. Chand & Co       | 2016                |
| 2    | R.L. Gupta                     | Financial Accounting                           | Sultan chand        | 2014                |
| 3    | S.P. Jain &K.L. Narang,        | Financial Accounting                           | Kalyani Publication | 2017                |
| 4    | R.S.N Pillai&V.Bagavathi       | Fundamental of Advanced Accounting, Volume – I | S. Chand & Co       | 2013                |

**SYLLABUS DESIGNER:**

1. Mrs.J.Anbazhagi, Assistant Professor of Commerce.
2. Dr.S.Gayathri, Assistant Professor of Commerce.

**ACCOUNTING FOR BUSINESS – II (Allied) B.C.A**

| Sem | Subject Code | Category | Lecture        |    | Theory         |    | Practical | Credit |
|-----|--------------|----------|----------------|----|----------------|----|-----------|--------|
| II  |              | Allied   | 6 hrs per week | 90 | 6 hrs per week | 90 | -         | 4      |

**COURSE OBJECTIVE:**

- To develop the skills for recording the various kinds of Business Transactions.

**COURSE OUTCOME**

On successful completion of this course, the students will be able

| CO NUMBER | CO STATEMENT   | KNOWLEDGE LEVEL (K1 – K5) |
|-----------|--|---------------------------|
| CO1       | To Understand the concept of Branch Accounting and enable the students to prepare Accounts for various types of Branches.        | K1                        |
| CO2       | To enhance the procedure for preparing Departmental Accounts.  | K2                        |
| CO3       | To Develop the skill of the students in preparing Hire Purchase Accounting, both in the books of Hire Purchaser and Hire Vendor. | K3                        |
| CO4       | To Understand the Accounting procedure for Partnership in cases like Admission, Retirement, Death.                               | K2                        |
| CO5       | To Understand the Accounting procedure for Dissolution and Insolvency of a Partner.  | K2                        |

Knowledge Level: K1 - Remember; K2 – Understand; K3 – Apply; K4 - Analyze

**MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | S          | M          | S          |
| <b>CO2</b> | S          | S          | M          | M          | S          | M          |
| <b>CO3</b> | S          | S          | M          | M          | M          | M          |
| <b>CO4</b> | S          | S          | M          | M          | S          | S          |
| <b>CO5</b> | S          | S          | M          | M          | S          | S          |

S- Strong; M – Medium; L - Low

**Unit – I Branch Accounts****18 Hrs**

Branch Accounts –Objectives – Types of Branches – Debtors System (at cost price and Invoice Price) – Independent Branch.

**Unit – II Departmental Accounts****18 Hrs**

Departmental Accounts – Objectives – Distinction between Departments and Branches – Allocation of common expenses – Expenses which cannot be allocated – Inter Department transfer at cost price and selling price.

**Unit – III Hire Purchase System****18 Hrs**

Hire Purchase system – Meaning – Journal Entries and Ledger Accounts in the books of Hire Purchaser and Hire Vendor – Default and Repossession -Complete Repossession only.

**Unit – IV Partnership Accounts – I****18 Hrs**

Partnership Accounts – Admission of Partner– Retirement of Partner – Death of a Partner (Simple Problems)

**Unit – V Partnership Accounts – II****18 Hrs**

Dissolution of Partnership Firm - Insolvency of a Partner -Insolvency of all Partners (Garner vs. Murray). (Simple Problems)

**DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%****TEACHING METHODOLOGY:**

- Lecture given by Teacher
- Assignments.
- Discussions and Interactions.

**TEXT BOOK**

| S.No | Author               | Title                | Publisher            | Year of Publication |
|------|----------------------|----------------------|----------------------|---------------------|
| 1    | T.S.Reddy and Murthy | Financial Accounting | Margham Publications | 2018                |

**REFERENCE BOOKS**

| S.No | Author                         | Title  | Publisher           | Year of Publication |
|------|--------------------------------|--|---------------------|---------------------|
| 1    | M.C. Shukla and T.S. Grewal&co | Advanced Accounts                              | S. Chand & Co       | 2016                |
| 2    | R.L. Gupta                     | Financial Accounting                           | Sultan chand        | 2014                |
| 3    | S.P. Jain &K.L. Narang,        | Financial Accounting                           | Kalyani Publication | 2017                |
| 4    | R.S.N Pillai&V.Bagavathi       | Fundamental of Advanced Accounting, Volume – I | S. Chand & Co       | 2013                |

**SYLLABUS DESIGNER:**

1. Mrs.J.Anbazhagi, Assistant Professor of Commerce.
2. Dr.S.Gayathri, Assistant Professor of Commerce.

**ALLIED ECONOMICS - UG****B.COM GENERAL****PROGRAMME EDUCATIONAL OBJECTIVES (PEO)**

**PEO 1:** To excel with the much needed business education, to ensure that students to be more competitive for employment and higher education.

**PEO 2:** To develop a broad range of business skills and knowledge, development of general and specific capabilities to meet the current and future expectation of business, industries and economy at the national and global level.

**PROGRAMME OUTCOMES (PO)**

**PO1:** To have comprehensive knowledge of finance, accounting, taxation, economics and business laws.

**PO2:** To equip with professional, inter-personal and entrepreneurial skills for economic and social growth.

**PO3:** To gear up with updated knowledge in implementing business practices.

**PO4:** To acquire effective skills like communication, decision making, problem solving in business activities.

**PO5:** To blend knowledge, skill and attitude that will sustain an environment of learning and creativity.

**PO6:** To impart value based and job oriented education, which ensures that the students are trained into up-to-date.

**SUBJECT: INDIAN ECONOMY - I**

| Sem | Programme | Subject Code | Category | Lecture     |               | Theory      |            | Practical | Credit |
|-----|-----------|--------------|----------|-------------|---------------|-------------|------------|-----------|--------|
| I   | B.Com     |              | Allied   | 6 hrs/ week | Total 90 hrs. | 6 hrs/ week | 90hrs/ Sem | -         | 5      |

**COURSE OBJECTIVES**

The main objective of this paper is to introduce the students to understand the broad concept of Indian Economy. The concept which helps the students to analyse and gain knowledge on various Economic policies of the Government of India.

**COURSE OUTCOMES:**

| CO Number  | CO Statement  | Knowledge Level (K1 – K5) |
|------------|---|---------------------------|
| <b>CO1</b> | To introduce the various indicators of Economic development.  | K2                        |
| <b>CO2</b> | To promote the knowledge to the students about the role of Agriculture in Economic development.                       | K3                        |
| <b>CO3</b> | To gain knowledge about the role of small scale industries towards Economic development.                              | K3                        |
| <b>CO4</b> | To acquire knowledge about the role of industries in Economic development.  | K3                        |
| <b>CO5</b> | To acquire the practical knowledge about the existing leading financial institutions for the promotion of industries. | K3                        |

**Knowledge Level (KL):** K1-Remember; K2-Understand; K3-Apply; K4-Analyse

**MAPPING WITH PROGRAMME OUTCOMES**

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | M   | M   | S   | M   |
| <b>CO2</b> | S   | M   | S   | S   | S   | S   |
| <b>CO3</b> | S   | S   | M   | M   | M   | M   |
| <b>CO4</b> | S   | S   | S   | M   | S   | S   |
| <b>CO5</b> | M   | M   | S   | S   | M   | S   |

S-Strong; M-Medium; L-Low

**Unit-I Introduction****18 hrs**

Meaning and Characteristics of Indian Economy - Determinants of Economic Development and Growth - Economic Factors - Non Economic Factors.

**Unit-II Agriculture****18 hrs**

Indian Agriculture - Contribution to Economic Development - Causes for Low Productivity – Measures to increase agricultural productivity in India - Green Revolution II- Mechanization of Agriculture - Definition – advantages and disadvantages - Problems of Indian Agricultural Marketing and its measures.

**Unit-III Small scale Industry****18 hrs**

Meaning and Definition of Small scale and Cottage industries - Role of Small scale industry in economic development – Problems of Small scale industry in India – Measures to promote Small scale industry. (18hrs)

**Unit-IV Large Scale Industry****18 hrs**

Role and Importance of Large scale industry in economic development –Industrial Disputes – Definition, causes and measures to settle disputes. Industrial sickness – Causes and measures.

**Unit-V Industrial Finance****18 hrs**

Industrial Finance- Meaning- Need and sources of finance - Internal and External sources - Industrial Financial Institutions (IDBI, SIDCO & SIDBI).

**TEACHING METHODOLOGY**

- Chalk and Board
- Lecture method
- Seminar by individual or Group
- Power point presentation

**Reference Books:**

| S.No | Title          | Author                | Publisher                                  | Edition                                 | Year |
|------|----------------|-----------------------|--|---|------|
| 1    | Indian Economy | DATT Ruddar & Sundram | Sultan Chand & Sons New Delhi              | Latest Edition                          | 2014 |
| 2    | Indian Economy | I.C.Dhingra           | Sultan Chand & Sons New Delhi              | Revised Edition                         | 2015 |
| 3    | Indian Economy | V.K.Puri<br>S.K.Misra | Himalaya Publishing House                  | 36 <sup>th</sup> Edition                | 2018 |
| 4    | Indian Economy | S.Sankaran            | Margham Publication                        | Preface to the 13 <sup>th</sup> Edition | 2014 |
| 5    | Indian Economy | Ramesh Singh          | Tata McGrew Hill Education Private Limited | 3 <sup>rd</sup> Edition                 | 2012 |



|   |                |                                |                               |                          |      |
|---|----------------|--------------------------------|-------------------------------|--------------------------|------|
|   |                |                                | New Delhi                     |                          |      |
| 6 | Indian Economy | R.L.Varshney<br>K.L.Maheshwari | Sultan Chand & Sons New Delhi | 15 <sup>th</sup> Edition | 2012 |
| 7 | Indian Economy | Sanjiv Verma                   | Unique Publishers New Delhi   |                          | 2012 |
| 8 | Indian Economy | A.N.Agarwal                    | Sultan Chand & Sons New Delhi | Revised Edition          | 2015 |

### **SUBJECT: INDIAN ECONOMY – II**

| <b>Sem</b> | <b>Programme</b> | <b>Subject Code</b> | <b>Category</b> | <b>Lecture</b> |            | <b>Theory</b> |             | <b>Practical</b> | <b>Credit</b> |
|------------|------------------|---------------------|-----------------|----------------|------------|---------------|-------------|------------------|---------------|
| II         | B.Com            |                     | Allied          | 6 hrs/ week    | 9 hrs/ sem | 6 hrs/ week   | 90 hrs/ Sem | -                | 5             |

### **COURSE OBJECTIVES**

To familiarize the fundamental concepts about National income in India and to provide an in-depth knowledge about Indian Economy. The knowledge acquired through this paper would help them to know the day today current changes towards Economic development.

### **COURSE OUTCOMES:**

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K1 – K5)</b> |
|------------------|---|----------------------------------|
| <b>CO1</b>       | To understand the formation of National Income in India.                                    | K2                               |
| <b>CO2</b>       | To acquire the knowledge about the planning concepts.                                       | K2                               |
| <b>CO3</b>       | To acquire knowledge on human resources to develop economic growth                          | K3                               |
| <b>CO4</b>       | To examine and apply the practical knowledge about finance to business growth.              | K3                               |
| <b>CO5</b>       | To familiarize the students with the principles and practices of foreign trade in business. | K3                               |

**Knowledge Level (KL):** K1-Remember; K2-Understand; K3-Apply; K4-Analyse

### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | S          | M          | S          |
| <b>CO2</b> | S          | M          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | S          | M          | S          |
| <b>CO4</b> | M          | M          | M          | S          | M          | S          |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO5</b> | M | M | S | M | M | S |
|------------|---|---|---|---|---|---|

S-Strong; M-Medium; L-Low

### **Unit-I National Income**

**18 Hrs**

National Income - Definition – Concepts – Methods to calculate National Income –Difficulties in the measurement of National Income –Recent Trends in India's National Income.

### **Unit-II Planning**

**18 Hrs**

Planning in India - General Objectives of Five Year Plans – Evaluation of 11<sup>th</sup> and 12<sup>th</sup> Five Year Plans - National Institution for Transforming India (NITIAYOG)-Functions.

### **Unit-III Human Resource Development:**

**18 Hrs**

Population - Causes and Consequences of Over Population - Human Resource and Economic Development – Indicators of Human Development Index – Components of HRD - Unemployment-Types- Causes- Remedial Measures- Employment Generation Programme- Employment Guarantee Act (2005)

### **Unit IV: Economic Reforms**

**18 Hrs**

Economic reforms since 1991 – Liberalisation – meaning - merits and demerits – Privatisation – meaning - ways of privatization - advantages and disadvantages – Globalisation : Definition - parameters of globalization- merits and demerits .

### **Unit-V Foreign Trade**

**18 Hrs**

Foreign Trade- Contribution to economic development of India - Balance of Trade- Balance of Payments- India's Balance of Payment Position- Measures to solve Disequilibrium in the Balance of Payment Position- Functions of IMF, IBRD and WTO.

### **TEACHING METHODOLOGY**

- Chalk and Board
- Lecture method
- Seminar by individual or Group
- Power point presentation

### **REFERENCE BOOKS:**

| <b>S.No</b> | <b>Title</b>   | <b>Author</b>         | <b>Publisher</b>              | <b>Edition</b>                          | <b>Year</b> |
|-------------|----------------|-----------------------|-------------------------------|---|-------------|
| 1           | Indian Economy | DATT Ruddar & Sundram | Sultan Chand & Sons New Delhi | Latest Edition                          | 2014        |
| 2           | Indian Economy | I.C.Dhingra           | Sultan Chand & Sons New Delhi | Revised Edition                         | 2015        |
| 3           | Indian Economy | V.K.Puri<br>S.K.Misra | Himalaya Publishing House     | 36 <sup>th</sup> Edition                | 2018        |
| 4           | Indian Economy | S.Sankaran            | Margham Publication           | Preface to the 13 <sup>th</sup> Edition | 2014        |

|   |                |                                |  |                          |      |
|---|----------------|--------------------------------|--|--------------------------|------|
| 5 | Indian Economy | Ramesh Singh                   | Tata McGraw Hill Education Private Limited New Delhi | 3 <sup>rd</sup> Edition  | 2012 |
| 6 | Indian Economy | R.L.Varshney<br>K.L.Maheshwari | Sultan Chand & Sons New Delhi                        | 15 <sup>th</sup> Edition | 2012 |
| 7 | Indian Economy | Sanjiv Verma                   | Unique Publishers New Delhi                          |                          | 2012 |
| 8 | Indian Economy | A.N.Agarwal                    | Sultan Chand & Sons New Delhi                        | Revised Edition          | 2015 |

#### **SYLLABUS DESIGNERS:**

1. Dr. R.Banumathy,  
Associate Professor and Head,  
Department of Economics.

2. Dr. M.Jayasudha,  
Assistant Professor,  
Department of Economics.

3. Dr. R.Radjavally,  
Assistant Professor,  
Department of Economics

### **B.COM (COMPUTER APPLICATIONS)**

#### **PROGRAMME EDUCATIONAL OBJECTIVES (PEO)**

**PEO 1:** To develop professional skills, values and knowledge to accept the challenges in industry and academics.

**PEO 2:** To excel in contemporary knowledge of business through information.

#### **PROGRAMME OUTCOMES (PO)**

**PO1:** To provide ample exposure in the field of commerce, accountancy, management and Economics through computer application

**PO2:** To develop the extensive knowledge in the field of computer application

**PO3:** To gear up with updated knowledge in implementing business practices

**PO4:** To acquire skills like effective communication, decision-making and problem solving in day to day business activities.

**PO5:** To gain comprehensive knowledge in finance, accounting, taxation and Economics.

**PO6:** To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity.

**SUBJECT: INDIAN ECONOMY - I**

| Sem | Programme  | Subject Code | Category | Lecture     |               | Theory      |            | Practical | Credit |
|-----|------------|--------------|----------|-------------|---------------|-------------|------------|-----------|--------|
| I   | B.Com (CA) |              | Allied   | 6 hrs/ week | Total 90 hrs. | 6 hrs/ week | 90hrs/ Sem | -         | 5      |

**COURSE OBJECTIVES**

The main objective of this paper is to introduce the students to understand the broad concept of Indian Economy. The concept which helps the students to analyse and gain knowledge on various Economic policies of the Government of India.

**COURSE OUTCOMES:**

| CO Number  | CO Statement  | Knowledge Level (K1 – K5) |
|------------|---|---------------------------|
| <b>CO1</b> | To introduce the various indicators of Economic development.  | K2                        |
| <b>CO2</b> | To promote the knowledge to the students about the role of Agriculture in Economic development.                       | K3                        |
| <b>CO3</b> | To gain knowledge about the role of small scale industries towards Economic development.                              | K3                        |
| <b>CO4</b> | To acquire knowledge about the role of industries in Economic development.  | K3                        |
| <b>CO5</b> | To acquire the practical knowledge about the existing leading financial institutions for the promotion of industries. | K3                        |

**Knowledge Level (KL):** K1-Remember; K2-Understand; K3-Apply; K4-Analyse

**MAPPING WITH PROGRAMME OUTCOMES**

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | M   | M   | S   | M   |
| <b>CO2</b> | S   | M   | S   | S   | S   | S   |
| <b>CO3</b> | S   | S   | M   | M   | M   | M   |
| <b>CO4</b> | S   | S   | S   | M   | S   | S   |
| <b>CO5</b> | M   | M   | S   | S   | M   | S   |

S-Strong; M-Medium; L-Low

**Unit-I Introduction****18 hrs**

Meaning and Characteristics of Indian Economy - Determinants of Economic Development and Growth - Economic Factors - Non Economic Factors.

**Unit-II Agriculture****18 Hrs**

Indian Agriculture - Contribution to Economic Development - Causes for Low Productivity – Measures to increase agricultural productivity in India - Green Revolution II- Mechanization of Agriculture - Definition – advantages and disadvantages - Problems of Indian Agricultural Marketing and its measures.

**Unit-III Small scale Industry****18 Hrs**

Meaning and Definition of Small scale and Cottage industries - Role of Small scale industry in economic development – Problems of Small scale industry in India – Measures to promote Small scale industry.

**Unit-IV Large Scale Industry****18 Hrs**

Role and Importance of Large scale industry in economic development –Industrial Disputes – Definition, causes and measures to settle disputes. Industrial sickness – Causes and measures.

**Unit-V Industrial Finance****18 Hrs**

Industrial Finance- Meaning- Need and sources of finance - Internal and External sources - Industrial Financial Institutions (IDBI, SIDCO & SIDBI).

**TEACHING METHODOLOGY**

- Chalk and Board
- Lecture method
- Seminar by individual or Group
- Power point presentation

**Reference Books:**

| S.No | Title          | Author                         | Publisher  | Edition                                 | Year |
|------|----------------|--------------------------------|--|---|------|
| 1    | Indian Economy | DATT Ruddar & Sundram          | Sultan Chand & Sons New Delhi                        | Latest Edition                          | 2014 |
| 2    | Indian Economy | I.C.Dhingra                    | Sultan Chand & Sons New Delhi                        | Revised Edition                         | 2015 |
| 3    | Indian Economy | V.K.Puri<br>S.K.Misra          | Himalaya Publishing House                            | 36 <sup>th</sup> Edition                | 2018 |
| 4    | Indian Economy | S.Sankaran                     | Margham Publication                                  | Preface to the 13 <sup>th</sup> Edition | 2014 |
| 5    | Indian Economy | Ramesh Singh                   | Tata McGrew Hill Education Private Limited New Delhi | 3 <sup>rd</sup> Edition                 | 2012 |
| 6    | Indian Economy | R.L.Varshney<br>K.L.Maheshwari | Sultan Chand & Sons New Delhi                        | 15 <sup>th</sup> Edition                | 2012 |
| 7    | Indian         | Sanjiv Verma                   | Unique   |   | 2012 |

|   |                |             |                               |                 |      |
|---|----------------|-------------|-------------------------------|-----------------|------|
|   | Economy        |             | Publishers New Delhi          |                 |      |
| 8 | Indian Economy | A.N.Agarwal | Sultan Chand & Sons New Delhi | Revised Edition | 2015 |

### SUBJECT: INDIAN ECONOMY – II

| Sem | Programme  | Subject Code | Category | Lecture     |            | Theory      |             | Practical | Credit |
|-----|------------|--------------|----------|-------------|------------|-------------|-------------|-----------|--------|
| II  | B.Com (CA) |              | Allied   | 6 hrs/ week | 9 hrs/ sem | 6 hrs/ week | 90 hrs/ Sem | -         | 5      |

#### COURSE OBJECTIVES

To familiarize the fundamental concepts about National income in India and to provide an in-depth knowledge about Indian Economy. The knowledge acquired through this paper would help them to know the day today current changes towards Economic development.

#### COURSE OUTCOMES:

| CO Number | CO Statement  | Knowledge Level (K1 – K5) |
|-----------|---|---------------------------|
| CO1       | To understand the formation of National Income in India.                                    | K2                        |
| CO2       | To acquire the knowledge about the planning concepts.                                       | K2                        |
| CO3       | To acquire knowledge on human resources to develop economic growth                          | K3                        |
| CO4       | To examine and apply the practical knowledge about finance to business growth.              | K3                        |
| CO5       | To familiarize the students with the principles and practices of foreign trade in business. | K3                        |

**Knowledge Level (KL):** K1-Remember; K2-Understand; K3-Apply; K4-Analyse

#### MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | S   | M   | S   |
| CO2 | S   | M   | S   | S   | S   | S   |
| CO3 | S   | S   | S   | S   | M   | S   |
| CO4 | M   | M   | M   | S   | M   | S   |
| CO5 | M   | M   | S   | M   | M   | S   |

S-Strong; M-Medium; L-Low

**Unit-I National Income****18 Hrs**

National Income - Definition – Concepts – Methods to calculate National Income –Difficulties in the measurement of National Income –Recent Trends in India's National Income

**Unit-II Planning****18 Hrs**

Planning in India - General Objectives of Five Year Plans – Evaluation of 11<sup>th</sup> and 12<sup>th</sup> Five Year Plans - National Institution for Transforming India (NITIAYOG)-Functions.

**Unit-III Human Resource Development:****18 Hrs**

Population - Causes and Consequences of Over Population - Human Resource and Economic Development – Indicators of Human Development Index – Components of HRD - Unemployment-Types- Causes- Remedial Measures- Employment Generation Programme- Employment Guarantee Act (2005)

**Unit IV: Economic Reforms:****18 Hrs**

Economic reforms since 1991 – Liberalisation – meaning - merits and demerits – Privatisation – meaning - ways of privatization - advantages and disadvantages – Globalisation : Definition - parameters of globalization- merits and demerits .

**Unit-V Foreign Trade****18 Hrs**

Foreign Trade- Contribution to economic development of India - Balance of Trade- Balance of Payments- India's Balance of Payment Position- Measures to solve Disequilibrium in the Balance of Payment Position- Functions of IMF, IBRD and WTO.

**TEACHING METHODOLOGY**

- Chalk and Board
- Lecture method
- Seminar by individual or Group
- Power point presentation

**REFERENCE BOOKS:**

| S.No | Title          | Author                | Publisher                                  | Edition                                 | Year |
|------|----------------|-----------------------|--|---|------|
| 1    | Indian Economy | DATT Ruddar & Sundram | Sultan Chand & Sons New Delhi              | Latest Edition                          | 2014 |
| 2    | Indian Economy | I.C.Dhingra           | Sultan Chand & Sons New Delhi              | Revised Edition                         | 2015 |
| 3    | Indian Economy | V.K.Puri<br>S.K.Misra | Himalaya Publishing House                  | 36 <sup>th</sup> Edition                | 2018 |
| 4    | Indian Economy | S.Sankaran            | Margham Publication                        | Preface to the 13 <sup>th</sup> Edition | 2014 |
| 5    | Indian Economy | Ramesh Singh          | Tata McGrew Hill Education Private Limited | 3 <sup>rd</sup> Edition                 | 2012 |

|   |                |                                |                               |                          |      |
|---|----------------|--------------------------------|-------------------------------|--------------------------|------|
|   |                |                                | New Delhi                     |                          |      |
| 6 | Indian Economy | R.L.Varshney<br>K.L.Maheshwari | Sultan Chand & Sons New Delhi | 15 <sup>th</sup> Edition | 2012 |
| 7 | Indian Economy | Sanjiv Verma                   | Unique Publishers New Delhi   |                          | 2012 |
| 8 | Indian Economy | A.N.Agarwal                    | Sultan Chand & Sons New Delhi | Revised Edition          | 2015 |

**SYLLABUS DESIGNERS:**

1. Dr. R.Banumathy,  
Associate Professor and Head,  
Department of Economics.

2. Dr. M.Jayasudha,  
Assistant Professor,  
Department of Economics.

3. Dr. R.Radjavally,  
Assistant Professor,  
Department of Economics

**DEPARTMENT OF ECONOMICS- PG**

**PROGRAMME EDUCATIONAL OBJECTIVES (PEO):**

**PEO 1:** To acquire wide spectrum of managerial skills along with competency building qualities in specific areas of business studies.

**PEO 2:** To offer quality education in the field of commerce at a higher level. To facilitate students in pursuing research work in the latest and upcoming trends of study in commerce.

**PROGRAMME OUTCOMES (PO):**

**PO 1:** To enhance the horizon of knowledge in various fields of commerce, economics and finance.

**PO 2:** To inculcate the knowledge of business and the techniques of managing Marketing, Insurance, International trade and Banking practices.

**PO 3:** To develop critical decision making skills through cost and management techniques, financial analysis and economic analysis.

**PO 4:** To attain proficiency in competitive exams like UGC NET and other competitive exams.

**PO 5:** To create awareness in application oriented research in business studies.

**PO 6:** To satisfy educational entrance requirements of relevant professional bodies or to launch a career in professional accounting.



## SUBJECT - MANAGERIAL ECONOMICS

| Sem | Programme | Subject Code | Category | Lecture     |               | Theory      |               | Practical | Credit |
|-----|-----------|--------------|----------|-------------|---------------|-------------|---------------|-----------|--------|
| I   | M.Com     |              | Core     | 6 hrs/ week | Total 90 hrs. | 6 hrs/ week | Total 90 hrs. | -         | 5      |

### COURSE OBJECTIVES:

To provide an in-depth knowledge about the Managerial Economics which help the students to analyse the business decisions in management.

### COURSE OUTCOMES:

| CO Number | CO Statement   | Knowledge Level (K1 – K5) |
|-----------|--|---------------------------|
| CO1       | To introduce the various knowledge about concepts in Managerial Economics used in many business. | K3                        |
| CO2       | To acquire the knowledge about the concepts of consumer equilibrium.                             | K3                        |
| CO3       | To analyse the various concepts of production function.  | K3                        |
| CO4       | To understand the knowledge about market situations in different markets.                        | K4                        |
| CO5       | Acquires knowledge on various pricing decisions in Business.                                     | K4                        |

**Knowledge Level (KL):** K1-Remember; K2-Understand; K3-Apply; K4-Analyse

### MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | M   | S   |
| CO2 | S   | M   | S   | S   | M   | S   |
| CO3 | M   | S   | M   | S   | M   | M   |
| CO4 | S   | S   | S   | S   | M   | S   |
| CO5 | M   | M   | S   | S   | M   | M   |

S-Strong; M-Medium; L-Low

### Unit-I Introduction

**18 Hrs**

Nature and Scope of Managerial Economics – Concept of Profit and Wealth Maximization – Law of Diminishing Marginal Utility – Critical Evaluation - Law of Demand – Determinants – Exceptions – Elasticity of Demand – factors – Types - Importance of the Study of Elasticity of Demand.

**Unit-II Indifference Curve Analysis****18 Hrs**

Utility Analysis- Ordinal and Cardinal Approach- Criticism of Utility Analysis - Indifference Curve Analysis- Importance - Properties of Indifference Curve- Indifference Map- Marginal Rate of Substitution (MRS)- Budget Line and Consumer's Equilibrium- Hicks- Allen Method- Slutsky Method- Criticism of Indifference Curve Analysis.

**Unit-III Production Function and Cost Concepts****18 Hrs**

Production Function – meaning - Laws of Returns - Law of Variable Proportion - Least Cost Combination of Production Function - Cost Concepts – Cost Classifications- Cost Control- Techniques of Cost Control- Cost Reduction - Revenue Concepts and its Types.

**Unit-IV Market Structure****18 Hrs**

Market Classifications - Perfect Competition – Monopoly - Price Discrimination - Monopolistic Competition – Oligopoly - Price and Output Determination under Different Markets situations.

**Unit-V Pricing Strategies and Methods****18 Hrs**

Pricing Policy- Objectives- Factors- Pricing Methods : Product Line Pricing- Pricing a New Product- Life Cycle of a Product- Resale Price Maintenance- Export Pricing- Dual Pricing.

**TEACHING PEDAGOGY**

The course is covered by adopting Lecture method, Seminar presentation by either group or by individual, Self-study and through Power Point presentation.

**REFERENCE BOOKS:**

| S.No. | Book                   | Author                                   | Publications                                | Year of Edition                       |
|-------|------------------------|--|---|---------------------------------------|
| 1.    | Managerial Economics   | H.L. Ahuja                               | S. Chand & Company Ltd                      | 3 <sup>rd</sup> Revised Edition 2009. |
| 2.    | Managerial Economics   | S. Sankaran                              | Margham Publications                        | 5 <sup>th</sup> Edition 2007.         |
| 3.    | Managerial Economics   | P.L. Mehta                               | Sultan chand & sons                         | 15 <sup>th</sup> Edition 2009.        |
| 4.    | Managerial Economics   | Dr. D. M. Milhani                        | Himalaya Publishing house                   | 5 <sup>th</sup> Edition 2009.         |
| 5.    | Managerial Economics   | Joel Deam                                | PHI Learning private limited New Delhi      | 1 <sup>st</sup> Edition 2010.         |
| 6.    | Managerial Economics   | P. N. Chopra                             | Kalyani publis house                        | 5 <sup>th</sup> Edition 2011.         |
| 7.    | Managerial Economics 7 | Geetika Piyali Ghosh purba Roy choudhury | Tata MC Graw Hill Education private limited | 2 <sup>nd</sup> Edition 2010.         |
| 8.    | Managerial Econmics    | R.L. Varshney and                        | Sultan chand & sons                         | 17 <sup>th</sup> Revised and enlarged |

|    |                      |               |                        |                              |
|----|----------------------|---------------|------------------------|------------------------------|
|    |                      | K.L.Maheswari |                        | edition 2003                 |
| 9. | Managerial Economics | D.N.Dwivedi   | Vikas Publishing House | 7 <sup>th</sup> Edition 2014 |

### SUBJECT – INTERNATIONAL ECONOMICS

| Sem | Programme | Subject Code | Category | Lecture    |               | Theory     |               | Practical | Credit |
|-----|-----------|--------------|----------|------------|---------------|------------|---------------|-----------|--------|
| II  | M.Com     |              | Core     | 6 hrs/week | Total 90 hrs. | 6 hrs/week | Total 90 hrs. | -         | 5      |

### COURSE OBJECTIVES:

To identify and explain economic concepts and theories related to the behavior of international markets, industry, financial institutions and foreign exchange.

To enable the students to face competitive exams and UGC NET exams.

### COURSE OUTCOMES:

| CO Number | CO Statement   | Knowledge Level (K1 – K5) |
|-----------|--|---------------------------|
| CO1       | To introduce the various knowledge about the concepts in International Economics used in Foreign trade . | K3                        |
| CO2       | To acquire the knowledge about the concepts of foreign direct investment                                 | K3                        |
| CO3       | To Know about the implications of globalization and explore the various international institutions.      | K3                        |
| CO4       | To have a comprehensive knowledge about balance of payment position in India                             | K4                        |
| CO5       | Acquires knowledge about foreign exchange market   | K4                        |

**Knowledge Level (KL):** K1-Remember; K2-Understand; K3-Apply; K4-Analyse

### MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | M   | M   | M   | M   | M   | M   |
| CO2 | M   | M   | S   | S   | M   | S   |
| CO3 | S   | S   | M   | M   | M   | M   |
| CO4 | M   | S   | M   | S   | M   | M   |
| CO5 | M   | S   | S   | S   | M   | S   |

S-Strong; M-Medium; L-Low

**UNIT – 1 Introduction****18 Hrs**

Nature and importance of international economics – International trade -advantages and disadvantages of foreign trade – Free Trade vs. Protection- Regulation and Promotion of foreign trade – composition and Direction of trade.

**UNIT – II Foreign Direct Investment****18 Hrs**

Meaning – Importance of Foreign Direct Investment - Reason of foreign Direct Investment – Pros and Cons of Foreign Direct Investment - Foreign Exchange – Convertibility of Rupees and its implications .

**UNIT – III International Organisation****18 Hrs**

International Institutions : Functions and policies of International Monetary Fund (I.M.F)- International Bank for Reconstruction and Development (IBRD)- International Development Association (IDA) – World Trade Organisation (WTO)-Asian Development Bank (ADB)-International Finance Corporation (IFC).

**UNIT – IV Balance of Payments****18 Hrs**

Meaning - Current Balance of Payments positions - causes for disequilibrium and measures to correct disequilibrium in the balance of payment position – Promotion of foreign trade - EXIM Bank - EXIM policy of India

**UNIT – V Foreign Exchange Market****18 Hrs**

Meaning – demand and supply of foreign exchange – Functions of Foreign exchange market – Heckscher Ohlin Theory ( Modern Theory of Factor Endowments)

**TEACHING PEDAGOGY**

The course is covered by adopting Lecture method, Seminar presentation by either group or by individual, Self-study and through Power Point presentation.

**REFERENCE BOOKS:**

| S.No. | Book   | Author         | Publications                     | Year of Edition |
|-------|--|----------------|----------------------------------|-----------------|
| 1.    | International trade                          | M.L.Jhingan    | Vrinda Publications<br>New Delhi | 2016            |
| 2.    | International Economics                      | Dr. S.Sankaran | Margham Publications, Chennai    | 2012            |
| 3.    | International Trade and Economic Development | Sugata Margit  | Oxford University Press-         | 2008            |
| 4.    | International                                | Dominic        | Wiley Publishing                 | 2012            |

|    |  |  |                                |      |
|----|--|--|--------------------------------|------|
|    | Economics<br>Trade and Finance                     | Salvatore                                  | House New Delhi                |      |
| 5. | International trade<br>&Economic<br>Development    | Rajat Acharya &<br>Saibal Kar              | Oxford University<br>Press-    | 2014 |
| 6. | Foreign Exchange                                   | C.Jeevanandam                              | Sultan Chand and<br>Sons       | 2004 |
| 7. | International<br>Economics, Theory<br>and Practice | Paul<br>R.Krugman&<br>Maurice<br>Obstfield | Pearson<br>Education,Singapore | 2003 |
| 8. | International<br>Economics                         | Bo Sodersten<br>and Geoffrey Reed          | Macmillan, London              | 2003 |

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3. Dr. R.Radjavally,  
Assistant Professor,  
Department of Economics

### **DEPARTMENT OF MATHEMATICS – UG**

#### **PROGRAMME EDUCATIONAL OBJECTIVES (PEO):**

**PEO 1:** To develop problem-solving skills and apply them independently to problems in pure and applied mathematics.

**PEO 2:** To develop abstract mathematical thinking.

#### **PROGRAMME OUTCOMES (PO):**

**PO 1:** Students majoring in Mathematics attain proficiency in Critical thinking, Problem solving and perform computations in higher mathematics and logical reasoning.

**PO 2:** Demonstrate proficiency in writing proofs.

**PO 3:** Formulate and analyze mathematical problems, precisely define the key terms, and draw clear and reasonable conclusions.

**PO 4:** Use mathematical ideas to solve real-world problems

**PO 5:** Students will be able to enhance analytical thinking to solve problems.

**PO 6:** Access and apply knowledge of computing and mathematics appropriate to the connected areas.

## DEPARTMENT OF MATHEMATICS

### B.SC. MATHEMATICS CBCS PATTERN

#### *THE COURSE OF STUDY AND THE SCHEME OF EXAMINATION*

| S.NO         | PART | STUDY COMPONENT S | INS. HRS./WEEK | CREDIT | TITLE OF THE PAPER                                  | CIA | UNIV EXAM | TOTAL |
|--------------|------|-------------------|----------------|--------|---|-----|-----------|-------|
| SEMESTER – I |      |                   |                |        |   |     |           |       |
| 1            | I    | Language –I       | 6              | 4      | Tamil –I /other language                            | 25  | 75        | 100   |
| 2            | II   | English –I        | 6              | 4      | English –I  | 25  | 75        | 100   |
| 3            | III  | Core paper –I     | 5              | 4      | Algebra   | 25  | 75        | 100   |
| 4            | III  | Core paper –II    | 4              | 4      | Trigonometry  | 25  | 75        | 100   |
| 5            | III  | Allied Paper –I   | 4              | 4      | Allied Physics-I/ Allied Mathematical Statistics- I | 25  | 75        | 100   |
| 6            | III  | Allied– Practical | 3              | 0      | Allied Practical: Physics/ Mathematical Statistics  | 0   | 0         | 0     |
| 7            | IV   | EVS               | 2              | 2      | EVS   | 25  | 75        | 100   |
|              |      |                   | 30             | 22     |   | 150 | 450       | 600   |
| SEMESTER –II |      |                   |                |        |   |     |           |       |
| 1            | I    | Language –II      | 6              | 4      | Tamil –II /other language                           | 25  | 75        | 100   |
| 2            | II   | English –II       | 4              | 4      | English –II   | 25  | 75        | 100   |
| 3            | III  | Core paper –III   | 5              | 4      | Calculus  | 25  | 75        | 100   |

|                      |     |                            |           |           |  |            |            |            |
|----------------------|-----|----------------------------|-----------|-----------|--|------------|------------|------------|
| 4                    | III | Core paper –IV             | 4         | 4         | Solid Geometry   | 25         | 75         | 100        |
| 5                    | III | Allied Paper –II           | 4         | 4         | Allied Physics-II/<br>Allied Mathematica<br>I<br>Statistics- II    | 25         | 75         | 100        |
| 6                    | III | Allied–<br>Practical       | 3         | 2         | Allied<br>Practical:<br>Physics/<br>Mathematica<br>I<br>Statistics | 40         | 60         | 100        |
| 7                    | IV  | Value Education            | 2         | 2         | Value Education  | -          | 50         | 50         |
| 8                    | IV  | Soft Skill                 | 2         | 1         | Soft Skill   | -          | 50         | 50         |
|                      |     |                            | <b>30</b> | <b>25</b> |  | <b>165</b> | <b>535</b> | <b>700</b> |
| <b>SEMESTER III</b>  |     |                            |           |           |  |            |            |            |
| 1                    | I   | Language –III              | 6         | 4         | Tamil –III /other<br>language                                      | 25         | 75         | 100        |
| 2                    | II  | English –III               | 6         | 4         | English –III   | 25         | 75         | 100        |
| 3                    | III | Core paper –V              | 4         | 4         | Differential Equations<br>& Laplace Transforms                     | 25         | 75         | 100        |
| 4                    | III | Elective – I               | 4         | 3         | Fourier Analysis   | 25         | 75         | 100        |
| 5                    | III | Allied Paper –IV           | 6         | 5         | Financial Accounting I   | 25         | 75         | 100        |
| 6                    | IV  | Skill Based Subject<br>–I  | 2         | 2         | Mathematics for<br>competitive<br>Examination                      | -          | 50         | 50         |
| 7                    | IV  | Non Major –I               | 2         | 2         | Functional<br>Mathematics  | -          | 50         | 50         |
|                      |     |                            | <b>30</b> | <b>24</b> |  | <b>125</b> | <b>475</b> | <b>600</b> |
| <b>SEMESTER – IV</b> |     |                            |           |           |  |            |            |            |
| 1                    | I   | Language –IV               | 6         | 4         | Tamil –IV /other<br>language                                       | 25         | 75         | 100        |
| 2                    | II  | English –IV                | 6         | 4         | English –IV  | 25         | 75         | 100        |
| 3                    | III | Core paper –VI             | 4         | 4         | Abstract Algebra   | 25         | 75         | 100        |
| 4                    | III | Elective – II              | 4         | 3         | Vector Analysis  | 25         | 75         | 100        |
| 5                    | III | Allied Paper –IV           | 6         | 5         | Financial Accounting-<br>II  | 25         | 75         | 100        |
| 6                    | IV  | Skill Based Subject-<br>II | 2         | 2         | Quantitative<br>Techniques   | -          | 50         | 50         |

|                     |     |                          |           |           |                       |            |            |            |
|---------------------|-----|--------------------------|-----------|-----------|-----------------------|------------|------------|------------|
| 7                   | IV  | Non Major –II            | 2         | 2         | Functional Statistics | -          | 50         | 50         |
|                     |     |                          | <b>30</b> | <b>24</b> |                       | <b>125</b> | <b>475</b> | <b>600</b> |
| <b>SEMESTER – V</b> |     |                          |           |           |                       |            |            |            |
| 1                   | III | Core paper – VII         | 6         | 4         | Linear Algebra        | 25         | 75         | 100        |
| 2                   | III | Core paper – VIII        | 6         | 4         | Real Analysis- I      | 25         | 75         | 100        |
| 3                   | III | Core paper –IX           | 6         | 4         | Statics               | 25         | 75         | 100        |
| 4                   | III | Core paper –X            | 5         | 3         | Operations Research   | 25         | 75         | 100        |
| 5                   | III | Elective –III            | 5         | 3         | Graph Theory          | 25         | 75         | 100        |
| 6                   | IV  | Skill Based Subject –III | 2         | 2         | Numerical Methods     | -          | 50         | 50         |
|                     |     |                          | <b>30</b> | <b>20</b> |                       | <b>125</b> | <b>425</b> | <b>550</b> |

|                      |     |                         |            |            |                                  |            |            |             |
|----------------------|-----|-------------------------|------------|------------|----------------------------------|------------|------------|-------------|
| <b>SEMESTER – VI</b> |     |                         |            |            |                                  |            |            |             |
| 1                    | III | Core paper – XI         | 5          | 4          | Real Analysis- II                | 25         | 75         | 100         |
| 2                    | III | Core paper – XII        | 5          | 4          | Dynamics                         | 25         | 75         | 100         |
| 3                    | III | Core paper – XIII       | 5          | 4          | Complex Analysis                 | 25         | 75         | 100         |
| 4                    | III | Core paper – XIV        | 5          | 3          | Programming in C Language-Theory | 25         | 75         | 100         |
| 5                    | III | Core Practical          | 3          | 2          | Computer Practical in C language | 40         | 60         | 100         |
| 6                    | III | Elective –IV            | 5          | 3          | Operations Research              | 25         | 75         | 100         |
| 7                    | IV  | Skill Based Subject –IV | 2          | 2          | Fuzzy Mathematics                | -          | 50         | 50          |
| 8                    | V   | Extension Activities    | -          | 3          |                                  | 100        | 0          | 100         |
|                      |     |                         | <b>30</b>  | <b>25</b>  |                                  | <b>265</b> | <b>485</b> | <b>750</b>  |
|                      |     | <b>Total</b>            | <b>180</b> | <b>140</b> |                                  |            |            | <b>3800</b> |

### CONSOLIDATED STATEMENT

| PART       | SUBJECT                  | PAPER S | HOURS | CREDI T | TOTAL CREDIT S | MARKS | TOTAL MARKS |
|------------|--------------------------|---------|-------|---------|----------------|-------|-------------|
| Part – I   | Language                 | 4       | 24    | 4       | 16             | 100   | 400         |
| Part – II  | English                  | 4       | 22    | 4       | 16             | 100   | 400         |
| Part – III | Allied Theory (Odd Sem.) | 2       | 10    | 4-5     | 9              | 100   | 200         |
|            | Allied Theory (Even      | 2       | 10    | 4-5     | 9              | 100   | 200         |



|           |                                       |    |            |     |            |     |             |
|-----------|---------------------------------------|----|------------|-----|------------|-----|-------------|
|           | Sem.)                                 |    |            |     |            |     |             |
|           | Allied Practical<br>(Odd & Even Sem.) | 1  | 3+3        | 2   | 2          | 100 | 100         |
|           | Electives                             | 4  | 18         | 3   | 12         | 100 | 400         |
|           | Core – Theory                         | 14 | 69         | 3-4 | 54         | 100 | 1400        |
|           | Core– Practical                       | 1  | 3          | 2   | 2          | 100 | 100         |
| Part – IV | Environmental Science                 | 1  | 2          | 2   | 2          | 100 | 100         |
|           | Soft Skills                           | 1  | 2          | 1   | 1          | 50  | 50          |
|           | Value Education                       | 1  | 2          | 2   | 2          | 50  | 50          |
|           | Language and others/<br>NME           | 2  | 4          | 2   | 4          | 50  | 100         |
|           | Skill Based                           | 4  | 8          | 2   | 8          | 50  | 200         |
| Part – V  | Extension Activities                  | 1  | -          | 3   | 3          | 100 | 100         |
|           | <b>Total</b>                          |    | <b>180</b> |     | <b>140</b> |     | <b>3800</b> |

### ALGEBRA

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| I        |              | Core     | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 4      |
|          |              |          | 5        | 75      | 5        | 75      |           |        |

#### COURSE OBJECTIVES

- In this course students are exposed to topics like Theory of Equations, Summation of Series, Matrices, Continued Fraction and Elementary Number Theory.
- The stress is on the development of problem solving skills.

#### COURSE OUTCOMES

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To introduce the concept of Polynomial Equation and to solve it                         | K3                      |
| <b>CO2</b> | To solve the problems using Horner's method and Newton's method                         | K3                      |
| <b>CO3</b> | To gain expertise in the concept of Summation of Series                                 | K2                      |
| <b>CO4</b> | To study the types of matrices, Cayley Hamilton theorem and Diagonalisation of a Matrix | K2                      |
| <b>CO5</b> | To acquire practical knowledge in the field of elementary number theory                 | K4                      |

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

**MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | S          | M          |
| <b>CO2</b> | S          | S          | M          | M          | S          | M          |
| <b>CO3</b> | S          | S          | M          | S          | M          | S          |
| <b>CO4</b> | M          | M          | S          | S          | M          | S          |
| <b>CO5</b> | M          | S          | S          | M          | S          | S          |

S- Strong; M-Medium; L-Low

**UNIT- I: THEORY OF EQUATIONS****15Hrs**

Polynomial Equation – Imaginary and Irrational roots – Symmetric Function of roots in terms of Coefficient – Sum of  $r^{\text{th}}$  powers of roots – Reciprocal Equation – Transformation of Equation.

**UNIT- II: THEORY OF EQUATIONS [Contd.]****15Hrs**

Descartes Rule of Signs – Approximate Solutions of Polynomials by Horner's method- Newton's method.

**UNIT- III: SUMMATION OF SERIES****15Hrs**

Binomial, Exponential and Logarithmic series (Theorems without proofs) – Simple Problems

**UNIT- IV: MATRICES****15Hrs**

Symmetric, Skew Symmetric, Hermitian and Skew Hermitian Matrices- Orthogonal and Unitary Matrices - Rank of Matrix- Consistency and Solutions of Linear Systems- Cayley Hamilton Theorem (without proof)- Eigen Values-Eigen Vectors-Similar Matrices-Diagonalisation of a Matrix.

**UNIT – V: ELEMENTARY NUMBER THEORY****15Hrs**

Prime Number-Composite Number-Decomposition of a Composite Number as a Product of Primes Uniquely (without proof)-Divisors of a positive integer-Congruence Modulo  $n$ -Euler Function(without proof)- Highest power of a Prime Number  $p$  contained in  $n!$ -Fermat's and Wilson's Theorems

**DISTRIBUTION OF MARKS: THEORY 5% AND PROBLEMS: 95%**

**TEXT BOOKS**

| <b>S.NO</b> | <b>AUTHORS</b>   | <b>TITLE</b> | <b>PUBLISHERS</b>                                  | <b>YEAR OF PUBLICATION</b> |
|-------------|--|--------------|--|----------------------------|
| 1.          | T.K.Manickavachagom Pillay,<br>T.N.Natarajan and K.S.Ganapathy<br>Volume I & II. | Algebra      | S.Viswanathan<br>Printers & Publishes<br>Pvt. Ltd. | 2004                       |

## REFERENCE BOOKS

| S.NO | AUTHORS        | TITLE                    | PUBLISHERS                 | YEAR OF PUBLICATION |
|------|----------------|--------------------------|----------------------------|---------------------|
| 1.   | S.Arumugam     | Algebra                  | New Gamma Publishing House | 2003                |
| 2.   | A.Singaravellu | Algebra and Trigonometry | Meenakshi Agency           | 2003                |

## WEBSOURCES

1. [http://lib1.org/\\_ads/390EDD85BC279835BA7847DA4724CB9C](http://lib1.org/_ads/390EDD85BC279835BA7847DA4724CB9C)

## TEACHING METHODOLOGY

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

## SYLLABUS DESIGNER

1. Mrs. L.Sowmyalatha, Head and Associate Professor of Mathematics.
2. Ms. S.Santhiya, Assistant Professor of Mathematics.

## TRIGONOMETRY

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| I        |              | Core     | Hrs/Week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 4      |
|          |              |          | 4        | 60      | 4        | 60      |           |        |

## COURSE OBJECTIVES

- To apply and establish the concept of trigonometric identities in proving the given statement
- To improve problem solving skills in Trigonometry

## COURSE OUTCOMES

| CO Number | CO Statement                                      | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To develop the knowledge about Expansions         | K1                      |
| CO2       | To expand inverse circular functions              | K2                      |
| CO3       | To evaluate circular and hyperbolic functions     | K3                      |
| CO4       | To study the concepts of logarithms of quantities | K3                      |
| CO5       | To find the expansion of various types of series  | K3                      |

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

## MAPPING WITH PROGRAMME OUTCOMES

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | M   | M   | S   | M   | S   | S   |
| CO2 | S   | S   | S   | M   | S   | S   |
| CO3 | S   | S   | S   | M   | S   | M   |
| CO4 | M   | M   | S   | S   | M   | S   |
| CO5 | S   | S   | M   | S   | M   | S   |

S- Strong; M- Medium; L- Low

### UNIT I : EXPANSIONS

12 Hrs

Expansions of  $\cos n\theta$ ,  $\sin n\theta$ - Expansion of  $\tan n\theta$  - Expansion of  $\tan [A+B+C+...]$  – Formation of Equations - Solution of Trigonometric equations.

### UNIT II : EXPANSIONS (Contd.)

12 Hrs

$\sin^n \theta$ ,  $\cos^n \theta$  in terms of Functions of multiples of  $\theta$  - Expansions of  $\sin \theta$ ,  $\cos \theta$  and  $\tan \theta$  in a series of ascending powers of  $\theta$  – Expansion of Inverse circular Functions.

### UNIT III : HYPERBOLIC FUNCTIONS

12 Hrs

Definition – Relation between circular and Hyperbolic Functions – Inverse Hyperbolic Functions.

### UNIT IV : LOGARITHM AND SUMMATION OF SERIES

12 Hrs

Logarithm of complex quantities. Summation of Series using Differences.

### UNIT V : SUMMATION OF TRIGONOMETRIC SERIES

12 Hrs

Gregory Series- Euler Series –  $C+iS$  method.

**DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS: 80%**

### TEXT BOOKS

| S.NO | AUTHORS                                      | TITLE        | PUBLISHERS  | YEAR OF PUBLICATION |
|------|--|--------------|---|---------------------|
| 1.   | S.Narayanan and T. K. Mancikavachagom Pillay | Trigonometry | S.Viswanathan printers & Publishers Pvt. Ltd. Chennai | 2004                |

## REFERENCE BOOKS

| S.NO | AUTHORS                               | TITLE   | PUBLISHERS                             | YEAR OF PUBLICATION |
|------|---------------------------------------|---|--|---------------------|
| 1.   | P. Kandasamy.<br>K.Thilagavathy       | Mathematics for<br>B.Sc. Vol- I,II,II &<br>IV | S.Chand&Company Ltd.<br>New Delhi-55.  | 2004                |
| 2.   | Duraipandian and<br>LaxmiDuraipandian | Trigonometry                                  | Emerald Publishers,<br>Chennai         | 1984                |
| 3.   | B.SGrewal                             | Higer Engineering<br>Mathematics              | Khanna Publishers, New<br>Delhi.       | 2002                |
| 4.   | S.L.Loney                             | Plane<br>Trigonometry, Part<br>II             | Cambridge University<br>Press, London. | 1982                |
| 5.   | A. Singaravelu                        | Algebra and<br>Trigonometry, Vol- I<br>and II | Meenakshi Agency,<br>Chennai           | 2003                |
| 6.   | P.R.Vittal                            | Trigonometry                                  | MargamPublications,Ch<br>ennai.        | 2004                |

## WEB RESOURCES

1. <https://open.umn.edu/opentextbooks/textbooks/algebra-and-trigonometry>
2. <https://www.emathinstruction.com/algebra-2-trigonometry/>

## TEACHING METHODOLOGY

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5.PPT Presentations

## SYLLABUS DESIGNERS

- 1.Mrs. L. Sowmyalatha, Head and Associate Professor of Mathematics.
2. Ms. R.Chithra, Assistant Professor of Mathematics.

## ALLIED MATHEMATICAL STATISTICS-I

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| I        |              | Allied   | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 5      |
|          |              |          | 4        | 60      | 4        | 60      |           |        |

### COURSE OBJECTIVE

- The objective of this course is to provide an intense foundational introduction to the fundamental concepts in Statistics.
- This course concentrates on pertinent and concrete examples and applications.

### COURSE OUTCOMES

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To understand Addition and Multiplication laws of Probability, Independence of Events, Conditional Probability and Baye's theorem | K4                      |
| <b>CO2</b> | To acquire knowledge about Random Variables, Expectation, Moments and to solve problems   | K3                      |
| <b>CO3</b> | To learn about Moment Generating Function, Characteristic Function, Properties, Inversion and Uniqueness Theorem                  | K3                      |
| <b>CO4</b> | To gain knowledge about Correlation, Karl Pearson's Coefficient of Correlation and Rank Correlation.                              | K3                      |
| <b>CO5</b> | To have practical knowledge in Regression   | K3                      |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

| MAPPING OF PROGRAM OUTCOMES COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|---------------------------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b>                      | S   | S   | M   | S   | M   | S   |
| <b>CO2</b>                      | S   | S   | S   | S   | S   | S   |
| <b>CO3</b>                      | M   | S   | M   | M   | S   | S   |
| <b>CO4</b>                      | S   | S   | M   | S   | M   | S   |
| <b>CO5</b>                      | S   | S   | M   | S   | S   | S   |

S- Strong; M-Medium; L-Low

**UNIT- I : THEORY OF PROBABILITY****12 Hrs**

Basic Terminology- Mathematical Probability- Statistical Probability – Axiomatic Probability - Some Theorems on Probability – Addition Theorem of Probability – Extension of Addition Theorem of Probability to n Events – Boole’s Inequality - Conditional Probability -Multiplication Theorem of Probability – Independent Events – Bayes’ Theorem- Simple Problems.

**UNIT- II : RANDOM VARIABLES AND DISTRIBUTION FUNCTIONS 12 Hrs**

Introduction – Distribution Function-Discrete Random Variable- Continuous Random Variable–Two Dimensional Random Variables – Joint Probability Mass Function – Two Dimensional Distribution Function – Marginal Distribution Functions – Joint Density Function, Marginal Density Function - Conditional Distribution Function and Conditional Probability Density Function –Mathematical Expectation – Expected Value of function of a Random Variable – Properties of Expectation – Properties of Variance – Covariance - Simple Problems.

**UNIT- III : MOMENT GENERATING AND CHARACTERISTIC FUNCTIONS 12 Hrs**

Moment Generating Function -Characteristic Function – Properties of Characteristic Function – Some Important Theorems- Inversion Theorem (Levy Theorem - Statement only)-Uniqueness Theorem of characteristic Function(Statement only) – Simple problems.

**UNIT- IV: CORRELATION****12 Hrs**

Introduction –Meaning of Correlation - ScatterDiagram - Karl Pearson’s Coefficient of Correlation - Calculation of the Correlation Coefficient for a Bivariate Frequency Distribution - Rank Correlation-Simple Problems.

**UNIT – V- LINEAR AND CURVILINEAR REGRESSION****12 Hrs**

Introduction-Linear Regression – Curvilinear Regression-Regression Curves-Simple Problems.

**DISTRIBUTION OF MARKS: THEORY 5% AND PROBLEMS 95%****TEXT BOOKS**

| S.No | AUTHORS                  | TITLE                                   | PUBLISHERS     | YEAR OF PUBLICATION |
|------|--------------------------|---|----------------|---------------------|
| 1    | S. C. Gupta & V.K Kapoor | Fundamentals of Mathematical Statistics | Sultan & Sons. | 1974                |

**REFERENCE BOOKS**

| S.No | AUTHORS                           | TITLE                                   | PUBLISHERS     | YEAR OF PUBLICATION |
|------|-----------------------------------|---|----------------|---------------------|
| 1    | Hogg, R.V. & Craig.A              | Introduction to Mathematical Statistics | Macmillan      | 1998                |
| 2    | Mood.A.M Graybill.F.A. & Boes.D.G | Introduction to Theory of Statistics    | McGraw Hill    | 1974                |
| 3    | Wilks S.S                         | Elementary Statistics Analysis.         | Oxford and IBH | -                   |

|   |                                |  |                |      |
|---|--------------------------------|--|----------------|------|
| 4 | Snedecor. G. W<br>&Cochran.W.G | Statistical Methods                        | Oxford and IBH | 1967 |
| 5 | Hoel,P.G(1971)                 | Introduction to<br>Mathematical Statistics | Wiley.         | 1971 |

## WEB SOURCES

1. [www.statisticssolutions.com/correlation-pearson-kendall-spearman/](http://www.statisticssolutions.com/correlation-pearson-kendall-spearman/)
2. <http://www.srmuniv.ac.in/sites/default/files/downloads/CORRELATION.pdf>
3. <https://towardsdatascience.com/linear-regression-detailed-view-ea73175f6e86>

## TEACHING METHODOLOGY

1. Black Board Teaching
2. Smart Board Class Teaching
3. Giving Assignments for each units
4. Class room Discussions and seminars.
5. PPT Presentations.

## SYLLABUS DESIGNER

1. Mrs.K.Kavitha, Assistant Professor of Mathematics.
2. Ms. R.Chithra , Assistant Professor of Mathematics.

| Semester | Subject Code | Category         | Lecture  |         | Theory | Practical |         | Credit |
|----------|--------------|------------------|----------|---------|--------|-----------|---------|--------|
| I &II    |              | Allied Practical | Hrs/week | Hrs/Sem | 0      | Hrs/week  | Hrs/Sem | 2      |
|          |              |                  | 3        | 45      |        | 3         | 45      |        |

## ALLIED PRACTICAL - MATHEMATICAL STATISTICS

## COURSE OBJECTIVES

- To apply statistical methods to solve mathematical problems
- To use statistical test in testing hypothesis on data.

## SYLLABUS

1. Measures of location and Dispersion (absolute and relative).
2. Computation of Correlation Coefficient for Raw and Grouped data, Rank correlation coefficient.
3. Computation of Regression Equations for Raw and Grouped data.



4. Curve Fitting by the method of Least Square

- a.  $y = ax + b$
- b.  $y = ax^2 + bx + c$
- c.  $y = ae^{bx}$
- d.  $y = ax^b$

5. Fitting of Binomial, Poisson, Normal Distributions and Test of Goodness of fit.

6. Large Sample tests with regard to population, mean, proportion, standard deviation.

7. Exact test with respect to mean, variance and coefficient of correlation.

8. Test of Independence of attributes based on chi – square distribution.

9. Confidence Interval based on Normal, t and chi – square and F distribution.

10. Problems based on ANOVA – One way and Two way classification.

11. Completely Randomized Design.

12. Randomized Block Design.

**DISTRIBUTION OF MARKS: PROBLEMS 100%**

**TEXT BOOK**

| S.NO | AUTHORS                    | TITLE                | PUBLISHERS        | YEAR OF PUBLICATION |
|------|----------------------------|----------------------|-------------------|---------------------|
| 1.   | S.P.Gupta                  | Statistical Methods  | S Chand & Company | 2013                |
| 2.   | R.S.N. Pillai<br>Bagavathi | Practical Statistics | S Chand & Company | 2010                |

**REFERENCE BOOKS**

| S.NO | AUTHORS                               | TITLE                                   | PUBLISHERS                 | YEAR OF PUBLICATION |
|------|---------------------------------------|---|----------------------------|---------------------|
| 1.   | Hogg, R.V. & Craig, A.T               | Introduction to Mathematical Statistics | Macmillan                  | 1998                |
| 2.   | Mood, A.M, Graybill, F.A. & Boes, D.G | Introduction to Theory of Statistics    | McGraw Hill                | 1974                |
| 3.   | Snedecor, G. W & Cochran, W.G         | Statistical Methods                     | Oxford and IBH             | 1967                |
| 4.   | Hoel, P.G                             | Introduction to Mathematical Statistics | Wiley Eastern              | 1971                |
| 5.   | S. C. Gupta & V.K Kapoor              | Fundamentals of Mathematical Statistics | Sultan & Chand Sons        | 2011                |
| 6.   | Wilks S.S                             | Elementary Statistics Analysis          | Princeton University Press | 2016                |

## WEB SOURCES

1. <http://en.wikipedia.org/wiki/statistics>.
2. <http://en.wikipedia.org/wiki/mathematics>

## TEACHING METHODOLOGY

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

## SYLLABUS

1. Mrs. G. VinuPriya, Assistant Professor of Mathematics
2. Mrs. G.Chitra , Assistant Professor of Mathematics

## CALCULUS

| Semester | Subject Code | Category   | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|------------|----------|---------|----------|---------|-----------|--------|
| I        |              | Core - III | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 4      |
|          |              |            | 5        | 75      | 5        | 75      |           |        |

## COURSE OBJECTIVES

- To impart knowledge about the fundamental principles, concepts in the areas of Differential and Integral Calculus.
- This prepares the students to apply the acquired knowledge and skills in other courses.

## COURSE OUTCOMES

| CO Number | CO Statement  | Knowledge Level(K1-K4) |
|-----------|---|------------------------|
| CO1       | To calculate the maxima and minima of differential equations                          | K1                     |
| CO2       | To develop the knowledge about radius of curvature in Cartesian and Polar coordinates | K2                     |
| CO3       | To understand the concept of Involutives, Evolutives and Asymptotes                   | K2                     |
| CO4       | To deepen the knowledge of Beta and Gamma functions                                   | K3                     |
| CO5       | To evaluate the area, volume and surface area using double and triple integrals       | K4                     |

*Knowledge Level: K1-Remember, K2-Understand, K3-Apply, K4-Analyze*

## MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | S   | S   | S   |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO2</b> | M | M | S | S | S | S |
| <b>CO3</b> | S | M | M | S | S | S |
| <b>CO4</b> | S | S | S | S | S | S |
| <b>CO5</b> | S | S | M | S | M | S |

### **UNIT-I: DIFFERENTIAL CALCULUS**

**15 Hrs**

$n^{\text{th}}$  Derivative- Leibnitz's theorem (without Proof) and its application- Total Differential -Maxima and Minima functions of two and three independent variable, Lagrange's method (Without proof), problems on this concepts.

### **UNIT-II: DIFFERENTIAL CALCULUS (Contd.)**

**15 Hrs**

Curvature, Radius of Curvature in Cartesian and Polar coordinates, p-r equation, Centre of Curvature.

### **UNIT-III: DIFFERENTIAL CALCULUS (Contd.)**

**15 Hrs**

Evolutes and Involutives - Asymptotes: Methods (without proof) of finding Asymptotes of rational algebraic curves with special cases

### **UNIT- IV: INTEGRAL CALCULUS**

**15 Hrs**

Reduction Formulae:  $\sin^n \theta$ ,  $\cos^n \theta$ ,  $\tan^n \theta$ ,  $\operatorname{cosec}^n \theta$ ,  $\sec^n \theta$ ,  $\cot^n \theta$ . -Jacobians -Beta and Gamma functions - properties and problems.

### **UNIT- V: INTEGRAL CALCULUS (Contd.)**

**15 Hrs**

Double Integrals- Triple Integrals- Application to Area, Surface Area and Volume.

**DISTRIBUTION OF MARKS: THEORY 5% AND PROBLEMS 95%**

### **TEXT BOOKS**

| <b>S.NO</b> | <b>AUTHORS</b>                            | <b>TITLE</b>         | <b>PUBLISHERS</b>                                       | <b>YEAR OF PUBLICATION</b>          |
|-------------|---|----------------------|---|-------------------------------------|
| 1           | S.Narayanan and T.K.Manickavachagompillay | Calculus Volume I,II | S.Viswanathan printers and publishers pvt.ltd – Chennai | volume I( 2007)<br>volume II( 2010) |

### **REFERENCE BOOKS**

| <b>S.NO</b> | <b>AUTHORS</b>             | <b>TITLE</b>          | <b>PUBLISHERS</b>                | <b>YEAR OF PUBLICATION</b> |
|-------------|----------------------------|-----------------------|----------------------------------|----------------------------|
| 1           | Shanthi Narayan            | Differential Calculus | Shymal charitable trust,Newdelhi | 2001                       |
| 2           | S.Sudha                    | Calculus              | Emerald publishers,chennai       | 1998                       |
| 3           | P.Kandasamy,K.Thilagavathy | Mathematics           | S,Chand& company                 | 2004                       |

|  |  |                                   |                  |  |
|--|--|-----------------------------------|------------------|--|
|  |  | for B.Sc<br>Volume<br>I,II,III,IV | ltd ,Newdelhi-55 |  |
|--|--|-----------------------------------|------------------|--|

## WEB SOURCES

1. <https://www.khanacademy.org/math/calculus-1>
2. <https://www.britannica.com/science/calculus-mayhematics>

## TEACHING METHODOLOGY

1. Class room teaching
2. Assignments
3. Discussions
4. Home Test
5. PPT presentation

## SYLLABUS DESIGNERS

Dr.K.AmeenAlBibi, Associate professor of Mathematics.

1. Mrs.V.Vandarkuzhali, Assistant professor of Mathematics.

## SOLID GEOMETRY

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| II       |              | Core     | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 4      |
|          |              |          | 4        | 60      | 4        | 60      |           |        |

## COURSE OBJECTIVES

- To deepen the knowledge of the students in various concept of Analytical Solid Geometry.
- To learn about Plane, Straight Line, Sphere, Cone and Cylinder

## COURSE OUTCOMES

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To study the concept of plane and apply the knowledge in solving problems | K1                      |
| CO2       | To learn the concept of straight line                                     | K3                      |
| CO3       | To find the equation of sphere  | K3                      |
| CO4       | To discuss the importance of cone   | K2                      |
| CO5       | To apply the concept of cylinder in various problems                      | K4                      |

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

## MAPPING OF COURSE OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | S   | S   |
| CO2 | S   | M   | S   | S   | S   | S   |
| CO3 | S   | S   | M   | M   | M   | M   |
| CO4 | S   | M   | M   | M   | M   | M   |
| CO5 | S   | S   | S   | M   | S   | M   |

*S- Strong      M – Medium      L – Low*

### UNIT I: PLANE

**12 Hrs**

General equation of a plane – Equation of a plane in the normal form – Angle between planes – Plane through three given points – Equation of a plane through the line of intersection of two planes.

### UNIT II: STRAIGHT LINE

**12 Hrs**

Symmetrical form of a straight line – Image of a point with respect to a plane – Image of a line with respect to a plane – Length and equation of the shortest distance between two skew lines - Coplanar lines.

### UNIT III: SPHERE

**12 Hrs**

Equation of the sphere – Length of the tangent – Tangent plane – Section of a sphere by a plane – Orthogonal spheres – Equation of a sphere through a given circle.

### UNIT IV: CONE

**12 Hrs**

Equation of a cone with a given vertex and a given guiding curve - Equation of a cone with its vertex at the origin - Condition for the general equation of the second degree to represent a cone - Right circular cone – Enveloping cone - Tangency of a plane to a cone.

### UNIT V: CYLINDER

**12 Hrs**

Equation of a cylinder with a given generator and a given guiding curve - Right circular cylinder - Enveloping cylinder – Enveloping cylinder as a limiting form of an enveloping cone.

**DISTRIBUTION OF MARKS: PROBLEMS 75 % AND THEORY 25%**

### TEACHING METHODOLOGY

1. Class room teaching
2. Giving Assignments for all units
3. Discussions
4. Home Test
5. PPT presentation

## TEXT BOOKS

| S.NO | AUTHORS               | TITLE                                   | PUBLISHERS           | YEAR OF PUBLICATION           |
|------|-----------------------|---|----------------------|-------------------------------|
| 1.   | S.G.Venkatachalapathy | Analytical Geometry                     | Margham Publications | 2008.(For Units I,II and III) |
| 2.   | P.DuraiPandian        | Analytical Geometry of Three Dimensions | Mugil Publishers     | Revised Edition, 1983         |

## REFERENCE BOOKS

| S.NO | AUTHORS    | TITLE   | PUBLISHERS           | YEAR OF PUBLICATION                                |
|------|------------|---|----------------------|--|
| 1.   | P.R.Vittal | Vector Analysis, Analytical Solid Geometry, Sequence and Series | Margham Publications | 3 <sup>rd</sup> Edition, 2003.(For Units IV and V) |

## WEB SOURCES

- 1.<https://www.brainkart.com/article/Three-Dimensional-Analytical-Geometry-6453>
- 2.<https://www.intmath.com/plane-analytic-geometry/intro.php>

## SYLLABUS DESIGNER

1. Dr.K.AmeenAlBibi, Associate Professor of Mathematics
2. Dr. M. Kasthuri, Assistant Professor of Mathematics

## ALLIED - MATHEMATICAL STATISTICS-II

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| II       |              | Allied   | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 4      |
|          |              |          | 4        | 60      | 4        | 60      |           |        |

## COURSE OBJECTIVES

- To impart knowledge in statistical concepts which includes Distribution, Sampling, Estimation and Test of Significance
- This course provides practical knowledge in the field of Mathematical Statistics.

## COURSE OUTCOMES

| CO Number | CO Statement | Knowledge Level(K1-K4) |
|-----------|--------------|------------------------|
|-----------|--------------|------------------------|

|            |  |    |
|------------|--|----|
| <b>CO1</b> | To understand the concepts of Distribution   | K2 |
| <b>CO2</b> | To acquire the knowledge about Sampling Distributions                              | K2 |
| <b>CO3</b> | To discuss about hypothesis , to analyse the largessamples and to draw conclusions | K3 |
| <b>CO4</b> | To analyse small samples and to draw conclusions                                   | K4 |
| <b>CO5</b> | To learn about the Estimation Theory   | K2 |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze*

### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>Cos</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | M          | S          | S          | S          | M          |
| <b>CO2</b> | M          | S          | S          | M          | S          | S          |
| <b>CO3</b> | S          | S          | S          | M          | S          | M          |
| <b>CO4</b> | S          | M          | S          | M          | M          | S          |
| <b>CO5</b> | S          | S          | S          | S          | M          | S          |

S- Strong:

M- Medium:

L- Low

### **UNIT – I : DISTRIBUTIONS**

**12 Hrs**

Discrete Distributions: Binomial, Poisson – Continuous Distributions: Normal Distributions.

### **UNIT – II :SAMPLING DISTRIBUTIONS**

**12 Hrs**

Student's 't' Distribution – Derivation of student's 't' distribution –Fisher's 't' – Distribution of Fisher's 't' – Constants of t-distribution – Limiting form of t-distribution - Chi-Square Distribution - Derivation of the Chi-Square Distribution – Moments Generating Function, Cumulant Generating Function, Limiting form of Chi-Square Distribution – Characteristic Function of Chi-Square Distribution – Mode and Skewness of Chi-Square Distribution - Additive property of Chi-Square Variates - F- distribution(without proof)- Constants, Mode and Points of inflexion of F-Distribution.

### **UNIT – III - TESTING OF LARGE SAMPLES**

**12 Hrs**

Test of Significance –Null and Alternative Hypothesis – Error in sampling – Critical Region and Level of Significance- One tailed and Two tailed tests – Critical Values –Procedure for Testing of Hypothesis - Test of significance for large samples - Sampling of Attributes – Test of significance for Single Proportion, Difference of Proportions – Standard Error for Sample Mean – Test of significance for Single Mean, Difference of Means, Difference of Standard Deviation.

### **UNIT – IV - TESTING OF SMALL SAMPLES**

**12 Hrs**

Application of t-Distribution – t-test for Single Mean, Difference of Means - Paired t-test for Difference of Means- Applications of Chi - Square Distribution – Inferences about a Population Variance – Goodness of Fit Test- Test of Independence of Attributes - Contingency tables-Yates's Correction (for 2×2 Contingency table) – Application of F- Distribution – F- test for Equality of Two Population Variances- Simple Problems

**UNIT – V –THEORY OF ESTIMATION****12 Hrs**

Characteristics of Estimators - Concept of Unbiasedness – Consistency – Efficient Estimators – Most Efficient Estimators – Sufficiency- Cramer –Rao Inequality –Method of Moments - Power of the test – Neymann Pearson lemma.

**DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%**

**TEXT BOOK**

| S.NO | AUTHORS                      | TITLE                                   | PUBLISHERS    | YEAR OF PUBLICATION |
|------|------------------------------|---|---------------|---------------------|
| 1.   | S. C. Gupta and V. K. Kapoor | Fundamentals of Mathematical Statistics | Sultan & Sons | 1971                |

**REFERENCE BOOKS**

| S.NO | AUTHORS                               | TITLE                                   | PUBLISHERS                 | YEAR OF PUBLICATION |
|------|---------------------------------------|---|----------------------------|---------------------|
| 1.   | Hogg, R. V. & Craig, A. T             | Introduction to Mathematical Statistics | Macmillan                  | 1998                |
| 2.   | Mood, A. M, Graybill, F. A & Boes, B. | Introduction to theory of statistics    | McGraw Hill                | 1974                |
| 3.   | Snedecor, G. W & Cochran, W. G        | Statistical Methods,                    | Oxford and IBH             | 1967                |
| 4.   | Hoel P. G                             | Introduction to Mathematical Statistics | Wiley                      | 1971                |
| 5.   | Wilks S. S                            | Elementary Statistics Analysis          | Princeton University Press | 2016                |
| 6    | Dr. S. P. Gupta                       | Statistical Methods                     | Sultan Chand & sons        | 2012                |

**WEB RESOURCES**

1. <https://www.e-booksdirectory.com/listing.php?category=413>
2. <https://www.textbooks.com/Catalog/MDL/Intermediate-and-Advanced-Statistics.php>

**TEACHING METHODOLOGY**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
5. PPT Presentations



## **SYLLABUS DESIGNERS**

1. Mrs.G. VinuPriya, Assistant Professor of Mathematics
2. Ms. R. Chithra, Assistant Professor of Mathematics

## **DEPARTMENT OF MATHEMATICS- PG**

### **M.Sc MATHEMATICS**

#### **PROGRAMME EDUCATIONAL OBJECTIVES (PEO):**

**PEO 1:** To develop problem-solving skills and apply them independently to problems in pure and applied mathematics.

**PEO 2:** To develop abstract mathematical thinking.

#### **PROGRAMME OUTCOMES (PO):**

**PO 1:** Apply knowledge of Mathematics, in all the fields of learning including higher research and its extensions.

**PO 2:** Innovate, invent and solve complex mathematical problems using the knowledge of pure and applied mathematics.

**PO 3:** Explain the knowledge of contemporary issues in the field of Mathematics and applied sciences.

**PO 4:** Work effectively as an individual, and also as a member or leader in multi-linguistic and multi- disciplinary teams. Adjust themselves completely to the demands of the growing field of Mathematics by lifelong learning.

**PO 5:** Effectively communicate about their field of expertise on their activities, with their peer and society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations.

**PO 6:** Crack lectureship and fellowship exams approved by UGC like CSIR – NET and SET.

**DEPARTMENT OF MATHEMATICS - PG****MASTER OF SCIENCE (MATHEMATICS)****(With effect from 2019-2020)**

| S.N<br>o     | Study Components    |               | Hrs/Week | Credi<br>t | Title of the<br>Paper   | Max. Marks |         |       |
|--------------|---------------------|---------------|----------|------------|---|------------|---------|-------|
|              | Course Title        |               |          |            |   | C.A        | Se<br>m | Total |
| SEMESTER I   |                     |               |          |            |   |            |         |       |
| 1            | Core                | Paper I       | 6        | 4          | Algebra - I   | 25         | 75      | 100   |
| 2            | Core                | Paper II      | 6        | 5          | Real<br>Analysis - I  | 25         | 75      | 100   |
| 3            | Core                | Paper III     | 6        | 5          | Ordinary<br>Differential<br>Equations                             | 25         | 75      | 100   |
| 4            | Core                | Paper IV      | 6        | 5          | Mechanics   | 25         | 75      | 100   |
| 5            | Elective<br>I       | Paper I       | 6        | 3          | Graph<br>Theory   | 25         | 75      | 100   |
| 6            | Self Study Paper    |               | -        | 2          | Skill<br>Enhanceme<br>nt            in<br>Algebra and<br>Analysis | -          | -       | -     |
| Total        |                     |               | 30       | 24         |   | 125        | 375     | 500   |
| SEMESTER II  |                     |               |          |            |   |            |         |       |
| 7            | Core                | Paper<br>V    | 5        | 4          | Algebra - II  | 25         | 75      | 100   |
| 8            | Core                | Paper<br>VI   | 6        | 5          | Real<br>Analysis - II   | 25         | 75      | 100   |
| 9            | Core                | Paper<br>VII  | 6        | 5          | Partial<br>Differential<br>Equations                              | 25         | 75      | 100   |
| 10           | Core                | Paper<br>VIII | 6        | 5          | Differential<br>Geometry  | 25         | 75      | 100   |
| 11           | Elective II         | Paper<br>II   | 5        | 3          | Operations<br>Research  | 25         | 75      | 100   |
| 12           | Compulsory<br>Paper |               | 2        | 2          | Human<br>Rights   | 25         | 75      | 100   |
|              | Total               |               | 30       | 24         |   | 150        | 450     | 600   |
| SEMESTER III |                     |               |          |            |   |            |         |       |
| 13           | Core                | Paper IX      | 6        | 4          | Complex   | 25         | 75      | 100   |

|             |                                      |            |    |    |                         |     |     |     |
|-------------|--------------------------------------|------------|----|----|-------------------------|-----|-----|-----|
|             |                                      |            |    |    | Analysis-I              |     |     |     |
| 14          | Core                                 | Paper X    | 6  | 5  | Calculus of Variations  | 25  | 75  | 100 |
| 15          | Core                                 | Paper I    | 6  | 5  | Topology                | 25  | 75  | 100 |
| 16          | Core                                 | Paper XII  | 6  | 5  | Probability Theory      | 25  | 75  | 100 |
| 17          | Elective III                         | Paper III  | 6  | 3  | Numerical Analysis      | 25  | 75  | 100 |
| 18          | Self Study Paper                     |            | -  | 2  | MATLAB                  | -   | -   | -   |
| Total       |                                      |            | 30 | 24 |                         | 125 | 375 | 500 |
| SEMESTER IV |                                      |            |    |    |                         |     |     |     |
| 19          | Main                                 | Paper XIII | 6  | 4  | Complex Analysis-II     | 25  | 75  | 100 |
| 20          | Main                                 | Paper XIV  | 6  | 5  | Mathematical Statistics | 25  | 75  | 100 |
| 21          | Main                                 | Paper XV   | 6  | 5  | Functional Analysis     | 25  | 75  | 100 |
| 22          | Elective IV                          | Paper IV   | 6  | 3  | Difference Equations    | 25  | 75  | 100 |
| 23          | Project with Viva Voce( Using Latex) |            | 6  | 5  | -                       | 25  | 75  | 100 |
| Total       |                                      |            | 30 | 22 |                         | 125 | 375 | 500 |

### CONSOLIDATED STATEMENT

| Subject          | Papers    | Hours      | Credit | Total Credits | Marks | Total marks |
|------------------|-----------|------------|--------|---------------|-------|-------------|
| Core             | 15        | 89         | 4-5    | 71            | 100   | 1500        |
| Elective         | 4         | 23         | 3      | 12            | 100   | 400         |
| Compulsory       | 1         | 2          | 2      | 2             | 100   | 100         |
| Project          | 1         | 6          | 5      | 5             | 100   | 100         |
| Self Study Paper | 2         | -          | 2      | 4             | -     | -           |
| <b>Total</b>     | <b>23</b> | <b>120</b> |        | <b>94</b>     |       | <b>2100</b> |

## ALGEBRA-I

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| I        |              | Core     | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 4      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

### COURSE OBJECTIVES

- To introduce the concept of class equation, solvability of groups, finite abelian groups, linear transformations and real quadratic forms.
- To develop the knowledge on trace and transpose, Jordan forms.

### COURSE OUTCOMES:

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To explain the Sylow's theorem  | K2                      |
| CO2       | To provide information on fields, vector spaces and modules                                       | K3                      |
| CO3       | To explain and evaluate the concept of canonical transformations such as triangular and nilpotent | K4                      |
| CO4       | To apply the Jordan form and rational canonical form for problem solving                          | K3                      |
| CO5       | To analyze the topics Trace, Transpose, Hermitian etc.  | K4                      |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

### MAPPING OF COURSE OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | M   | S   | M   |
| CO2 | M   | S   | M   | S   | M   | S   |
| CO3 | S   | M   | S   | M   | M   | S   |
| CO4 | S   | M   | M   | M   | M   | M   |
| CO5 | S   | S   | S   | M   | S   | M   |

S- Strong; M-Medium; L-Low

**UNIT - I - GROUP THEORY****18hrs**

Another Counting Principle –Class Equation for Finite groups and its applications – Sylow's theorems [For theorem 2.12.1, Only First proof].

**Chapter 2: Sections 2.11 and 2.12** [omit Lemma 2.11.3, 2.12.2, 2.12.5]

**UNIT - II - GROUPS****18hrs**

Direct products – Finite abelian groups – Modules

**Chapter 5: Section 5.7** [Lemma 5.7.1, Lemma 5.7.2 theorem 5.7.1]

**Chapter 2: Sections 2.13 and 2.14** [only theorem 2.14.1]

**Chapter 4: Section 4.5**

**UNIT-III: LINEAR TRANSFORMATIONS****18hrs**

Linear Transformations: Canonical forms- Triangular form- Nilpotent transformations.

**Chapter 6: Sections 6.4, 6.5**

**UNIT-IV: LINEAR TRANSFORMATIONS****18hrs**

Jordan form- rational canonical form, Trace and transpose

**Chapter 6: Sections 6.6, 6.7, 6.8**

**UNIT-V: LINEAR TRANSFORMATIONS****18hrs**

Hermitian, Unitary, Normal transformation, Real Quadratic forms.

**Chapter 6: Sections 6.10 and 6.11**[Omit 6.9]

**DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%.**

**TEXT BOOKS:**

| S.NO | AUTHORS      | TITLE             | PUBLISHERS                              | YEAR OF PUBLICATION |
|------|--------------|-------------------|---|---------------------|
| 1.   | I.N.Herstein | Topics in Algebra | Wesley Wiley Eastern Limited, New Delhi | 1975, II Edition    |

**REFERENCE BOOKS:**

| S.NO | AUTHORS                         | TITLE         | PUBLISHERS             | YEAR OF PUBLICATION |
|------|---------------------------------|---------------|------------------------|---------------------|
| 1    | M.Artin                         | Algebra       | Prentice Hall of India | 1991                |
| 2    | P.B.Bhattacharya, S.K.Jain, and | Basic Abstrat | Cambridge University   | 1997                |

|          |  |   |  |       |
|----------|--|---|--|-------|
|          | S.R.Nagpaul                                | Algebra   | Press                                      |       |
| <b>3</b> | Rudin, W I.S.<br>Luther and<br>I.B.S.Passi | . Algebra,<br>Vol. I-<br>Groups and<br>Vol.II Rings | Narosa<br>Publishing<br>House,New<br>Delhi | 1999. |

### Web Sources:

1. [abstact.ups.edu>aata-20160809](http://abstact.ups.edu>aata-20160809).

### Teaching Methodology

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

### SYLLABUS DESIGNER:

1. Mrs.G.Chitra, Assistant Professor of Mathematics.
2. Dr.M.Kasthuri, Assistant Professor of Mathematics.

### REAL ANALYSIS-I

| Semester | Subject Code | Category | Lecture      |             | Theory       |             | Practical | Credit |
|----------|--------------|----------|--------------|-------------|--------------|-------------|-----------|--------|
| I        |              | Core     | Hrs/<br>week | Hrs/<br>Sem | Hrs/<br>week | Hrs/<br>Sem | 0         | 5      |
|          |              |          | 6            | 90          | 6            | 90          |           |        |

### Course Objectives:

1. This course aims to provide students with the specialist knowledge necessary for basic concepts in Real Analysis. More precisely, it strives to enable students to learn basic concepts about functions of bounded variation, grasp basic concepts about the total variation, learn about Riemann-Stieltjes integrals, sequences and series of functions.
2. We introduce a stronger notion of convergence of functions than pointwise convergence, called uniform convergence. The difference between pointwise convergence and uniform convergence is analogous to the difference between continuity and uniform continuity.

**Course Outcomes:**

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| CO1              | We consider algebraic properties as well as more abstract properties such as realizing that every function of bounded variation can be written as the difference of two increasing functions.  | K4                             |
| CO2              | We examine the definition of the Riemann-Stieltjes integral and see when functions of bounded variation are Riemann-Stieltjes integrable.  | K2                             |
| CO3              | Both infinite series and infinite products could potentially be helpful in the area of approximation of functions. Infinite series represent a traditional instrument in contemporary mathematics. One of its classical implementations is the representation of functions, which is applicable to different areas of mathematical analysis. | K2                             |
| CO4              | The focus in the present volume is on just one of many possible implementations of infinite products, namely the representation of elementary functions.   | K2                             |
| CO5              | This chapter explores several ways that sequences of functions can converge to another function.   | K3                             |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

**Mapping of Program Outcomes:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | S          | S          | M          |
| <b>CO2</b> | M          | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | M          | S          | M          | S          | S          |
| <b>CO4</b> | M          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

S- Strong; M-Medium; L-Low

**UNIT- I - FUNCTIONS OF BOUNDED VARIATION****18 Hrs**

Introduction - Properties of monotonic functions - Functions of bounded variation - Total Variation - Additive property of total variation - Total variation on  $[a,x]$  as a function of  $x$  - Functions of bounded variation expressed as the difference of increasing functions - Continuous functions of bounded variation-Curves and paths-Additive and Continuity Properties of arc length-Equivalence of paths , Change of parameters.

**Section : 6.1 - 6.12****UNIT- II - THE RIEMANN- STIELTJES INTEGRAL****18 Hrs**

Introduction - Notation - The definition of the Riemann - Stieltjes integral - Linear properties - Integration by parts - Change of variable in a Riemann - Stieltjes integral - Reduction to a Riemann Integral - Euler's summation formula - Monotonically increasing integrators, Upper and lower integrals - Additive and linearity properties of upper and lower integrals - Riemann's condition - Comparison theorems.

**Section 7.1 - 7.7 and 7.10 - 7.14****UNIT - III - THE RIEMANN-STIELTJES INTEGRAL****18 Hrs**

Integrators of Bounded Variation - Sufficient conditions for existence of Riemann-Stieltjes Integrals- Necessary conditions for existence of Riemann-Stieltjes integrals - Mean value theorems for Riemann - Stieltjes integrals - The integral as a function of the interval - Second fundamental theorem of integral calculus - Change of variable in a Riemann integral - Second Mean Value Theorem for Riemann integrals - Riemann - Stieltjes Integrals depending on a parameter - Differentiation under the integral sign -Inter changing the order of Integration - Lebesgue's criterion for existence of Riemann integrals

**Section: 7.15 - 7.26****UNIT- IV - INFINITE SERIES AND INFINITE PRODUCTS****18 Hrs**

Double sequences - Double series - Rearrangement theorem for double series - A sufficient condition for equality of iterated series - Multiplication of series - Cesaro summability - Infinite products.

**Section: 8.16 - 8.26****UNIT- V- SEQUENCE OF FUNCTIONS****18 Hrs**

Point wise convergence of sequence of functions - Examples of sequences of real - Valued functions - Definition of uniform convergence - Uniform convergence and continuity - The Cauchy condition for uniform convergence - Uniform Convergence of infinite series of functions- Uniform convergence and Reimann - Stieltjes integration - Nonuniformly convergent sequence that can be integrated term by term- uniform convergence and Differentiation - Sufficient conditions for uniform convergence of a series - Mean convergence -Power Series - Multiplication of power series - The Taylor's series generated by a function- Bernstein's theorem- The binomial series - Abel's limit theorem - Tauber's theorem



**Section: 9.1 - 9.6 and 9.14 - 9.23****Distribution of Marks: Theory 100%****Text Books:**

| S.No | AUTHORS        | TITLE                 | PUBLISHERS                              | YEAR OF PUBLICATION |
|------|----------------|-----------------------|---|---------------------|
| 1    | Tom M. Apostol | Mathematical Analysis | Wesley Publishing Company Inc, New York | 1974                |

**Reference Books:**

| S.No | AUTHORS                   | TITLE                               | PUBLISHERS                      | YEAR OF PUBLICATION |
|------|---------------------------|-------------------------------------|---------------------------------|---------------------|
| 1    | Burkill, J.C              | The Lebesgue Integral               | Cambridge University Press      | 1951                |
| 2    | Munroe, M.E               | Measure and Integration             | Wesley, Mass                    | 1971                |
| 3    | Roydon, H.L               | Real Analysis                       | Company, New York               | 1988                |
| 4    | Rudin, W and Savita Arora | Principles of Mathematical Analysis | McGraw Hill Company, New York   | 1979.               |
| 5    | Malik, S.C                | Mathematical Analysis               | Wiley Eastern Limited, New York | 1991                |

**Web sources:**

4. <https://www.scribd.com/doc/19250862/Chap-07-Real-Analysis-Functions-of-Bounded-Variation>
5. <https://math.stackexchange.com/questions/206848/derivation-of-riemann-stieltjes-integral>
6. <http://www.springer.com/978-0-8176-8279-8>
7. <http://www.math.iitb.ac.in/~srg/courses/ma403-2008/uniconv.pdf>
5. <http://math.louisville.edu/~lee/ira/IntroRealAnal-ch09.pdf>

**TEACHING METHODOLOGY:**

1. Black Board Teaching
2. Smart Board Teaching
3. Giving Assignments in each Unit.
4. Class Room Discussion and Seminars.
5. PPT Presentations.

**SYLLABUS DESIGNERS**

1. K. Kavitha Assistant Professor of Mathematics
2. K Geetha Priya, Assistant Professor of Mathematics

## ORDINARY DIFFERENTIAL EQUATIONS

| Semester | Subject Code | Category | Lecture  |         | Theory | Practical | Credit |
|----------|--------------|----------|----------|---------|--------|-----------|--------|
|          |              |          | Hrs/Week | Hrs/Sem |        |           |        |
| I        |              | Core     | 6        | 90      | 6      | 0         | 5      |

### COURSE OBJECTIVES:

- To develop strong background on finding solutions to linear differential equations with constant and variable coefficients and also with singular points
- To study existence and uniqueness of the solutions of first order differential equations.

### COURSE OUTCOMES:

| CO Number | CO Statement   | Knowledge Level(K1-K4) |
|-----------|--|------------------------|
| CO1       | To obtain solutions of the Homogenous equation with constant co-efficient and Homogenous equation with analytic co-efficient and using Wronskian to find a solution of the problems. | K2                     |
| CO2       | To obtain the solution of Homogenous and Non-homogenous equation of order n and also to find the solution of non-homogenous equation using Annihilator method.                       | K3                     |
| CO3       | To solve Initial value problems and to derive the homogenous equation with analytic coefficient and also obtain the solution of Legendre equation and related problems.              | K4                     |
| CO4       | To comprehend the Euler equations, the Bessel equation and second order equations with regular singular points.  | K2                     |
| CO5       | To analyze the problems in Exact equation and method of convergence of the successive approximations and study about Lipschitz condition.  | K3                     |

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

### MAPPING WITH PROGRAMME OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | S   | M   | S   |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO2 | M | M | S | M | S | M |
| CO3 | S | S | S | M | S | S |
| CO4 | M | M | M | M | M | S |
| CO5 | S | M | S | S | S | M |

S- Strong; M- Medium; L- Low

### **UNIT I - LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS    18 hrs**

Second order homogeneous equations – Initial value problems – Linear dependence and independence – Wronskian and a formula for Wronskian – Non – homogeneous equation of order two.

**Chapter - 2: Sections 1 to 6.**

### **UNIT II - LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS    18 hrs**

Homogeneous and non – Homogeneous equation of order n – Initial value problems – Annihilator method to solve non – homogeneous equation – Algebra of constant coefficient operators.

**Chapter- 2: Sections 7 to 12.**

### **UNIT III - LINEAR EQUATIONS WITH VARIABLE COEFFICIENTS:    18 hrs**

Initial value Problems – Existence and uniqueness theorems – Solutions to solve a non – homogeneous equation – Wronskian and linear dependence – reduction of the order of a homogenous equation – homogeneous equation with analytic coefficients – The Legendre equation.

**Chapter- 3: Sections 1 to 8 [Omit Section 9]**

### **UNIT IV - LINEAR EQUATIONS WITH REGULAR SINGULAR POINTS: 18 hrs**

Euler equation – Second order equations with regular singular points – Exceptional cases – Bessel Function.

**Chapter – 4: Sections 1 to 4 and 6 to 8 [Omit sections 5 and 9 ]**

### **UNIT V - EXISTENCE AND UNIQUENESS OF SOLUTIONS TO FIRST ORDER EQUATIONS: 18 hrs**

Equation with variable separable – Exact equation – method of successive approximations – the Lipschitz condition – convergence of the successive approximations and the existence theorem.

**Chapter – 5: Sections 1 to 6 [ Omit sections 7 to 9 ].**

**DISTRIBUTION OF MARKS: THEORY 70% AND PROBLEMS 30%.**

**TEXT BOOK:**

| S.No | AUTHORS         | TITLE  | PUBLISHERS                                | YEAR OF PUBLICATION |
|------|-----------------|--|---|---------------------|
| 1    | E.A. Coddington | An Introduction to ordinary differential equations | Prentice – Hall of India Ltd., New Delhi, | 1987.               |

**REFERENCE BOOKS:**

| S.No. | AUTHORS                                   | TITLE   | PUBLISHERS                          | YEAR OF PUBLICATION |
|-------|---|---|-------------------------------------|---------------------|
| 1     | Williams E. Boyce and Richard C. Di Prima | Elementary differential equations and boundary value problems | John Wiley and sons, New York       | 1967                |
| 2     | George F Simmons                          | Differential equation with applications and historical notes  | Tata McGraw Hill, New Delhi         | 1974                |
| 3     | N.N. Lebedev                              | Special functions and their application                       | Prentice Hall of India, New Delhi   | 1965                |
| 4     | W.T. Reid                                 | Ordinary Differential Equations,                              | John Wiley and Sons, New York       | 1971                |
| 5     | M.D.Raisinghania                          | Advanced Differential Equations                               | S.Chand & Company Ltd. New Delhi    | 2001                |
| 6     | B.Rai, D.P.Choudary and H.I Freedman      | A Course in Ordinary Differential Equations,                  | Narosa Publishing House, New Delhi, | 2002                |

**WEB SOURCES:**

1.[http://www.amazon.com/Ordinary-differential-equation-Dover-Mathematics/dp/6486649407/ref=sr\\_1\\_1?](http://www.amazon.com/Ordinary-differential-equation-Dover-Mathematics/dp/6486649407/ref=sr_1_1?)

2.<https://open.umn.edu/open-text-books/text-books/Ordinary-differential-equation>

**TEACHING METHODOLOGY:**

1. Class room Teaching
2. Assignments
3. Seminars

4. Discussions

5 .PPT Presentations.

**SYLLABUS DESIGNER:**

1. B. Vijayalakshmi, Assistant Professor of Mathematics.

**MECHANICS**

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
|          |              |          | Hrs/Week | Hrs/Sem | Hrs/Week | Hrs/Sem |           |        |
| I        |              | Core     | 6        | 90      | 6        | 90      | 0         | 5      |

**COURSE OBJECTIVES:**

- To develop the knowledge of mechanical systems under generalized co-ordinates systems, virtual work, energy and momentum
- To study mechanics developed by Newton, Lagrange, Hamilton, Jacobi and theory of relativity due to Einstein

**COURSE OUTCOMES:**

| CO Number | CO Statement  | Knowledge Level(K1-K4) |
|-----------|---|------------------------|
| CO1       | To acquire the knowledge about configuration space, generalized co-ordinates and virtual work | K2                     |
| CO2       | To apply Lagrange's equation to solve complex mechanical problems in effective manner         | K3                     |
| CO3       | To explain the Hamiltonian formulation of a mechanical system                                 | K3                     |
| CO4       | To identify, explain and evaluate the Jacobi equation and separability                        | K4                     |
| CO5       | To analyze the Canonical transformations  | K4                     |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

**MAPPING WITH PROGRAMME OUTCOMES:**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | S   | S   | M   |
| CO2 | M   | S   | M   | S   | S   | M   |
| CO3 | S   | S   | M   | S   | M   | S   |
| CO4 | M   | M   | S   | S   | M   | S   |
| CO5 | M   | S   | S   | M   | S   | S   |

S- Strong, M – Medium, L - Low

**UNIT – I - MECHANICAL SYSTEMS****18 hrs**

The mechanical systems – Generalized co-ordinates – Constraints – Virtual work – Energy and Momentum

**Chapter 1: Section: 1.1 to 1.5****UNIT – II - LAGRANGE’S EQUATIONS****18 hrs**

Derivation of Lagrange’s equations – Examples – Integrals of motion.

**Chapter 2: Section: 2.1 to 2.3****UNIT – III - HAMILTON’S EQUATIONS****18 hrs**

Hamilton’s Principle – Hamilton’s equations – Other Variational Principle.

**Chapter 4: Section: 4.1 to 4.3****UNIT – IV - HAMILTON’S – JACOBI THEORY****18 hrs**

Hamilton’s Principle Function – Hamilton – Jacobi Equation – Separability

**Chapter 5: Section: 5.1 to 5.3****UNIT – V - CANONICAL TRANSFORMATION****18 hrs**

Differential forms and Generating functions – Special Transformations – Lagrange and Poisson brackets

**Chapter 6: Section: 6.1 to 6.3**

**DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%**

**TEXT BOOK:**

| S.NO | AUTHORS     | TITLE              | PUBLISHERS                        | YEAR OF PUBLICATION |
|------|-------------|--------------------|-----------------------------------|---------------------|
| 1.   | D.Greenwood | Classical Dynamics | Prentice Hall of India, New Delhi | 1985                |

**REFERENCE BOOKS:**

| S.NO | AUTHORS     | TITLE               | PUBLISHERS   | YEAR OF PUBLICATION |
|------|-------------|---------------------|--|---------------------|
| 1.   | H.Goldstein | Classical Mechanics | [2 <sup>nd</sup> edition] Narosa publishing house- New Delhi | -                   |

|    |                               |                        |                  |      |
|----|-------------------------------|------------------------|------------------|------|
| 2. | N.C.Rane<br>and<br>P.S.C.Joag | Classical<br>Mechanics | Tata McGraw Hill | 1991 |
|----|-------------------------------|------------------------|------------------|------|

#### WEB SOURCES:

1. <https://www.springer.com>journal>
2. <https://revisionmaths.com/advanced-level-maths-revision/advanced-level-mechanics>

#### TEACHING METHODOLOGY:

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

#### SYLLBUS DESIGNERS:

1. Mrs. V. Vandar Kuzhali , Assistant Professor Of Mathematics
2. Mrs. C. Revathi, Assistant Professor Of Mathematics

### GRAPH THEORY

#### COURSE OBJECTIVES:

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| I        |              | Elective | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 3      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

- Graph Theory is an integral part of Discrete Mathematics and has applications in diversified areas such as Electrical Engineering, Computer science, Linguistics.
- In this course basic concepts of Graph theory such as Trees, Eulerian Graphs, Matching, Vertex colorings, Edge colorings, Planarity, are introduced.

#### COURSE OUTCOMES:

| CO Number | CO Statement  | Knowledge Level<br>(K1-K4) |
|-----------|---|----------------------------|
| CO1       | To acquire the basic knowledge of graphs namely cut vertex , bridge, blocks of graph. | K2                         |

|     |  |    |
|-----|--|----|
| CO2 | To determine the properties of trees and connectivity      | K3 |
| CO3 | To justify Eulerian graphs and Hamiltonian graphs          | K3 |
| CO4 | To discuss the importance of Matchings and Colorings       | K4 |
| CO5 | To apply the concept of Planarity including Euler identity | K3 |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze*

#### **MAPPING OF PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| CO1        | S          | M          | S          | M          | S          | M          |
| CO2        | M          | S          | M          | M          | S          | M          |
| CO3        | S          | S          | M          | S          | M          | S          |
| CO4        | M          | M          | S          | S          | M          | S          |
| CO5        | M          | S          | S          | M          | S          | S          |

S- Strong; M-Medium; L-Low

#### **UNIT-I -GRAPHS, SUB GRAPHS AND TREES**

**18hrs**

Graph– graph isomorphism and simple graph - the Incidence and adjacency matrices- sub graph – vertex degrees- paths and connection – cycles –trees – cut edges and bonds – cut vertices.

##### **Chapter 1 [section 1.1 to 1.7]**

##### **Chapter 2 [section 2.1 to 2.3]**

#### **UNIT -II - CONNECTIVITY EULER’S TOURS AND HAMILTON CYCLES**

**18hrs**

Connectivity – Blocks – Euler tours – Hamilton cycles.

##### **Chapter 3 [section 3.1 to 3.2]**

##### **Chapter 4[section 4.1 to 4.2]**

#### **UNIT - III - MATCHINGS, EDGE COLORINGS**

**18hrs**

Matching’s- Matching’s and coverings in Bi partite graphs – Edge chromatic number – Vizing’s theorem.

##### **Chapter 5 [section 5.1 - 5.2]**

##### **Chapter 6 [section 6.1 - 6.2]**



**Unit – IV - INDEPENDENT SETS AND CLIQUES, VERTEX COLORINGS****18hrs**

Independent sets – Ramsey’s theorem- chromatic number – Brooks’ theorem – chromatic polynomials.

**Chapter 7[section 7.1 – 7.2]****Chapter 8 [section 8.1-8.2, 8.4]****Unit-V - PLANAR GRAPHS****18hrs**

Plane and planar graphs – dual graphs – Euler’s formula – the five color theorem and four color conjecture.

**Chapter 9 [section 9.1 – 9.3, 9.6]****DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%****TEXT BOOKS:**

| S.No | AUTHORS                    | TITLE                         | PUBLISHERS | YEAR OF PUBLICATION |
|------|----------------------------|-------------------------------|------------|---------------------|
| 1    | J.A Bondy and U.S.R Murthy | Graph theory and applications | McMillan   | 1976                |

**REFERENCE BOOKS:**

| S.No | AUTHORS                | TITLE                          | PUBLISHERS                 | YEAR OF PUBLICATION |
|------|------------------------|--------------------------------|----------------------------|---------------------|
| 1    | J.Clark and D.A Holton | A first look at Graph theory   | Allied publishers          | 1995                |
| 2    | R.Gould                | Graph theory                   | Benjamin Cummings          | 1989                |
| 3    | A.Gibbons              | Algorithmic Graph Theory       | Cambridge University Press | 1989                |
| 4    | R.J. Wilson            | Introduction to Graph Theory   | Pearson Education          | 2004                |
| 5    | S.A. Choudum           | A First Course in Graph Theory | MacMillan India Ltd        | 1987                |

**WEB SOURCES:**

1. <https://iversity.org/blog/introduction-graph-theory/>
2. <http://www.hamilton.ie/ollie/Downloads/Graph.pdf>

**TEACHING METHODOLOGY**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

**SYLLABUS DESIGNER:**

3. Mrs. R Ramya, Assistant Professor of Mathematics.
4. Mrs.G.Chitra, Assistant Professor of Mathematics.

**ALGEBRA-II**

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| II       |              | Core     | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 4      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

**COURSE OBJECTIVES**

- To study field extension, roots of Polynomial, Galois Theory, finite fields.
- Division rings, solvability by radical and to develop computational skill in abstract algebra

**COURSE OUTCOMES:**

| CO Number  | CO Statement   | Knowledge Level (K1-K4) |
|------------|--|-------------------------|
| <b>CO1</b> | To introduce the concept of Extension fields and Transcendence of e.                 | K3                      |
| <b>CO2</b> | To explain the relation between Roots of polynomials                                 | K2                      |
| <b>CO3</b> | To construct the Elements of Galois Theory   | K3                      |
| <b>CO4</b> | To discuss and understand the Wedderburn's theorem on finite division rings          | K2                      |
| <b>CO5</b> | To analyze the concept of Solvability by radicals, Integral Quaternions and the Four | K4                      |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

**MAPPING WITH PROGRAMME OUTCOMES:**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | M   | S   | M   |
| CO2 | M   | S   | M   | M   | S   | M   |
| CO3 | S   | S   | M   | S   | M   | S   |
| CO4 | M   | M   | S   | S   | M   | S   |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO5 | M | S | S | M | S | S |
|-----|---|---|---|---|---|---|

S- Strong; M-Medium; L-Low

### **UNIT- I: FIELDS**

**18hrs**

Extension fields – Transcendence of  $e$  – Roots of polynomials.

**Chapter 5: Section 5.1 - 5.3.**

### **UNIT-II: POLYNOMIALS**

**18hrs**

More about roots – Elements of Galois Theory.

**Chapter 5: Section 5.5 and 5.6**

### **UNIT-III: SOLVABILITY AND EXTENSION FIELDS**

**18hrs**

Solvability by radicals – Galois Groups over the Rationals.

**Chapter 5: Section 5.7 and 5.8**

### **UNIT- IV: FINITE FIELDS**

**18 hrs**

Finite fields – Wedderburn's theorem on finite division rings.

**Chapter 7: Section 7.1 and 7.2**

### **UNIT- V: SELECTED TOPICS**

**18hrs**

A theorem of Frobenius – Integral Quaternions and the Four – Square theorem.

**Chapter 7: Section 7.3 and 7.4**

**DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%**

**TEXT BOOK:**

| <b>S.NO</b> | <b>AUTHORS</b> | <b>TITLE</b>                    | <b>PUBLISHERS</b>     | <b>YEAR OF PUBLICATION</b> |
|-------------|----------------|---------------------------------|-----------------------|----------------------------|
| 1.          | I.N.Herstein   | Topics in Algebra ( II Edition) | Wiley Eastern Limited | 1975                       |

**REFERENCE BOOKS:**

| <b>S.NO</b> | <b>AUTHORS</b>                              | <b>TITLE</b>           | <b>PUBLISHERS</b>      | <b>YEAR OF PUBLICATION</b> |
|-------------|---|------------------------|------------------------|----------------------------|
| 1.          | M. Artin                                    | Algebra                | Prentice Hall of India | 1991                       |
| 2.          | P.B.Bhattacharya, S.K.Jain, and S.R.Nagpaul | Basic Abstract Algebra | Cambridge University.  | 1997                       |

**WEB SOURCES:**

1. [http://lib1.org/\\_ads/680A08FE3A43250BF4683E477AB1997A](http://lib1.org/_ads/680A08FE3A43250BF4683E477AB1997A)
2. [http://lib1.org/\\_ads/8F9FA5C07895D22659815E5D415E3C84](http://lib1.org/_ads/8F9FA5C07895D22659815E5D415E3C84)

**TEACHING METHODOLOGY**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

**SYLLABUS DESIGNER:**

1. Mrs.G.Chitra, Assistant Professor of Mathematics.
2. Ms.S.Santhiya, Assistant Professor of Mathematics.

**REAL ANALYSIS – II**

| Semester | Subject Code | Category | Lecture  |             | Theory       |             | Practical | Credit |
|----------|--------------|----------|----------|-------------|--------------|-------------|-----------|--------|
| II       |              | Core     | Hrs/week | Hrs/<br>Sem | Hrs/<br>week | Hrs/<br>Sem | 0         | 5      |
|          |              |          | 6        | 90          | 6            | 90          |           |        |

**COURSE OBJECTIVES**

- To introduce the concept of sequences and series of functions, Lebesgue measure and Lebesgue integration and to have a working knowledge on Multi-variable calculus.
- Measure on the real line, Lebesgue measurability and integrability, Fourier Series and Integrals.

**COURSE OUTCOMES:**

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | This course will develop an appreciation of the basic concepts of measure theory. Able to learn advanced the Lebesgue measure and Lebesgue integral with related | K2                      |

|     |   |    |
|-----|---|----|
|     | problems.   |    |
| CO2 | Demonstrate understanding of the statement and proofs to Study the Stone-Weierstrass theorem and its applications.  | K3 |
| CO3 | To understanding of the basic concepts underlying the definition of the general Lebesgue integral and Apply the theory of the course to solve a variety of problems at an appropriate level of difficulty | K2 |
| CO4 | To Describe the Riemann integral and convergence of measure.  | K3 |
| CO5 | To Apply the concept of Mean-value theorem for differentiable functions.  | K4 |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

#### **MAPPING OF COURSE OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| CO1        | S          | S          | M          | M          | S          | M          |
| CO2        | M          | S          | M          | S          | M          | S          |
| CO3        | S          | S          | S          | M          | M          | S          |
| CO4        | S          | M          | M          | M          | M          | M          |
| CO5        | S          | S          | S          | S          | S          | M          |

S- Strong; M-Medium; L-Low

#### **UNIT- I - THE LEBESGUE INTEGRAL**

**18hrs**

Introduction – The integral of a step function – Monotonic sequences of step functions – Upper functions and their integrals – Riemann integrable functions as examples of upper functions – The class of Lebesgue - integrable functions on a general interval – Basic properties of the Lebesgue integral - Lebesgue integration and sets of measure zero- The Levi monotone convergence theorems- The Lebesgue dominated convergence theorem – Lebesgue integrals on unbounded interval as limits of integrals as limits of integral on bounded intervals- Improper Riemann integrals.

#### **Chapter 10: section 10.1 to 10.13**

#### **UNIT- II - MEASURES THEORY AND INTEGRATION**

**18hrs**

Measurable functions – Continuity of function defined by Lebesgue integrals- Differentiation under the integral sign – Interchanging the order of integration- Measurable sets on the real line – The

Lebesgue integral over arbitrary subsets of  $\mathbb{R}$  – Lebesgue integrals of complex-valued functions – Inner products and norms – The set  $L^2(I)$  of square-integrable functions – The sets  $L^2(I)$  as a semimetric space – A convergence theorem for series of functions in  $L^2(I)$  – The Riesz-Fischer theorem.

**Chapter 10: Sec 10.14 to 10.25**

**UNIT - III-FOURIER SERIES AND FOURIER INTEGRALS**

**18hrs**

Introduction – Orthogonal system of functions – The theorem on best approximation – The Fourier series of function relative to an orthonormal system – Properties of Fourier Coefficients – The Riesz – Fischer Theorem – The convergence and representation problems in trigonometric series – The Reimann – Lebesgue Lemma – The Dirichlet Integrals – An Integral representation for the partial sums of Fourier series – Reimann's localization theorem- Sufficient conditions for convergence of a Fourier Series at a particular point – Cesaro summability of Fourier series – Consequences of Fejer's theorem – The Weierstrass approximation theorem.

**Chapter 11: Section 11.1 to 11.15**

**UNIT- IV - MULTIVARIABLE DIFFERENTIAL CALCULUS**

**18hrs**

Introduction – The Directional derivative – Directional derivatives and continuity – The total derivative – The total derivative expressed in terms of partial derivatives – An application to complex-valued functions- The matrix of linear function – The Jacobian matrix – The chain rule – Matrix form of chain rule – The Mean – value Theorem for differentiable functions – A sufficient condition for differentiability – A sufficient condition for equality of mixed partial derivatives – Taylor's Formula for functions of  $\mathbb{R}^n$  to  $\mathbb{R}^1$

**Chapter 12: Section 12.1 to 12.14**

**UNIT- V - IMPLICIT FUNCTIONS AND EXTREMUM PROBLEMS**

**18 hrs**

Introduction-Functions with nonzero Jacobian determinant – The inverse function theorem – The Implicit function Theorem – Extrema of real valued functions of one variable- Extrema of real valued functions of several variables – Extremum problems with side conditions

**Chapter 13: Section 13.1 to 13.7**

**DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%**

**TEXT BOOK:**

| S.NO | AUTHORS        | TITLE                 | PUBLISHERS | YEAR OF PUBLICATION |
|------|----------------|-----------------------|------------|---------------------|
| 1.   | Tom M. Apostol | Mathematical Analysis | Wesley     | 1974                |

**REFERENCE BOOKS:**

| S.NO | AUTHORS                      | TITLE                                 | PUBLISHERS                 | YEAR OF PUBLICATION |
|------|------------------------------|---------------------------------------|----------------------------|---------------------|
| 1    | Burkill, J.C.                | The Lebesgue Integral                 | Cambridge University Press | 1951.               |
| 2    | Malik, S.C. and Savita Arora | Mathematical Analysis                 | Wiley Eastern Limited      | 1991.               |
| 3    | Rudin, W                     | . Principles of Mathematical Analysis | McGraw Hill Company        | 1979.               |

**WEB SOURCES:**

1. <https://www.iiserkol.ac.in/Measure-Integration-notes.pdf>
2. [https://www.amazon.in/Lebesgue Integration-notes.pdf](https://www.amazon.in/Lebesgue-Integration-notes.pdf)

**TEACHING METHODOLOGY**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

**SYLLABUS DESIGNER:**

1. Ms.K.Geetha priya, Assistant Professor of Mathematics
2. Mrs.K.Kavitha, Assistant Professor of Mathematics

**PARTIAL DIFFERENTIAL EQUATIONS**

| Semester | Subject Code | Category | Lecture  |         | Theory | Practical | Credit |
|----------|--------------|----------|----------|---------|--------|-----------|--------|
|          |              |          | Hrs/Week | Hrs/Sem |        |           |        |
| I        |              | Core     | 6        | 90      | 6      | 0         | 5      |

**COURSE OBJECTIVES:**

- This course aims to acquaint the students with various mathematical techniques viz. Variable separable method, integral transform techniques
- Using Green's function approach so as to solve various boundary value problems involving parabolic, elliptic and hyperbolic differential equations which arise in many physical situations.

**COURSE OUTCOMES:**

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level(K1-K4)</b> |
|------------------|---|-------------------------------|
| CO1              | To obtain solutions of the partial differential equation in integral surfaces, orthogonal surfaces, compatible system, charpit method and canonical forms of partial differential equation. | K2                            |
| CO2              | To derive laplace and poisson equation, dirichlet and newmann problem for various co-ordinates.   | K3                            |
| CO3              | To obtain and form a solution of diffusion equation in cylindrical and spherical co-ordinates.  | K4                            |
| CO4              | To Comprehend the initial value problem and boundary value problem for two-dimensional wave equation and duhamel's Principle.   | K2                            |
| CO5              | To analyze the problems in green's Function for laplace equation, wave and diffusion equation.  | K3                            |

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

**MAPPING OF COURSE OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| CO1        | S          | M          | M          | S          | M          | S          |
| CO2        | M          | M          | S          | M          | S          | M          |
| CO3        | S          | S          | S          | M          | S          | S          |
| CO4        | M          | M          | M          | M          | M          | S          |
| CO5        | S          | M          | S          | S          | S          | M          |

S- Strong; M- Medium; L- Low

**UNIT I - PARTIAL DIFFERENTIAL EQUATIONS OF FIRST ORDER 18hrs**

Formation and solution of PDE – Integral surfaces – Cauchy problem order equation – Orthogonal surfaces – First order non – linear – Characteristics – Compatible system – Charpit method. Fundamentals: Classification and canonical forms of PDE.



**Chapter 0: 0.4 to 0.11 [Omit 0.1, 0.2, 0.3 and 0.11.1] and Chapter 1: 1.1 to 1.5**

**UNIT II - ELLIPTIC DIFFERENTIAL EQUATIONS**

**18hrs**

Derivation of Laplace and Poisson equation – BVP – Separation of Variables – Dirichlet's Problem and Neumann problem for a rectangle – Interior and exterior Dirichlet's problems for a circle – Interior Neumann problem for a circle – solution of Laplace equation in Cylindrical and spherical coordinates.

**Chapter 2: 2.1, 2.2, 2.5 to 2.12 [omit 2.3, 2.4 and 2.13]**

**UNIT III - PARABOLIC DIFFERENTIAL EQUATIONS**

**18hrs**

Formation and solution of Diffusion equation – Dirac – Delta function- Separation of variables method – Solution of Diffusion Equation in Cylindrical and spherical coordinates.

**Chapter 3: 3.1 to 3.7 [omit 3.8 and 3.9]**

**UNIT IV - HYPERBOLIC DIFFERENTIAL EQUATIONS**

**18hrs**

Formation and solution of one – dimensional wave equation – canonical reduction – IVP – D'Alembert's solution – Vibrating string — IVP and BVP for two – dimensional wave equation – Periodic solution of one- dimensional wave equation in cylindrical and spherical coordinates systems – vibration of circular membrane – Uniqueness of the solution for the wave equation – Duhamel's Principle – Examples.

**Chapter 4: Section 4.1 to 4.12 [omit 4.6 and 4.13]**

**UNIT V - GREEN'S FUNCTION**

**18hrs**

Green's function for Laplace Equation – methods of Images – Eigen function method – Green's function for the Wave and Diffusion equations. Laplace Transform Method : Solution of Diffusion and Wave equation by Laplace transform.

**Chapter 5: 5.1 to 5.6 Chapters 6: only 6.13, 6.13.1 and 6.13.2 [omit 6.14]**

**DISTRIBUTION OF MARKS: THEORY 70% AND PROBLEMS 30%.**

**TEXT BOOK:**

| S.No | AUTHORS       | TITLE  | PUBLISHERS   | YEAR OF PUBLICATION |
|------|---------------|--|--|---------------------|
| 1    | S. Sankar Rao | Introduction to partial differential equations | 2 <sup>nd</sup> Edition<br>Prentice Hall of India, New Delhi | 2005                |

**REFERENCE BOOKS:**

| S.No. | AUTHORS           | TITLE  | PUBLISHERS                       | YEAR OF PUBLICATION |
|-------|-------------------|--|----------------------------------|---------------------|
| 1     | R.C. Mc Owen      | partial differential equations   | McGraw Hill New Delhi            | 2005.               |
| 2     | I.N. Snedden      | Elements of Partial Differential Equations                                 | McGraw Hill New Delhi, 1983.     | 1983                |
| 3     | R. Dennemeyer,    | Introduction to Partial Differential Equations and Boundary Value Problems | McGraw Hill, New York, 1968.     | 1968                |
| 4     | M.D. Raisinghania | Advanced Differential Equations,   | S.Chand & Company LTD, New Delhi | 2001                |

**WEB SOURCES:**

1. <http://www.math.toronto.edu/ivrii/PDE-textbook/>
2. <https://www.math.ust.hk/~machas/differential-equation.pdf>

**TEACHING METHODOLOGY:**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

**SYLLABUS DESIGNER:**

1. B. Vijayalakshmi, Assistant Professor of Mathematics.

## DIFFERENTIAL GEOMETRY

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| II       |              | Core     | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 5      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

### COURSE OBJECTIVES

- This course introduces space curves and their intrinsic properties of a surface and geodesics.
- The non – intrinsic properties of surface and the differential geometry of surfaces are explored.

### COURSE OUTCOMES:

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | To acquire knowledge on the concept of Space Curves  | K2                      |
| CO2       | To understand the intrinsic properties of Surfaces   | K2                      |
| CO3       | To study the concept of Geodesics and its properties   | K3                      |
| CO4       | To understand and discuss the importance of the concepts non intrinsic properties of surface | K4                      |
| CO5       | To analyze the surface theory  | K4                      |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

### MAPPING WITH PROGRAMME OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | M   | S   | M   |
| CO2 | M   | S   | M   | M   | S   | M   |
| CO3 | S   | S   | M   | S   | M   | S   |
| CO4 | M   | M   | S   | S   | M   | S   |
| CO5 | M   | S   | S   | M   | S   | S   |

S- Strong; M- Medium; L- Low

**UNIT – I - SPACE CURVES****18 hrs**

Definition of a space curve – Arc length – Tangent – Normal and Binormal – Curvature and torsion – contact between curves and surfaces – Tangent surface – Involutives and evolutes – Intrinsic equations – Fundamental Existence Theorem for Space curves – Helices.

**Chapter 1: Section 1 to 9.****UNIT –II - INTRINSIC PROPERTIES OF A SURFACE****18 hrs**

Definition of a surface – Curves on surface – Surface of revolution – Helicoids – metric – Direction coefficients – Families of curves – Isometric correspondence – Intrinsic properties.

**Chapter 2: sections 1 to 9.****UNIT –III – GEODESICS****18 hrs**

Geodesics – Canonical geodesic equation – Normal property of geodesics – Existence theorem – geodesics parallels – geodesics Curvature-Gauss-Bonnet Theorem- Gaussian curvature –Surface of constant curvature.

**Chapter 2: sections 10 to 18.****UNIT –IV - NON INTRINSIC PROPERTIES OF A SURFACE****18 hrs**

The second fundamental form – Principal curvature – Lines of curvature – Developable – Developable associated with space curves and with curves on surface – Minimal surfaces –Ruled surfaces.

**Chapter 3: sections 1 to 8.****UNIT – V - DIFFERENTIAL GEOMETRY OF SURFACES****18 hrs**

Fundamental equations of surface theory – Fundamental Existence theorem for surfaces – Compact surfaces whose points are umbilics – Hilbert's lemma – Compact surface for constant curvature – Complete surfaces.

**Chapter 3: sections 9 and 10.****Chapter 4: sections 1 to 5.****DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS: 10%****TEXT BOOKS:**

| S.NO | AUTHORS     | TITLE                                    | PUBLISHERS              | YEAR OF PUBLICATION |
|------|-------------|--|-------------------------|---------------------|
| 1.   | T.J.Wilmore | An Introduction to Differential Geometry | Oxford University Press | 2012                |

**REFERENCE BOOKS:**

| S.NO | AUTHORS         | TITLE                                      | PUBLISHERS                           | YEAR OF PUBLICATION |
|------|-----------------|--|--------------------------------------|---------------------|
| 1.   | J.A. Thorpe     | Elementary Topics in Differential Geometry | Springer                             | 1994                |
| 2.   | D. Somasundaram | Differential Geometry                      | Alpha Science International Limited. | 2005                |

**WEB SOURCES:**

1. [www.pmp-book.org/download/slides/Differential\\_Geometry.pdf](http://www.pmp-book.org/download/slides/Differential_Geometry.pdf)
2. <https://mgarland.org/class/geometry/topics/diffgeom.pdf>

**TEACHING METHODOLOGY**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

**SYLLABUS DESIGNER:**

1. Mrs.G.Chitra, Assistant Professor of Mathematics.

**OPERATIONS RESEARCH**

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| I        |              | Elective | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 3      |
|          |              |          | 5        | 75      | 5        | 75      |           |        |

**COURSE OBJECTIVES:**

- This course aims to introduce decision theory, PERT, CPM, deterministic and probabilistic inventory systems.

- Introduced Queueing Theory, Replacement and maintenance problems.

### COURSE OUTCOMES:

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | To introduce decision theory, essential elements, certainty and uncertainty with problems. | K2                      |
| CO2       | To apply PERT and CPM techniques for solving real world problems.                          | K3                      |
| CO3       | To analyze inventory systems such as deterministic and probabilistic.                      | K4                      |
| CO4       | To explain queueing theory and its applications.   | K2                      |
| CO5       | To identify, explain and evaluate the replacement and maintenance problems.                | K4                      |

*Knowledge Level: K1 – Remember; K2 –Understand; K3 – Apply; K4 – Analyze*

### MAPPING OF PROGRAMME OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | M   | S   | M   |
| CO2 | M   | S   | M   | M   | S   | S   |
| CO3 | S   | M   | S   | S   | S   | S   |
| CO4 | S   | M   | M   | S   | M   | S   |
| CO5 | M   | S   | S   | M   | S   | M   |

S- Strong; M-Medium; L-Low

### UNIT -I - DECISION THEORY

**15 Hrs**

Steps in Decision theory Approach – Types of Decision-Making Environments – Decision Making Under Uncertainty – Decision Making under Risk – Posterior Probabilities and Bayesian Analysis – Decision Tree Analysis.

#### Chapter 11: 11.1 to 11.7

### UNIT - II - PROJECT MANAGEMENT: PERT AND CPM

**15 Hrs**

Basic Differences between PERT and CPM – Steps in PERT/ CPM Techniques –PERT / CPM Network Components and Precedence Relationships – Critical path Analysis – Probability in PERT Analysis – Project time – cost Trade off – Updating the Project.

#### Chapter 13: 13.1 to 13.9

**UNIT - III - DETERMINISTIC INVENTORY CONTROL MODELS 15 Hrs**

Meaning of Inventory control – Functional Classification – Advantage of Carrying Inventory – Features of Inventory System – Inventory Model building – Deterministic Inventory Models with no shortage – Deterministic Inventory Models with Shortages.

**Chapter 14: 14.1 to 14.8****UNIT – IV - QUEUEING THEORY****15 Hrs**

Essential Features of Queuing System – Operating Characteristic of Queuing System – Probabilistic Distribution in Queuing Systems Classification of Queuing Models – Solution of Queuing Models - Probability Distribution of Arrivals and Departures.

**Chapter 16: 16.1 to 16.8 and 16.A****UNIT - V - REPLACEMENT AND MAINTENANCE MODELS****15 Hrs**

Failure Mechanism of items – Replacement of Items Deteriorates with Time – Replacement of items that fail completely – other Replacement Problems

**Chapter 17: 17.1 to 17.5****DISTRIBUTION OF MARKS: THEORY 50% AND PROBLEMS 50%****TEXT BOOK:**

| S.No | AUTHORS     | TITLE               | PUBLISHERS       | YEAR OF PUBLICATION |
|------|-------------|---------------------|------------------|---------------------|
| 1    | J.K. Sharma | Operations Research | Mac Millan India | 2001                |

**REFERENCE BOOKS:**

| S.No | AUTHORS                               | TITLE                               | PUBLISHERS                             | YEAR OF PUBLICATION |
|------|---------------------------------------|-------------------------------------|--|---------------------|
| 1    | F.S. Hillier and J.Lieberman          | Introduction to Operation Research  | Tata McGraw Hill Publishing Company    | 2006                |
| 2    | Beightler. C, D. Phillips, B. Wilde   | Foundations of Optimization         | Prentice Hall Pvt Ltd                  | 1979                |
| 3    | Bazaraa, M.S; J.J.Jarvis, H.D.Sharall | Linear Programming and Network flow | John Wiley and sons                    | 1990                |
| 4    | Gross, D and C.M. Harris              | Fundamentals of Queuing Theory      | Wiley and Sons, New York               | 1998                |
| 5    | Hamdy A.Taha                          | Operations Research                 | Prentice-Hall of India Private Limited | 2001                |

**WEB SOURCES:**

1. <https://www.goodreads.com/shelf/show/operations-research>
2. <https://www.scribd.com/document/337754670/Operations-Research-Problems-and-Solutions-JK-Sharma>

## TEACHING METHODOLOGY

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

## SYLLABUS DESIGNER:

1. Mrs. R Ramya, Assistant Professor of Mathematics.

## SKILL ENHANCEMENT IN ALGEBRA AND ANALYSIS

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| II       |              | Optional | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 2      |
|          |              |          | -        | -       | -        | -       |           |        |

## COURSE OBJECTIVES

- To prepare the students to develop the in- depth knowledge in Algebra and Analysis.
- To Crack lectureship and fellowship exams approved by UGC like CSIR – NET and SET.

## COURSE OUTCOMES:

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To study the concept of Group Theory.   | K2                      |
| CO2       | To acquire the knowledge of permutations.   | K3                      |
| CO3       | To understand and analyze the concept of Rings and fields.                                      | K4                      |
| CO4       | To develop knowledge about set theory and real number system.                                   | K4                      |
| CO5       | To develop and apply complex number and analytic function in finding solutions to the problems. | K4                      |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

## MAPPING OF COURSE OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
|-----|-----|-----|-----|-----|-----|-----|



|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | S | M | M | M | S | M |
| CO2 | M | S | M | S | M | S |
| CO3 | S | M | S | M | M | S |
| CO4 | S | M | M | M | M | M |
| CO5 | S | S | S | M | S | M |

S- Strong; M-Medium; L-Low

### UNIT I: Groups

Introduction to Groups – Sub Groups – Coset - Ablian Group - Normal Sub Groups - Cyclic Groups.Quotient Groups - Direct Products - Some important Groups - Homomorphism - Normalizer of Subgroups - Centralizer of an Element or Normalizer of an Element - Commutator Subgroups – Fundamental theorem of Finite Abelian groups – Number of Non isomorphic Ablian Groups - Sylows theorem.

### UNIT II: Permutations

Permutations – Symmetric Group  $S_n$  – Alternating Group  $A_n$  – Conjugacy Classes and Conjugacy Relation.

### UNIT III: Rings and Fields

Rings-Ideals, Prime and maximal ideals,Quotient Rings, Fields,Finite Fields-Field Extensions-Galois Theory

### UNIT IV: Set theory and Real Number System

Elementary Set Theory – Finite Countable and Uncountable Sets – Real number system as a complete ordered field –Archimedean property-Supremum-Infimum-Sequence and series-convergence- limit sup-limit inf-Bolzano Weirstrass theorem- Heine Boral theorem

### UNIT V: Complex Number and Analytic functions

Algebra and complex numbers- The complex plane –polynomials-power series-Transcendental functions such as Exponential, Trigonometry and Hyperbolic and function –Analytic function.

### TEXT BOOKS:

| S.NO | AUTHORS      | TITLE             | PUBLISHERS                              | YEAR OF PUBLICATION |
|------|--------------|-------------------|---|---------------------|
| 1.   | I.N.Herstein | Topics in Algebra | Wesley Wiley Eastern Limited, New Delhi | 1975, II Edition    |
| 2.   | Walter Rudin | Real Analysis     | Narosa Publishing House,New Delhi       | 1999.               |

### REFERENCE BOOKS:

| S.NO | AUTHORS | TITLE   | PUBLISHERS             | YEAR OF PUBLICATION |
|------|---------|---------|------------------------|---------------------|
| 1    | M.Artin | Algebra | Prentice Hall of India | 1991                |

|          |   |                              |                                  |      |
|----------|---|------------------------------|----------------------------------|------|
| <b>2</b> | P.B.Bhattacharya,<br>S.K.Jain, and<br>S.R.Nagpaul | Basic<br>Abstract<br>Algebra | Cambridge<br>University<br>Press | 1997 |
|----------|---|------------------------------|----------------------------------|------|

#### **SYLLABUS DESIGNER:**

1. Mrs. G.Chitra , Assistant Professor of Mathematics

### **DEPARTMENT OF MATHEMATICS – ALLIED**

### **DEPARTMENT OF MANAGEMENT STUDIES**

### **B.Sc (ISM)**

#### **PROGRAMME EDUCATIONAL OBJECTIVES**

**PEO1.** To Provide a thorough understanding of how organizations and societies use and exploit new information technologies and excellent preparation for a career in information systems management or management consultancy specializing in it.

**PEO2.** To provide a strong business related base of core modules, but includes techniques and applications focused on Information systems and management, to operationalize the conceptual framework and build the competencies of an excellent and rounded business practitioner, in a highly technological environment.

#### **PROGRAMME OUTCOME**

**PO1:** Students able to create business reports that effectively communicate business strategies, practices, and goals using emerging technology and management theories.

**PO2:** Design a solution to a business dilemma, incorporating management practices and theories with the principles of marketing, economics, accounting, operations management, and finance.

**PO3:** Students Analyze business requirements to determine appropriate information systems solutions using current and emerging technologies.

**PO4:** The information systems curriculum prepares students for a position as decision support specialist, information systems specialist and system analysts.

**PO5:** To provide students to demonstrate mastery of information technology skills and techniques needed to enable individuals and organizations to strategically compete in the domestic and international marketplace

**PO6 :** To prepare Students to exploit opportunities being newly created in the management profession.

# DEPARTMENT OF MANAGEMENT STUDIES

## B.SC (ISM)

### SEMESTER- I

| S.NO | PART | COURSE TITLE       | SUBJECT CODE | Ins/Hrs | Credit | Title of the paper               | MAXIMUM MARKS |          |       |
|------|------|--------------------|--------------|---------|--------|----------------------------------|---------------|----------|-------|
|      |      |                    |              |         |        |                                  | CIA           | UNI.EXAM | TOTAL |
| 1    | I    | Language - I       |              | 6       | 4      | Tamil – I / Other language       | 25            | 75       | 100   |
| 2    | II   | English – I        |              | 6       | 4      | English – I                      | 25            | 75       | 100   |
| 3    | III  | Core paper – I     |              | 6       | 4      | Basics of Information Technology | 25            | 75       | 100   |
| 4    | III  | Core practical - I |              | 3       | 3      | Office Automation Lab            | 40            | 60       | 100   |
| 5    | III  | Allied paper – I   |              | 7       | 5      | Principles of management         | 25            | 75       | 100   |
| 6    | IV   | EVS                |              | 2       | 2      | Environmental studies            | 25            | 75       | 100   |
|      |      | TOTAL              |              | 30      | 22     |                                  | 165           | 435      | 600   |

### SEMESTER II

|    |     |                   |  |   |   |                               |    |    |     |
|----|-----|-------------------|--|---|---|-------------------------------|----|----|-----|
| 7  | I   | Language – II     |  | 6 | 4 | Tamil – II / Other language   | 25 | 75 | 100 |
| 8  | II  | English – II      |  | 4 | 4 | English – II                  | 25 | 75 | 100 |
| 9  | III | Core paper – II   |  | 6 | 4 | Internet and its Applications | 25 | 75 | 100 |
| 10 | III | Core Practical II |  | 3 | 3 | Internet and its Applications | 40 | 60 | 100 |

|    |     |                      |  |    |    |   |     |     |     |
|----|-----|----------------------|--|----|----|---|-----|-----|-----|
| 11 | III | Allied paper – II    |  | 4  | 3  | Mathematics and statistics for management | 25  | 75  | 100 |
| 12 | III | Allied practical – I |  | 3  | 2  | Quantitative Techniques                   | 40  | 60  | 100 |
| 13 | IV  | Value education      |  | 2  | 2  | Value education                           | -   | 50  | 50  |
| 14 | IV  | Soft skills          |  | 2  | 1  | Soft skills                               | -   | 50  | 50  |
|    |     | TOTAL                |  | 30 | 23 |   | 180 | 520 | 700 |

### SEMESTER III

|    |     |                         |  | Ins/Hrs | Credit |  | CIA | UNI. EXAM | TOTAL |
|----|-----|-------------------------|--|---------|--------|--|-----|-----------|-------|
| 15 | I   | Language – III          |  | 6       | 4      | Tamil – III/<br>Other language           | 25  | 75        | 100   |
| 16 | II  | English – III           |  | 6       | 4      | English –III                             | 25  | 75        | 100   |
| 17 | III | Core paper – III        |  | 4       | 4      | Programming in C and C++                 | 25  | 75        | 100   |
| 18 | III | Core practical – III    |  | 3       | 3      | Practical :<br>Programming in C and C++  | 40  | 60        | 100   |
| 19 | III | Allied paper – III      |  | 7       | 5      | Business Policy and Strategic Management | 25  | 75        | 100   |
| 20 | IV  | Skill based subject – I |  | 2       | 2      | Business communication                   | -   | 50        | 50    |
| 21 | IV  | Non – major – I         |  | 2       | 2      | Business Environment                     | -   | 50        | 50    |
|    |     | TOTAL                   |  | 30      | 24     |  | 140 | 460       | 600   |

### SEMESTER IV

|    |     |                     |  |   |   |                               |    |    |     |
|----|-----|---------------------|--|---|---|-------------------------------|----|----|-----|
| 22 | I   | Language – IV       |  | 6 | 4 | Tamil – IV/<br>Other language | 25 | 75 | 100 |
| 23 | II  | English – IV        |  | 6 | 4 | English –IV                   | 25 | 75 | 100 |
| 24 | III | Core paper – IV     |  | 4 | 4 | RDBMS                         | 25 | 75 | 100 |
| 25 | III | Core practical – IV |  | 3 | 3 | Practical :<br>RDBMS          | 40 | 60 | 100 |
| 26 | III | Allied paper –      |  | 7 | 5 | Organizational behavior       | 25 | 75 | 100 |

|    |    |                          |  |    |    |                   |     |     |     |
|----|----|--------------------------|--|----|----|-------------------|-----|-----|-----|
|    |    | IV                       |  |    |    |                   |     |     |     |
| 27 | IV | Skill based subject – II |  | 2  | 2  | E – Business      | -   | 50  | 50  |
| 28 | IV | Non – major – II         |  | 2  | 2  | Digital Marketing | -   | 50  | 50  |
|    |    | TOTAL                    |  | 30 | 24 |                   | 140 | 460 | 600 |
|    |    |                          |  |    |    |                   |     |     |     |

| SEMESTER- V  |     |                           |  |                     |                |  |     |               |       |
|--------------|-----|---------------------------|--|---------------------|----------------|--|-----|---------------|-------|
|              |     |                           |  | In<br>s/<br>Hr<br>s | Cr<br>edi<br>t |  | CIA | UN.I.E<br>XAM | TOTAL |
| 29           | III | Core paper – V            |  | 6                   | 3              | Multimedia   | 25  | 75            | 100   |
| 30           | III | Core paper – VI           |  | 7                   | 4              | Web technology                                       | 25  | 75            | 100   |
| 31           | III | Core paper – VII          |  | 6                   | 4              | Marketing Management                                 | 25  | 75            | 100   |
| 32           | III | Core practical–V          |  | 3                   | 3              | Multimedia using Flash                               | 40  | 60            | 100   |
| 33           | III | Elective – I              |  | 3                   | 3              | Principles of Human Resource Management - I          | 25  | 75            | 100   |
| 34           | III | Elective – II             |  | 3                   | 3              | International Business Management – I                | 25  | 75            | 100   |
| 35           | IV  | Skill based subject – III |  | 2                   | 2              | Personality Development and Soft Skills for Business | -   | 50            | 50    |
|              |     | TOTAL                     |  | 30                  | 22             |  | 165 | 485           | 650   |
| SEMESTER –VI |     |                           |  |                     |                |  |     |               |       |
|              |     |                           |  |                     |                |  | CIA | UN.I.E        | TOTAL |

|    |     |                          |  |    |     |  |     |     |      |
|----|-----|--------------------------|--|----|-----|--|-----|-----|------|
|    |     |                          |  |    |     |  |     | XAM |      |
| 36 | III | Core paper –VIII         |  | 8  | 4   | Programming in JAVA                          | 25  | 75  | 100  |
| 37 | III | Core paper – IX          |  | 8  | 4   | Marketing Research                           | 25  | 75  | 100  |
| 38 | III | Core practical – VI      |  | 3  | 3   | JAVA Programming and Web Technology          | 40  | 60  | 100  |
| 39 | III | Core practical – VII     |  | 3  | 3   | Tally Practical                              | 40  | 60  | 100  |
| 40 | III | Elective – III           |  | 3  | 3   | Principles of Human Resource Management – II | 25  | 75  | 100  |
| 41 | III | Elective – IV            |  | 3  | 3   | International Business Management – II       | 25  | 75  | 100  |
| 42 | IV  | Skill based subject – IV |  | 2  | 2   | Business Ethics                              | -   | 50  | 50   |
| 43 | V   | Extension Activities     |  | -  | 3   | Extension Activities                         | 100 | -   | 100  |
|    |     |                          |  | 30 | 25  |  | 280 | 470 | 750  |
|    |     |                          |  |    | 140 |  |     |     | 3900 |

#### CONSOLIDATED STATEMENT

| PART     | SUBJECT            | PAPERS | CREDIT         | TOTAL CREDITS | MARKS | TOTAL MARKS |
|----------|--------------------|--------|----------------|---------------|-------|-------------|
| Part I   | Languages          | 4      | 4              | 16            | 100   | 400         |
| Part II  | English            | 4      | 4              | 16            | 100   | 400         |
| Part III | Allied (Theory)    | 4      | 3 (5)          | 18            | 100   | 400         |
|          | Allied (Practical) | 1      | 1 (3)<br>1 (2) | 02            | 100   | 100         |
| Part III | Elective           | 4      | 3              | 12            | 100   | 400         |

|          |                      |    |                |            |     |             |
|----------|----------------------|----|----------------|------------|-----|-------------|
| Part III | Core Theory          | 09 | 8 (4)<br>1 (3) | 35         | 100 | 900         |
| Part III | Core Practical       | 7  | 3              | 21         | 100 | 700         |
| Part IV  | EVS                  | 1  | 2              | 2          | 100 | 100         |
| Part IV  | Value Education      | 1  | 2              | 2          | 50  | 50          |
| Part IV  | Skill Based Subject  | 4  | 2              | 8          | 50  | 200         |
| Part IV  | Non – Major          | 2  | 2              | 4          | 50  | 100         |
| Part IV  | Soft Skill           | 1  | 1              | 1          | 50  | 50          |
| Part V   | Extension Activities | -  | 3              | 3          | 100 | 100         |
|          | <b>Total</b>         |    |                | <b>140</b> |     | <b>3900</b> |

### ALLIED - MATHEMATICS AND STATISTICS FOR MANAGEMENT

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| II       |              | Allied   | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 3      |
|          |              |          | 4        | 60      | 4        | 60      |           |        |

### COURSE OBJECTIVES

- To provide basic knowledge in Mathematics and Statistics to solve problems in business disciplines.
- To develop the ability to analyze, interpret data and to provide meaningful information to assist in making management decisions

### COURSE OUTCOMES

| CO Number  | CO Statement  | Knowledge Level(K1-K4) |
|------------|---|------------------------|
| <b>CO1</b> | To study the types of Matrices                                  | K1                     |
| <b>CO2</b> | To understand the concept of Measures of Central Tendency       | K2                     |
| <b>CO3</b> | To know the relation between the correlation and the regression | K3                     |
| <b>CO4</b> | To test and to draw conclusions in small samples                | K3                     |
| <b>CO5</b> | To analyze the concept of variance                              | K2                     |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

### MAPPING WITH PROGRAMME OUTCOMES

| Cos        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | M   | M   | S   | S   | M   | M   |
| <b>CO2</b> | S   | S   | M   | M   | S   | M   |
| <b>CO3</b> | S   | M   | M   | M   | S   | M   |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO4</b> | M | S | S | M | M | S |
| <b>CO5</b> | S | S | S | M | M | M |

S- Strong: M- Medium: L- Low

## **UNIT I –MATRICES**

**15 Hrs**

Definition of Matrix – Different types of Matrices- Transpose of Matrix – Matrix Operation- Addition – Subtraction- Multiplication of Matrices – Determinants of a matrix of order two and three- Adjoint of a square matrix- Inverse of a square matrix – solution of linear simultaneous equations.

## **UNIT II - STATISTICS – MEASURES OF CENTRAL TENDANCY 15 Hrs**

Statistics – Definition – scope and limitation- presentation of data –diagrammatic and graphical representation of data- measure of central tendency- mean. Median. Mode- standard deviation- their limitations.

## **UNIT III- CORRELATION**

**15 Hrs**

Correlation – Linear correlation – Coefficient of correlation- Rank correlation

## **UNIT IV- REGRESSION**

**15 Hrs**

Regression - Regression lines - the linear Regression Equations.

## **UNIT V- TESTING OF HYPOTHESIS**

**15 Hrs**

Test of hypothesis – Students t test, chi square test, F- Test

**DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS: 80%**

## **TEXT BOOK**

| <b>S.NO</b> | <b>AUTHORS</b> | <b>TITLE</b>                        | <b>PUBLISHERS</b>    | <b>YEAR OF PUBLICATION</b> |
|-------------|----------------|-------------------------------------|----------------------|----------------------------|
| 1.          | P.R.Vittal     | Business Mathematics and Statistics | Margham Publications | 2011                       |

## **REFERENCE BOOK**

| <b>S.NO</b> | <b>AUTHORS</b>                     | <b>TITLE</b>  | <b>PUBLISHERS</b>                                | <b>YEAR OF PUBLICATION</b>    |
|-------------|------------------------------------|---|--|-------------------------------|
| 1.          | Murray R. Spiegal                  | Theory and problem of Statistics – Schaumoutline series | Mc.Graw Hill co.,New York                        | 2007(4 <sup>th</sup> edition) |
| 2.          | V.K.,Khanna and S.K.Bhambi         | Business Mathematics                                    | Qazi Zameerudin-Vikas Publishing, House Pvt.Ltd. | 2009                          |
| 3.          | M.Ragavachari                      | Mathematics for Management                              | Tata McGraw Hill, New Delhi.                     | 1980                          |
| 4.          | Richard I.Levin and David S. Rubin | Statistics for management                               | Prentice Hall of India, New Delhi                | 1996                          |



## WEB RESOURCES

1. <http://www.statsoft.com/textbook/stathome.html>
2. <http://home.it.net.au/~bejel/avu/support/>

## TEACHING METHODOLOGY

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

## SYLLABUS DESIGNERS

1. Mrs. G. Chitra, Assistant Professor of Mathematics
2. Miss. R. Chithra, Assistant Professor of Mathematics.

### ALLIED PRACTICAL I - QUANTITATIVE TECHNIQUES

| Semester | Subject Code | Category | Lecture  |         | Theory | Practical |         | Credit |
|----------|--------------|----------|----------|---------|--------|-----------|---------|--------|
| II       |              | Allied   | Hrs/week | Hrs/Sem | 0      | Hrs/week  | Hrs/Sem | 2      |
|          |              |          | 3        | 45      |        | 3         | 45      |        |

## COURSE OBJECTIVES

- To introduce the concept of Mathematics in business
- To apply the concept of statistics and to solve problems

## SYLLABUS

1. Matrices - Inverse of a Matrix- Cramer's Rule.
2. Differentiation - Maxima and Minima.
3. Integration - Definite Integrals.
4. Diagrams and Graphs.
5. Mean, Median, Mode.
6. Correlation.
7. Regressions.
8. t-Test, Chi Square Test.

## DISTRIBUTION OF MARKS: PROBLEMS 100%

## TEXT BOOKS

| S.NO | AUTHORS                        | TITLE            | PUBLISHERS     | YEAR OF PUBLICATION |
|------|--------------------------------|------------------|----------------|---------------------|
| 1.   | George Simpson and Fritz Kafta | Basic Statistics | Oxford and IBH | 1965                |

#### REFERENCE BOOKS

| S.N O | AUTHORS                             | TITLE                     | PUBLISHERS             | YEAR OF PUBLICATION |
|-------|-------------------------------------|---------------------------|------------------------|---------------------|
| 1.    | Kapur and Saxena,                   | Mathematical Statistics   | S.Chand and Co., Delhi | 2001                |
| 2.    | Richard I. Levin and David S. Rubin | Statistics for Management | Prentice Hall of India | 1996                |

#### WEB SOURCES

1. <http://en.wikipedia.org/wiki/statistics>.
2. <http://en.wikipedia.org/wiki/mathematics>

#### TEACHING METHODOLOGY

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

#### SYLLABUS DESIGNER

1. Ms. S.Santhiya, Assistant Professor Of Mathematics.
2. Mrs. G.Chitra, Assistant Professor Of Mathematics.

### BBA – Bachelor Of Business Administration

#### PROGRAMME EDUCATIONAL OBJECTIVES (PEO) :

**PEO 1 :**To provide the fundamental concepts and theory of business practice and understanding of the global context in which business operates.

**PEO 2:** To develop the ability to think critically, Analyze problems quantitatively and to use a variety of appropriate in solving business problems.

**PROGRAMME OUTCOMES (PO) :**

**PO 1 :**Students will be able to demonstrate foundational knowledge of the functional areas of business.

**PO 2 :** To provide students with a broad range of managerial capabilities, the capacity for critical thinking, communication and problem-solving skills, legal and ethical behavior.

**PO 3 :** Students will be able to demonstrate knowledge of the ethical obligations of business and apply them to business decisions.

**PO 4 :**Students identify business opportunities and formulate plans, and detect business problems and develop alternative solutions.

**PO 5 :**To prepare graduates for diverse careers in global management, administration and entrepreneurship through a well-rounded business education with a focus on global business operations, emerging markets and technology-enabled organizations.

**PO 6 :** To develop appropriate skills in the students so as to make them competent and provide themselves self – employment.

**DEPARTMENT OF MANAGEMENT STUDIES****BBA****SEMESTER- I**

| S.NO | PART | COURSE TITLE     | SUBJECT CODE | Ins/Hrs | Credit | Title of the paper                       | MAXIMUM MARKS |          |       |
|------|------|------------------|--------------|---------|--------|--|---------------|----------|-------|
|      |      |                  |              |         |        |  | CIA           | UNI.EXAM | TOTAL |
| 1    | I    | Language – I     |              | 6       | 4      | Tamil – I / Other language               | 25            | 75       | 100   |
| 2    | II   | English – I      |              | 6       | 4      | English – I                              | 25            | 75       | 100   |
| 3    | III  | Core paper – I   |              | 5       | 4      | Principles of management – I             | 25            | 75       | 100   |
| 4    | III  | Core paper - II  |              | 5       | 4      | Production and Operations management – I | 25            | 75       | 100   |
| 5    | III  | Allied paper – I |              | 6       | 5      | Business mathematics and                 | 25            | 75       | 100   |

|   |    |       |  |    |    |                |     |     |     |
|---|----|-------|--|----|----|----------------|-----|-----|-----|
|   |    |       |  |    |    | Statistics – I |     |     |     |
| 6 | IV | EVS   |  | 2  | 2  | EVS            | 25  | 75  | 100 |
|   |    | TOTAL |  | 30 | 23 |                | 150 | 450 | 600 |

### SEMESTER II

|    |     |                   |  |    |    |   |     |     |     |
|----|-----|-------------------|--|----|----|---|-----|-----|-----|
| 7  | I   | Language – II     |  | 6  | 4  | Tamil – II / Other language               | 25  | 75  | 100 |
| 8  | II  | English – II      |  | 4  | 4  | English – II                              | 25  | 75  | 100 |
| 9  | III | Core paper – III  |  | 5  | 4  | Principles of management – II             | 25  | 75  | 100 |
| 10 | III | Core paper – IV   |  | 5  | 4  | Production and Operations management – II | 25  | 75  | 100 |
| 11 | III | Allied paper – II |  | 6  | 5  | Business mathematics and Statistics – II  | 25  | 75  | 100 |
| 12 | IV  | Value education   |  | 2  | 2  | Value education                           | -   | 50  | 50  |
| 13 | IV  | Soft skills       |  | 2  | 1  | Soft skills                               | -   | 50  | 50  |
|    |     | TOTAL             |  | 30 | 24 |   | 125 | 475 | 600 |

### SEMESTER III

|    |     |                   |  |   |   |  |    |    |     |
|----|-----|-------------------|--|---|---|--|----|----|-----|
| 14 | II  | Core paper – VI   |  | 6 | 4 | Business Policy and Strategic Management | 25 | 75 | 100 |
| 15 | III | Core paper – VII  |  | 5 | 4 | Financial Accounting                     | 25 | 75 | 100 |
| 16 | III | Elective paper –I |  | 3 | 3 | Principles of Banking                    | 25 | 75 | 100 |
| 17 | III | Allied paper –    |  | 6 | 5 | Managerial Economics                     | 25 | 75 | 100 |

|                    |     |                          |  |    |    |                                |     |     |     |
|--------------------|-----|--------------------------|--|----|----|--------------------------------|-----|-----|-----|
|                    |     | III                      |  |    |    |                                |     |     |     |
| 18                 | IV  | Skill based subject – I  |  | 2  | 2  | Business communication         | -   | 50  | 50  |
| 19                 | IV  | Non – major – I          |  | 2  | 2  | Leadership skills              | -   | 50  | 50  |
|                    |     | Total                    |  | 30 | 24 |                                | 125 | 475 | 600 |
| <b>SEMESTER IV</b> |     |                          |  |    |    |                                |     |     |     |
| 20                 | I   | Core paper –VIII         |  | 6  | 4  | Materials Management – II      | 25  | 75  | 100 |
| 21                 | II  | Core paper – IX          |  | 5  | 4  | Cost and Management Accounting | 25  | 75  | 100 |
| 22                 | III | Core paper – X           |  | 6  | 4  | Organisational behavior        | 25  | 75  | 100 |
| 23                 | III | Elective paper –II       |  | 3  | 3  | Management Information System  | 25  | 75  | 100 |
| 24                 | III | Allied paper – IV        |  | 6  | 5  | Operations Research            | 25  | 75  | 100 |
| 25                 | IV  | Skill based subject – II |  | 2  | 2  | E – Business                   | -   | 50  | 50  |
| 26                 | IV  | Non – major – II         |  | 2  | 2  | Entrepreneurial management     | -   | 50  | 50  |
|                    |     | TOTAL                    |  | 30 | 24 |                                | 125 | 475 | 600 |

| <b>SEMESTER- V</b> |     |                  |  |   |   |                                   |            |                      |              |
|--------------------|-----|------------------|--|---|---|-----------------------------------|------------|----------------------|--------------|
|                    |     |                  |  |   |   |                                   | <b>CIA</b> | <b>UNI.E<br/>XAM</b> | <b>TOTAL</b> |
| 27                 | III | Core paper – XII |  | 6 | 4 | International Business Management | 25         | 75                   | 100          |
| 28                 | III | Core paper –     |  | 6 | 4 | Marketing                         | 25         | 75                   | 100          |

|    |     |                           |  |    |    |  |     |     |     |
|----|-----|---------------------------|--|----|----|--|-----|-----|-----|
|    |     | XIII                      |  |    |    | Management   |     |     |     |
| 29 | III | Core paper – XIV          |  | 6  | 4  | Principles of Human Resource Management – I          | 25  | 75  | 100 |
| 30 | III | Elective – III            |  | 4  | 3  | Legal Aspects Of Business                            | 25  | 75  | 100 |
| 31 | IV  | Skill based subject – III |  | 2  | 2  | Personality Development and soft skills for Business | -   | 50  | 50  |
|    |     | TOTAL                     |  | 30 | 21 |  | 125 | 425 | 550 |

**SEMESTER- VI**

|    |     |                          |  |           |            |  | <b>CIA</b> | <b>UNI.E<br/>XAM</b> | <b>TOTAL</b> |
|----|-----|--------------------------|--|-----------|------------|--|------------|----------------------|--------------|
| 32 | III | Core paper – XV          |  | 6         | 4          | Entrepreneurial Management                   | 25         | 75                   | 100          |
| 33 | III | Core paper – XVI         |  | 6         | 4          | Marketing Research                           | 25         | 75                   | 100          |
| 34 | III | Core paper – XVII        |  | 6         | 4          | Financial Management                         | 25         | 75                   | 100          |
| 35 | III | Core paper – XVIII       |  | 6         | 4          | Principles of Human Resource Management – II | 25         | 75                   | 100          |
| 36 | III | Elective – IV            |  | 4         | 3          | Business Ethics                              | 25         | 75                   | 100          |
| 37 | IV  | Skill based subject – IV |  | 2         | 2          | Practical : Tally                            | -          | 50                   | 50           |
| 38 | V   | Extension Activities     |  | -         | 3          | Extension Activities                         | 100        | -                    | 100          |
|    |     |                          |  |           |            |  |            |                      |              |
|    |     | <b>TOTAL</b>             |  | <b>30</b> | <b>24</b>  |  | <b>225</b> | <b>425</b>           | <b>650</b>   |
|    |     |                          |  |           | <b>140</b> |  |            |                      | <b>3600</b>  |

## CONSOLIDATED STATEMENT

| PART     | SUBJECT              | PAPERS | CREDIT | TOTAL CREDITS | MARKS | TOTAL MARKS |
|----------|----------------------|--------|--------|---------------|-------|-------------|
| Part I   | Languages            | 2      | 4      | 8             | 100   | 200         |
| Part II  | English              | 2      | 4      | 8             | 100   | 200         |
| Part III | Allied               | 4      | 5      | 20            | 100   | 400         |
| Part III | Elective             | 4      | 3      | 12            | 100   | 400         |
| Part III | Core Theory          | 18     | 4      | 72            | 100   | 1800        |
| Part III | Core Practical       | -      | -      | -             | -     | -           |
| Part IV  | EVS                  | 1      | 2      | 2             | 100   | 100         |
| Part IV  | Value Education      | 1      | 2      | 2             | 50    | 50          |
| Part IV  | Skill Based Subject  | 4      | 2      | 8             | 50    | 200         |
| Part IV  | Non – Major          | 2      | 2      | 4             | 50    | 100         |
| Part IV  | Soft Skill           | 1      | 1      | 1             | 50    | 50          |
| Part V   | Extension Activities | -      | 3      | 3             | 100   | 100         |
|          | Total                |        |        | 140           |       | 3600        |

## ALLIED - BUSINESS MATHEMATICS AND STATISTICS –I

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| I        |              | Allied   | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 5      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

### COURSE OBJECTIVES

- The objective of this course is to provide an intense foundational introduction to the fundamental concepts in Statistics.
- To acquire knowledge and skills to solve problems

### COURSE OUTCOMES

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To acquire the knowledge about the scope and the limitation of Statistics | K4                      |
| CO2       | To learn Mean, Median, Mode, Geometric Mean and Harmonic Mean             | K2                      |

|            |  |    |
|------------|--|----|
| <b>CO3</b> | To introduce the concept of Measures of Dispersion, Range, Standard Deviation and Coefficient of Variation               | K2 |
| <b>CO4</b> | To find Simple and Compound Interest   | K2 |
| <b>CO5</b> | To apply Differentiation of sum, Product and Quotient Chain Rule , Maxima and Minima and their applications in Business. | K3 |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

### **MAPPING OF PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | M          | M          | M          | S          |
| <b>CO2</b> | S          | S          | S          | M          | M          | S          |
| <b>CO3</b> | M          | S          | S          | M          | M          | S          |
| <b>CO4</b> | M          | S          | S          | S          | S          | M          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

*S- Strong; M-Medium; L-Low*

### **UNIT- I - INTRODUCTION**

**18 Hours**

Statistics - Definition - Scope and limitation - Presentation of data - Diagrammatic and Graphical Representation of Data

### **UNIT – II - MEASURES OF CENTRAL TENDENCY**

**18 Hours**

Measures of Central Tendency - Mean, Median and Mode - Geometric mean and Harmonic mean Their Limitations.

### **UNIT – III- MEASURES OF DISPERSION**

**18 Hours**

Measures of Dispersion - Range - Standard Deviation - Coefficient of Variation.

### **UNIT- IV- FINANCIAL MATHEMATICS**

**18 Hours**

Mathematics for Finance - Simple and Compound Interest.

### **UNIT- V- DIFFERENTIATION**

**18 Hours**

Differentiation of sum - Product and Quotient Chain Rule - Maxima and Minima and their applications of Business.

**DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%**

### **TEXT BOOKS**

| <b>S.No</b> | <b>AUTHORS</b> | <b>TITLE</b>                        | <b>PUBLISHERS</b>    | <b>YEAR OF PUBLICATION</b> |
|-------------|----------------|-------------------------------------|----------------------|----------------------------|
| 1           | P.R. Vittal    | Business Mathematics and Statistics | Margham Publications | 2011                       |



## REFERENCE BOOKS

| S.No | AUTHORS       | TITLE                                | PUBLISHERS           | YEAR OF PUBLICATION |
|------|---------------|--------------------------------------|----------------------|---------------------|
| 1    | S.P.Gupta     | Business Mathematical Statistics     | Pearson Publications | 1998                |
| 2    | P.Navaneethan | Introduction to Theory of Statistics | McGraw Hill          | 1974                |
| 3    | J.K. Sharma   | Statistical Methods                  | McGraw Hill.         | 1971                |

## WEB SOURCES

<https://learn.saylor.org/course>

<https://byjus.com>

<https://www.statpac.com/>

## TEACHING METHODOLOGY

1. Black Board Teaching
2. Smart Board Class Teaching
3. Unit wise Assignments
4. Class Room Discussions and Seminars.
5. Group works.

## SYLLABUS DESIGNER

1. Mrs.K Kavitha, Assistant Professor of Mathematics
2. Mrs. R Ramya , Assistant Professor of Mathematics

### ALLIED-BUSINESS MATHEMATICS AND STATISTICS II

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| II       |              | Allied   | Hrs/week | Hrs/sem | Hrs/week | Hrs/sem | 0         | 5      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

## COURSE OBJECTIVES

- To apply the concept of Statistics and Mathematics in business.
- This course provides practical knowledge in the field of Mathematical Statistics.

## COURSE OUTCOMES

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To study the types of matrices and to find adjoint of matrix and inverse of matrix.         | K1                      |
| CO2       | To find the correlation and rank correlation.   | K4                      |
| CO3       | To acquire knowledge about the Regression   | K3                      |
| CO4       | To analyse small samples and to draw conclusions  | K3                      |
| CO5       | To discuss and understand the Analysis of variance using one way and two way classification | K2                      |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze*

## MAPPING OF PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | M   | S   | M   |
| CO2 | S   | S   | M   | S   | S   | S   |
| CO3 | S   | S   | S   | S   | S   | S   |
| CO4 | M   | S   | S   | S   | S   | S   |
| CO5 | M   | S   | S   | S   | S   | S   |

### UNIT-I- MATRIX

**18Hours**

Definition of Matrix - Different types of matrices - Transpose of matrix - Operations - Additional Subtraction - Multiplication of matrix of order two or three - Adjoint of a Square matrix - Inverse of a square matrix .

### UNIT – II- CORRELATION

**18 Hours**

Correlation - Scatter Diagram - Karl Pearson's Correlation - Rank Correlation.

### UNIT – III - REGRESSION

**18 Hours**

Regression Lines - Regressions Coefficients - Properties of Regression Coefficients - Uses of Regression in Business Problem

### UNIT- IV- TEST OF SIGNIFICANCE

**18 Hours**

Test Based on t-test, chi-square test, and f- test Distribution with regard to mean, Variance.

### UNIT- V- INDEX NUMBER

**18 Hours**

Methods of construction of index numbers, Unweighted Aggregate price index, Weighted Aggregate Index number, Fisher's Price Index number, Average of Relative Price indices, Unweighted Arithmetic mean price relative index, Weighted AM relative index, Quantity Index Number, Tests for index numbers, Time reversal test, Factor reversal.

## **DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%**

### **TEXTBOOKS**

| <b>S.No</b> | <b>AUTHORS</b> | <b>TITLE</b>                        | <b>PUBLISHERS</b>   | <b>YEAR OF PUBLICATION</b> |
|-------------|----------------|-------------------------------------|---------------------|----------------------------|
| 1           | P.R.Vittal     | Business Mathematics and Statistics | Margham Publication | 2011                       |

### **REFERENCE BOOKS**

| <b>S.No</b> | <b>AUTHORS</b>  | <b>TITLE</b>                    | <b>PUBLISHERS</b>    | <b>YEAR OF PUBLICATION</b> |
|-------------|-----------------|---------------------------------|----------------------|----------------------------|
| 1           | J.K. Sharma     | Business Statistics             | Pearson Publications | 2001                       |
| 2           | E.B.Mode        | Elements of Statistics          | Prentice Hall        | 2002                       |
| 3           | S.S. Wilks      | Elementary Statistical Analysis | Oxford and IBH.      | 1991                       |
| 4           | Levin and Rubin | Statistics for Management       | Pearson Publications | 1997                       |

### **WEB SOURCES**

1. [https://books.google.co.in/books/about/Business\\_Mathematics\\_Statistics.html?id=h8MRWarndOwC](https://books.google.co.in/books/about/Business_Mathematics_Statistics.html?id=h8MRWarndOwC)
2. <https://www.goodreads.com/book/show/30652420-business-mathematics-and-statistics>

### **TEACHING METHODOLOGY**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

### **SYLLABUS DESIGNER**

1. Mrs. R Ramya , Assistant Professor of Mathematics.
2. Mrs.KKavitha, Assistant Professor of Mathematics.

## DEPARTMENT OF COMPUTER SCIENCE

### PROGRAMME EDUCATIONAL OBJECTIVES

**PEO1.** Graduates will have skills and knowledge to excel in their professional career in Computer Science and its related disciplines.

**PEO2.** Graduates will be ethically and socially responsible solution providers in Computer Science and successfully pursue higher education in reputed institutions.

### PROGRAMME OUTCOME

**PO1:Problem Analysis:** To identify, formulate and analyze complex Computer Science and Applications problems in the areas of hardware, software, theoretical Computer Science to reach significant conclusions by applying Mathematics, Natural sciences, Accounts, Computer Science and Applications principles.

**PO2:Design & Development of Solutions:** To design and build a system, component, process or a program for complex problems by factoring in all the requirements and various design tradeoffs, with appropriate consideration for the public health and safety, cultural, social and environmental factors

**PO3. Modern Tool Usage:** To create, select and apply state of the art tools and techniques in designing, developing and testing a computing system or its component.

**PO4. Ethics:** To apply professional ethics and cyber regulations, responsibilities and pledge to the norms of professional computing practice.

**PO5. Environment and Sustainability:** To demonstrate the knowledge of sustainable development of computing systems/products/solutions with an understanding of the impact of these solutions on the Society and Environment.

**PO6. Life-long Learning:** To spot the need for and engage in lifelong learning to cope up with the rapidly evolving disciplines of Computer Science and applications domains.

## DEPARTMENT OF B.Sc., COMPUTER SCIENCE

### SEMESTER- I

| SN<br>O | PART | COURSE<br>TITLE |         | Ins/<br>Hrs | Cr<br>edi<br>t | Title of the paper                    | MAXIMUN MARKS |              |       |
|---------|------|-----------------|---------|-------------|----------------|---------------------------------------|---------------|--------------|-------|
|         |      |                 |         |             |                |                                       | CIA           | UNI.<br>EXAM | TOTAL |
| 1       | I    | Language        | Paper-1 | 6           | 4              | Language                              | 25            | 75           | 100   |
| 2       | II   | English         | Paper-1 | 6           | 4              | Foundation<br>English-I               | 25            | 75           | 100   |
| 3       | III  | Core(T)         | Paper-1 | 7           | 4              | Digital Logic and<br>Programming in C | 25            | 75           | 100   |

|   |    |                |             |    |    |                  |     |     |     |
|---|----|----------------|-------------|----|----|------------------|-----|-----|-----|
| 4 | IV | Core Practical | Practical 1 | 3  | 3  | Programming in C | 40  | 60  | 100 |
| 5 | V  | Allied         | Paper-1     | 6  | 5  | Mathematics I    | 25  | 75  | 100 |
| 6 | VI | EVS            |             | 2  | 2  | EVS              | 25  | 75  | 100 |
|   |    | TOTAL          |             | 30 | 22 |                  | 165 | 435 | 600 |

### **SEMESTER II**

| SN O | PART | COURSE TITLE   |             | Ins/ Hrs | Credit | Title of the paper                      | CIA | UNI. EXAM | TOTAL |
|------|------|----------------|-------------|----------|--------|---|-----|-----------|-------|
| 7    | I    | Language       | Paper-2     | 6        | 4      | Language                                | 25  | 75        | 100   |
| 8    | II   | English        | Paper-2     | 4        | 4      | Foundation English-II                   | 25  | 75        | 100   |
| 9    | III  | Core(T)        | Paper-2     | 6        | 4      | C++ and Data Structure                  | 25  | 75        | 100   |
| 10   | III  | Core practical | Practical-2 | 3        | 3      | C++ and Data Structure                  | 40  | 60        | 100   |
| 11   | III  | Allied         | Paper-2     | 6        | 5      | Mathematics II                          | 25  | 75        | 100   |
| 12   | III  | VE             |             | 3        | 2      | VE                                      | -   | 50        | 50    |
| 13   | IV   | Soft skill     |             | 2        | 1      | Soft skill for Linguistic Communication | -   | 50        | 50    |
|      |      | TOTAL          |             | 30       | 23     |   | 140 | 460       | 600   |

### **SEMESTER III**

| SN O | PART | COURSE TITLE   |             | Ins/ Hrs | Credit | Title of the paper                         | CIA | UNI. EXAM | TOTAL |
|------|------|----------------|-------------|----------|--------|--|-----|-----------|-------|
| 14   | I    | Language       | Paper-3     | 6        | 4      | Language                                   | 25  | 75        | 100   |
| 15   | II   | English        | Paper-3     | 6        | 4      | Foundation English-III                     | 25  | 75        | 100   |
| 16   | III  | Core(T)        | Paper-3     | 5        | 4      | Visual Programmin g and DBMS               | 25  | 75        | 100   |
| 17   | III  | Core Practical | Practical-3 | 3        | 3      | Visual Programmin g and DBMS               | 40  | 60        | 100   |
| 18   | III  | Allied         | Paper-3     | 6        | 5      | Statistical Methods and their applications | 25  | 75        | 100   |
| 19   | IV   | Skilled Based  | Practical 1 | 2        | 2      | Unix Shell Programmin g                    | -   | 50        | 50    |

|    |    |           |         |    |    |  |     |     |     |
|----|----|-----------|---------|----|----|--|-----|-----|-----|
| 20 | IV | Non major | Paper-1 | 2  | 2  | Introduction to Information Technology | -   | 50  | 50  |
|    |    | TOTAL     |         | 30 | 24 |  | 140 | 460 | 600 |

**SEMESTER -IV**

|    |     |                |             |    |    |  | CIA | UNI.EXAM | TOTAL |
|----|-----|----------------|-------------|----|----|--|-----|----------|-------|
| 21 | I   | Language       | Paper-4     | 6  | 4  | Language                                   | 25  | 75       | 100   |
| 22 | II  | English        | Paper-4     | 6  | 4  | Foundation English -IV                     | 25  | 75       | 100   |
| 23 | III | Core(T)        | Paper-4     | 5  | 4  | Asp.net                                    | 25  | 75       | 100   |
| 24 | III | Core practical | Practical-4 | 3  | 3  | Asp.net                                    | 40  | 60       | 100   |
| 25 | III | Allied         | Paper-4     | 6  | 5  | Statistical Methods and their applications | 25  | 75       | 100   |
| 26 | III | Skill based    | Practical-2 | 2  | 2  | Microprocessor                             | -   | 50       | 50    |
| 27 | IV  | Non-Major      | Paper-2     | 2  | 2  | Internet and its Applications              | -   | 50       | 50    |
|    |     | TOTAL          |             | 30 | 24 |  | 140 | 460      | 600   |

Internship Training Program during summer vocation with an extra credit = 1

**SEMESTER- V**

| SNO | PART | COURSE TITLE   |             | Ins/Hrs | Credit | Title of the paper        | CIA | UNI. EXAM | TOTAL |
|-----|------|----------------|-------------|---------|--------|---------------------------|-----|-----------|-------|
| 28  | III  | Core (T)       | Paper-5     | 6       | 4      | Advanced Java Programming | 25  | 75        | 100   |
| 29  | III  | Core (T)       | Paper-6     | 6       | 4      | Programming with Python   | 25  | 75        | 100   |
| 30  | III  | Core practical | Practical-5 | 3       | 3      | Advanced Java Programming | 40  | 60        | 100   |
| 31  | III  | Core practical | Practical-6 | 3       | 3      | Programming with Python   | 40  | 60        | 100   |
| 32  | III  | Elective-I     | Paper-1     | 5       | 3      | 1.Operating System        | 25  | 75        | 100   |

|    |     |             |             |    |    |  |     |     |     |
|----|-----|-------------|-------------|----|----|--|-----|-----|-----|
|    |     |             |             |    |    | 2. Computer Graphics   |     |     |     |
| 33 | III | Elective-II | Paper-2     | 5  | 3  | 1. Data Communication and Networking.<br>2. Digital Image Processing | 25  | 75  | 100 |
| 34 | IV  | Skill Based | Practica-3l | 2  | 2  | Open Source Programming  | -   | 50  | 50  |
|    |     | TOTAL       |             | 30 | 22 |  | 180 | 470 | 650 |

**SEMESTER –VI**

|    |     |                    |             |    |    |   | CIA | UNI. EXAM | TOTAL |
|----|-----|--------------------|-------------|----|----|---|-----|-----------|-------|
| 35 | III | Core (T)           | Paper-7     | 6  | 4  | Android Programming   | 25  | 75        | 100   |
| 36 | III | Core (T)           | Paper-8     | 6  | 4  | Cloud Computing   | 25  | 75        | 100   |
| 37 | III | Core practical     | Practical-7 | 3  | 3  | Android Programming   | 40  | 60        | 100   |
| 38 | III | Core practical     | Practical-8 | 3  | 3  | Cloud Computing   | 40  | 60        | 100   |
| 39 | III | Elective III       | Paper-3     | 5  | 3  | 1. Software Engineering<br>2. E-Commerce                    | 25  | 75        | 100   |
| 40 | III | Elective IV        | Paper-4     | 5  | 3  | 1. Design and analysis of Algorithms<br>2. Computer Network | 25  | 75        | 100   |
| 41 | IV  | Skill Based        | Practical-4 | 2  | 2  | Multimedia  | -   | 50        | 50    |
| 42 |     | Extension activity |             | -  | 3  |   | 100 | -         | 100   |
|    |     | TOTAL              |             | 30 | 25 |   | 280 | 470       | 750   |

**Mini Project during summer vocation with an extra credit = 1**

**TOTAL CREDITS****B.Sc [COMPUTER SCIENCE]**

| <b>PART</b> | <b>SUBJECT</b>                      | <b>PAPERS</b> | <b>CREDIT</b> | <b>TOTAL CREDITS</b> | <b>MARKS</b> | <b>TOTAL MARKS</b> |
|-------------|-------------------------------------|---------------|---------------|----------------------|--------------|--------------------|
| Part I      | Languages                           | 4             | 4             | 16                   | 100          | 400                |
| Part II     | English                             | 4             | 4             | 16                   | 100          | 400                |
| Part III    | Allied                              | 4             | 5             | 20                   | 100          | 400                |
| Part III    | Elective                            | 4             | 3             | 12                   | 100          | 400                |
| Part III    | Core                                | 8             | 4             | 32                   | 100          | 800                |
| Part III    | Core Practical                      | 8             | 3             | 24                   | 100          | 800                |
| Part IV     | EVS                                 | 1             | 2             | 2                    | 100          | 100                |
| Part IV     | Value Education                     | 1             | 2             | 2                    | 50           | 50                 |
| Part IV     | Skill Based (Theory-1, Practical-3) | 4             | 2             | 8                    | 50           | 200                |
| Part IV     | Non-Major                           | 2             | 2             | 4                    | 50           | 100                |
| Part IV     | Soft Skill                          | 1             | 1             | 1                    | 50           | 50                 |
| Part V      | Extension Activities                | -             | 3             | 3                    | 100          | 100                |
|             | <b>Total</b>                        | <b>41</b>     |               | <b>140</b>           |              | <b>3800</b>        |



## ALLIED MATHEMATICS-I

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| I        |              | Allied   | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 5      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

### COURSE OBJECTIVES

- To provide a sound foundation in basic concepts of Mathematics
- To help the students to develop their knowledge in Mathematical concepts and their applications

### COURSE OUTCOMES

| CO Number | CO Statement   | Knowledge Level(K1-K4) |
|-----------|--|------------------------|
| CO1       | To find the expansion of various types of series         | K1                     |
| CO2       | To solve the equations and to find roots                 | K2                     |
| CO3       | To learn about the types of matrices                     | K3                     |
| CO4       | To expand trigonometric functions                        | K4                     |
| CO5       | To apply the concepts of Cartesian and Polar coordinates | K3                     |

*Knowledge Level: K1-Remember, K2-Understand, K3-Apply, K4-Analyze*

### MAPPING WITH PROGRAM OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | M   | M   | M   |
| CO2 | S   | S   | M   | M   | S   | M   |
| CO3 | S   | S   | M   | M   | S   | S   |
| CO4 | S   | M   | M   | S   | M   | M   |
| CO5 | S   | M   | M   | M   | S   | S   |

*S- Strong      M – Medium      L – Low*

### UNIT- I-ALGEBRA

**18 Hrs**

Partial fractions - Binomial, Exponential and logarithmic Series (without proof) - Summation and Approximation - Simple Problems.

### UNIT- II-THEORY OF EQUATIONS

**18 Hrs**

Polynomial Equations with real Coefficients - Irrational roots - Complex roots - Symmetric functions of roots - Transformation of equation by increasing or decreasing roots by a constant Reciprocal equations - Newton's method to find a root approximately - Simple problems.

**UNIT – III- MATRICES****18Hrs**

Symmetric - Skew - Symmetric - Orthogonal and Unitary matrices –Rank of a Matrix- Eigen roots and Eigen vectors - Cayley - Hamilton theorem (without proof) - Verification and computation of inverse matrix.

**UNIT - IV- TRIGONOMETRY****18Hrs**

Expansions of  $\sin^n \theta$ ,  $\cos^n \theta$ ,  $\sin n\theta$ ,  $\cos n\theta$ ,  $\tan n\theta$  Expansions of  $\sin \theta$ ,  $\cos \theta$ ,  $\tan \theta$  in terms of  $\theta$  - Hyperbolic and inverse hyperbolic functions.

**UNIT - V- DIFFERENTIAL CALCULUS****18 Hrs**

$n^{\text{th}}$  derivatives - Leibnitz's theorem (without proof) and applications - Jacobians - Concepts of polar Co-ordinates -Curvature and radius of curvature in Cartesian Co- ordinates (without Proof) Simple Problems.

**DISTRIBUTION OF MARKS: THEORY 10% AND PROBLEMS 90%****TEACHING METHODOLOGY**

1. Class room teaching
2. Giving Assignments for all units
3. Discussions
4. Home test
5. PPT presentation

**TEXT BOOKS**

| S.NO | AUTHORS                                 | TITLE                          | PUBLISHERS                       | YEAR OF PUBLISHING |
|------|---|--------------------------------|----------------------------------|--------------------|
| 1    | P. Duraipandian and<br>S. Udayabaskaran | Allied mathematics<br>Vol I&II | Muhil<br>Publishers -<br>chennai | 1997               |

**REFERENCE BOOKS:**

| S.NO | AUTHORS                                     | TITLE                             | PUBLISHERS                          | YEAR OF PUBLISHING |
|------|---|-----------------------------------|-------------------------------------|--------------------|
| 1    | P.Balasubramanian<br>and<br>K.G.Subramanian | Ancillary<br>mathematics vol I&II | Tata McGraw<br>Hill-New Delhi       | 1997               |
| 2    | P.R.Vittal                                  | Allied Mathematics                | Margham<br>publications,<br>Chennai | 2003               |

## WEB SOURCES

1. <https://www.schandpublishing.com/books/higher-education/mathematics-paper-i-1st-semester/9788121923231/>
2. [https://www.ikbooks.com/home/samplechapter?filename=165\\_Sample-Chapter.pdf](https://www.ikbooks.com/home/samplechapter?filename=165_Sample-Chapter.pdf)

## SYLLABUS DESIGNER

1. Mrs.V. VandarKuzhali, Assistant Professor of Mathematics
2. Mrs.C. Revathi, Assistant Professor of Mathematics

## ALLIED MATHEMATICS-II

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| II       |              | Allied   | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 5      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

## COURSE OBJECTIVES

- The objective of this course is to provide the basic knowledge in Mathematics to solve the problems.
- To explore the Fundamental concepts of Mathematics.

## COURSE OUTCOMES

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | To apply Bernoulli's formula   | K1                      |
| CO2       | To have practical knowledge in the evaluation of double and triple integrals | K3                      |
| CO3       | To determine the four standard types of PDE                                  | K4                      |
| CO4       | To deepen the knowledge in Laplace transforms                                | K2                      |
| CO5       | To learn the basic concepts of Vector Analysis                               | K3                      |

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

## MAPPING OF COURSE OUTCOMES

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | M   | M   | M   |
| CO2 | S   | S   | S   | M   | S   | S   |
| CO3 | S   | S   | M   | M   | M   | M   |
| CO4 | S   | S   | S   | M   | S   | S   |
| CO5 | S   | S   | M   | M   | M   | M   |

S- Strong      M – Medium      L – Low

**UNIT - I: INTEGRAL CALCULUS****18 Hrs**

Bernoulli's formula for integration by parts - Reduction formulae  $\sin^n x$ ,  $\cos^n x$ ,  $\tan^n x$ ,  $\operatorname{cosec}^n x$ ,  $\sec^n x$ ,  $\cot^n x$ .- Properties of definite integral and simple problems.

**UNIT-II: APPLICATION OF INTEGRATION****18 Hrs**

Evaluation of double, triple integrals - simple applications to area and Volume - Fourier series for functions in  $[0, 2\pi]$  and  $[-\pi, \pi]$ .

**UNIT - III: PARTIAL DIFFERENTIAL EQUATIONS****18 Hrs**

Formation of complete integral and general integral - Four standard types-Lagrange's equation.

**UNIT - IV: LAPLACE TRANSFORMS****18 Hrs**

Laplace transformations of standard functions and simple properties - Inverse Laplace transform - Applications to solutions of linear differential equations of order 1 and 2 - Simple problems.

**UNIT - V: VECTOR ANALYSIS****18Hrs**

Scalar point function - Vector point functions - Vector Point functions - Gradient, Divergence, Curl - Directional derivatives - Unit to normal to a surface - Line, surface and Volume integrals - Green's theorems (Without proof) - Simple problems based on this theorem.

**DISTRIBUTION OF MARKS: THEORY 10% AND PROBLEMS 90%****TEACHING METHODOLOGY**

1. Class room teaching
2. Giving Assignments for all units
3. Discussions
4. Home test
5. PPT presentation

**TEXT BOOKS**

| S.NO | AUTHORS                              | TITLE                              | PUBLISHERS                              | YEAR OF PUBLICATION |
|------|--------------------------------------|------------------------------------|---|---------------------|
| 1    | P. Duraipandian and S. Udayabaskaran | Allied Mathematics volume I and II | Wesley Wiley Eastern Limited, New Delhi | 1975, II Edition    |

**REFERENCE BOOKS**

| S.NO | AUTHORS | TITLE | PUBLISHERS | YEAR OF PUBLICATION |
|------|---------|-------|------------|---------------------|
|      |         |       |            |                     |

|   |  |                                       |                                      |      |
|---|--|---------------------------------------|--------------------------------------|------|
| 1 | P. Balasubramanian<br>and<br>K.G.Subramanian | Ancillary<br>Mathematics<br>Vol.I& II | Tata McGraw<br>Hill, New<br>Delhi.   | 1997 |
| 2 | S.P. Rajagopalan and<br>R. Sattanathan       | Allied<br>Mathematics                 | Vikas<br>Publications,<br>New Delhi. | 2005 |

### WEB SOURCES

1. <https://www.copingwithcalculus.com>
2. [https://mathworld.wolfram.com>Laplace Transforms](https://mathworld.wolfram.com>Laplace%20Transforms)
3. <https://www.intmaths.com>vectors-intro>

### SYLLABUS DESIGNER

1. Dr.M. Kasthuri, Assistant Professor of Mathematics
2. Mrs. C. Revathi, Assistant Professor of Mathematics

## **DEPARTMENT OF MATHEMATICS- PG**

### **M.Sc MATHEMATICS**

#### **PROGRAMME EDUCATIONAL OBJECTIVES (PEO):**

**PEO 1:** To develop problem-solving skills and apply them independently to problems in pure and applied mathematics.

**PEO 2:** To develop abstract mathematical thinking.

#### **PROGRAMME OUTCOMES (PO):**

**PO 1:** Apply knowledge of Mathematics, in all the fields of learning including higher research and its extensions.

**PO 2:** Innovate, invent and solve complex mathematical problems using the knowledge of pure and applied mathematics.

**PO 3:** Explain the knowledge of contemporary issues in the field of Mathematics and applied sciences.

**PO 4:** Work effectively as an individual, and also as a member or leader in multi-linguistic and multi- disciplinary teams. Adjust themselves completely to the demands of the growing field of Mathematics by lifelong learning.

**PO 5:** Effectively communicate about their field of expertise on their activities, with their peer and society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations.

**PO 6:** Crack lectureship and fellowship exams approved by UGC like CSIR – NET and SET.

# MASTER OF SCIENCE (MATHEMATICS)

(With effect from 2019-2020)

| S.No        | Study Components |            | Hrs/Week | Credit | Title of the Paper                        | Max. Marks |     |       |
|-------------|------------------|------------|----------|--------|---|------------|-----|-------|
|             | Course Title     |            |          |        |   | C.A        | Sem | Total |
| SEMESTER I  |                  |            |          |        |   |            |     |       |
| 1           | Core             | Paper I    | 6        | 4      | Algebra - I                               | 25         | 75  | 100   |
| 2           | Core             | Paper II   | 6        | 5      | Real Analysis - I                         | 25         | 75  | 100   |
| 3           | Core             | Paper III  | 6        | 5      | Ordinary Differential Equations           | 25         | 75  | 100   |
| 4           | Core             | Paper IV   | 6        | 5      | Mechanics                                 | 25         | 75  | 100   |
| 5           | Elective I       | Paper I    | 6        | 3      | Graph Theory                              | 25         | 75  | 100   |
| 6           | Self Study Paper |            | -        | 2      | Skill Enhancement in Algebra and Analysis | -          | -   | -     |
| Total       |                  |            | 30       | 24     |   | 125        | 375 | 500   |
| SEMESTER II |                  |            |          |        |   |            |     |       |
| 7           | Core             | Paper V    | 5        | 4      | Algebra - II                              | 25         | 75  | 100   |
| 8           | Core             | Paper VI   | 6        | 5      | Real Analysis - II                        | 25         | 75  | 100   |
| 9           | Core             | Paper VII  | 6        | 5      | Partial Differential Equations            | 25         | 75  | 100   |
| 10          | Core             | Paper VIII | 6        | 5      | Differential Geometry                     | 25         | 75  | 100   |

|              |                  |            |    |    |                         |     |     |     |
|--------------|------------------|------------|----|----|-------------------------|-----|-----|-----|
| 11           | Elective II      | Paper II   | 5  | 3  | Operations Research     | 25  | 75  | 100 |
| 12           | Compulsory Paper |            | 2  | 2  | Human Rights            | 25  | 75  | 100 |
|              | Total            |            | 30 | 24 |                         | 150 | 450 | 600 |
| SEMESTER III |                  |            |    |    |                         |     |     |     |
| 13           | Core             | Paper IX   | 6  | 4  | Complex Analysis-I      | 25  | 75  | 100 |
| 14           | Core             | Paper X    | 6  | 5  | Calculus of Variations  | 25  | 75  | 100 |
| 15           | Core             | Paper XI   | 6  | 5  | Topology                | 25  | 75  | 100 |
| 16           | Core             | Paper XII  | 6  | 5  | Probability Theory      | 25  | 75  | 100 |
| 17           | Elective III     | Paper III  | 6  | 3  | Numerical Analysis      | 25  | 75  | 100 |
| 18           | Self Study Paper |            | -  | 2  | MATLAB                  | -   | -   | -   |
| Total        |                  |            | 30 | 24 |                         | 125 | 375 | 500 |
| SEMESTER IV  |                  |            |    |    |                         |     |     |     |
| 19           | Main             | Paper XIII | 6  | 4  | Complex Analysis-II     | 25  | 75  | 100 |
| 20           | Main             | Paper XIV  | 6  | 5  | Mathematical Statistics | 25  | 75  | 100 |

|              |   |          |           |           |                      |            |            |            |
|--------------|---|----------|-----------|-----------|----------------------|------------|------------|------------|
| 21           | Main  | Paper XV | 6         | 5         | Functional Analysis  | 25         | 75         | 100        |
| 22           | Elective IV                                 | Paper IV | 6         | 3         | Difference Equations | 25         | 75         | 100        |
| 23           | <b>Project with Viva Voce( Using Latex)</b> |          | 6         | 5         | -                    | 25         | 75         | 100        |
| <b>Total</b> |   |          | <b>30</b> | <b>22</b> |                      | <b>125</b> | <b>375</b> | <b>500</b> |

#### CONSOLIDATED STATEMENT

| Subject          | Papers    | Hours      | Credit | Total Credits | Marks | Total marks |
|------------------|-----------|------------|--------|---------------|-------|-------------|
| Core             | 15        | 89         | 4-5    | 71            | 100   | 1500        |
| Elective         | 4         | 23         | 3      | 12            | 100   | 400         |
| Compulsory       | 1         | 2          | 2      | 2             | 100   | 100         |
| Project          | 1         | 6          | 5      | 5             | 100   | 100         |
| Self Study Paper | 2         | -          | 2      | 4             | -     | -           |
| Total            | <b>23</b> | <b>120</b> |        | <b>94</b>     |       | <b>2100</b> |



## ALGEBRA-I

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| I        |              | Core     | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 4      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

### COURSE OBJECTIVES

- To introduce the concept of class equation, solvability of groups, finite abelian groups, linear transformations and real quadratic forms.
- To develop the knowledge on trace and transpose, Jordan forms.

### COURSE OUTCOMES:

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To explain the Sylow's theorem  | K2                      |
| CO2       | To provide information on fields, vector spaces and modules                                       | K3                      |
| CO3       | To explain and evaluate the concept of canonical transformations such as triangular and nilpotent | K4                      |
| CO4       | To apply the Jordan form and rational canonical form for problem solving                          | K3                      |
| CO5       | To analyze the topics Trace, Transpose, Hermitian etc.  | K4                      |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

### MAPPING OF COURSE OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | M   | S   | M   |
| CO2 | M   | S   | M   | S   | M   | S   |
| CO3 | S   | M   | S   | M   | M   | S   |
| CO4 | S   | M   | M   | M   | M   | M   |
| CO5 | S   | S   | S   | M   | S   | M   |

S- Strong; M-Medium; L-Low

### UNIT - I - GROUP THEORY

**18hrs**

Another Counting Principle –Class Equation for Finite groups and its applications – Sylow's theorems [For theorem 2.12.1, Only First proof].

**Chapter 2: Sections 2.11 and 2.12** [omit Lemma 2.11.3, 2.12.2, 2.12.5]

**UNIT - II - GROUPS****18hrs**

Direct products – Finite abelian groups – Modules

**Chapter 5: Section 5.7 [Lemma 5.7.1, Lemma 5.7.2 theorem 5.7.1]****Chapter 2: Sections 2.13 and 2.14 [only theorem 2.14.1]****Chapter 4: Section 4.5****UNIT-III: LINEAR TRANSFORMATIONS****18hrs**

Linear Transformations: Canonical forms- Triangular form- Nilpotent transformations.

**Chapter 6: Sections 6.4, 6.5****UNIT-IV: LINEAR TRANSFORMATIONS****18hrs**

Jordan form- rational canonical form, Trace and transpose

**Chapter 6: Sections 6.6, 6.7, 6.8****UNIT-V: LINEAR TRANSFORMATIONS****18hrs**

Hermitian, Unitary, Normal transformation, Real Quadratic forms.

**Chapter 6: Sections 6.10 and 6.11[Omit 6.9]****DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%.****TEXT BOOKS:**

| S.NO | AUTHORS      | TITLE             | PUBLISHERS                              | YEAR OF PUBLICATION |
|------|--------------|-------------------|---|---------------------|
| 1.   | I.N.Herstein | Topics in Algebra | Wesley Wiley Eastern Limited, New Delhi | 1975, II Edition    |

**REFERENCE BOOKS:**

| S.NO     | AUTHORS                                     | TITLE                                      | PUBLISHERS                         | YEAR OF PUBLICATION |
|----------|---|--|------------------------------------|---------------------|
| <b>1</b> | M.Artin                                     | Algebra                                    | Prentice Hall of India             | 1991                |
| <b>2</b> | P.B.Bhattacharya, S.K.Jain, and S.R.Nagpaul | Basic Abstract Algebra                     | Cambridge University Press         | 1997                |
| <b>3</b> | Rudin, W I.S. Luther and I.B.S.Passi        | . Algebra, Vol. I- Groups and Vol.II Rings | Narosa Publishing House, New Delhi | 1999.               |

**Web Sources:**

1. [Abstact.ups.edu>aata-20160809](http://Abstact.ups.edu>aata-20160809).

**Teaching Methodology**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

**SYLLABUS DESIGNER:**

1. Mrs.G.Chitra, Assistant Professor of Mathematics.
2. Dr.M.Kasthuri, Assistant Professor of Mathematics.

**REAL ALAYSIS-I**

| Semester | Subject Code | Category | Lecture      |             | Theory       |             | Practical | Credit |
|----------|--------------|----------|--------------|-------------|--------------|-------------|-----------|--------|
| I        |              | Core     | Hrs/<br>week | Hrs/<br>Sem | Hrs/<br>week | Hrs/<br>Sem | 0         | 5      |
|          |              |          | 6            | 90          | 6            | 90          |           |        |

**Course Objectives:**

1. This course aims to provide students with the specialist knowledge necessary for basic concepts in Real Analysis. More precisely, it strives to enable students to learn basic concepts about functions of bounded variation, grasp basic concepts about the total variation, learn about Riemann-Stieltjes integrals, sequences and series of functions.
2. We introduce a stronger notion of convergence of functions than pointwise convergence, called uniform convergence. The difference between pointwise convergence and uniform convergence is analogous to the difference between continuity and uniform continuity.

**Course Outcomes:**

| CO<br>Number | CO Statement | Knowledge<br>Level<br><br>(K1-K4) |
|--------------|--------------|-----------------------------------|
|--------------|--------------|-----------------------------------|

|     |  |    |
|-----|--|----|
| CO1 | We consider algebraic properties as well as more abstract properties such as realizing that every function of bounded variation can be written as the difference of two increasing functions.  | K4 |
| CO2 | We examine the definition of the Riemann-Stieltjes integral and see when functions of bounded variation are Riemann-Stieltjes integrable.  | K2 |
| CO3 | Both infinite series and infinite products could potentially be helpful in the area of approximation of functions. Infinite series represent a traditional instrument in contemporary mathematics. One of its classical implementations is the representation of functions, which is applicable to different areas of mathematical analysis. | K2 |
| CO4 | The focus in the present volume is on just one of many possible implementations of infinite products, namely the representation of elementary functions.   | K2 |
| CO5 | This chapter explores several ways that sequences of functions can converge to another function.   | K3 |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

#### **Mapping of Program Outcomes:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | S          | S          | M          |
| <b>CO2</b> | M          | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | M          | S          | M          | S          | S          |
| <b>CO4</b> | M          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

S- Strong; M-Medium; L-Low

#### **UNIT- I - FUNCTIONS OF BOUNDED VARIATION**

**18 Hrs**

Introduction - Properties of monotonic functions - Functions of bounded variation - Total Variation - Additive property of total variation - Total variation on  $[a, x]$  as a function of  $x$  – Functions of bounded variation expressed as the difference of increasing functions – Continuous functions of bounded variation-Curves and paths-Additive and Continuity Properties of arc length-Equivalence of paths , Change of parameters.

**Section : 6.1 - 6.12****UNIT- II - THE RIEMANN- STIELTJES INTEGRAL****18 Hrs**

Introduction – Notation – The definition of the Riemann – Stieltjes integral – Linear properties – Integration by parts – Change of variable in a Riemann – Stieltjes integral – Reduction to a Riemann Integral – Euler’s summation formula – Monotonically increasing integrators, Upper and lower integrals – Additive and linearity properties of upper and lower integrals – Riemann’s condition – Comparison theorems.

**Section 7.1 - 7.7 and 7.10 - 7.14****UNIT - III - THE RIEMANN-STIELTJES INTEGRAL****18 Hrs**

Integrators of Bounded Variation – Sufficient conditions for existence of Riemann-Stieltjes Integrals- Necessary conditions for existence of Riemann-Stieltjes integrals – Mean value theorems for Riemann – Stieltjes integrals – The integral as a function of the interval – Second fundamental theorem of integral calculus – Change of variable in a Riemann integral – Second Mean Value Theorem for Riemann integrals – Riemann – Stieltjes Integrals depending on a parameter – Differentiation under the integral sign -Inter changing the order of Integration – Lebesgue’s criterion for existence of Riemann integrals

**Section: 7.15 - 7.26****UNIT- IV - INFINITE SERIES AND INFINITE PRODUCTS****18Hrs**

Double sequences – Double series – Rearrangement theorem for double series – A sufficient condition for equality of iterated series – Multiplication of series – Cesaro summability – Infinite products.

**Section: 8.16 - 8.26****UNIT- V- SEQUENCE OF FUNCTIONS****18 Hrs**

Point wise convergence of sequence of functions – Examples of sequences of real – Valued functions – Definition of uniform convergence – Uniform convergence and continuity – The Cauchy condition for uniform convergence – Uniform Convergence of infinite series of functions- Uniform convergence and Reimann – Stieltjes integration – Nonuniformly convergent sequence that can be integrated term by term– uniform convergence and Differentiation – Sufficient conditions for uniform convergence of a series – Mean convergence -Power Series – Multiplication of power series – The Taylor’s series generated by a function- Bernstein’s theorem- The binomial series – Abel’s limit theorem – Tauber’s theorem

**Section: 9.1 - 9.6 and 9.14 - 9.23****Distribution of Marks: Theory 100%**

**Text Books:**

| S.No | AUTHORS           | TITLE                    | PUBLISHERS                                 | YEAR<br>OF<br>PUBLICATION |
|------|-------------------|--------------------------|--|---------------------------|
| 1    | Tom M.<br>Apostol | Mathematical<br>Analysis | Wesley Publishing Company Inc,<br>New York | 1974                      |

**Reference Books:**

| S.No | AUTHORS                      | TITLE                                  | PUBLISHERS                         | YEAR<br>OF<br>PUBLICATION |
|------|------------------------------|--|------------------------------------|---------------------------|
| 1    | Burkill, J.C                 | The Lebesgue Integral                  | Cambridge University<br>Press      | 1951                      |
| 2    | Munroe, M.E                  | Measure and Integration                | Wesley, Mass                       | 1971                      |
| 3    | Roydon, H.L                  | Real Analysis                          | Company, New York                  | 1988                      |
| 4    | Rudin, W and<br>Savita Arora | Principles of<br>Mathematical Analysis | McGraw Hill Company,<br>New York   | 1979.                     |
| 5    | Malik, S.C                   | Mathematical Analysis                  | Wiley Eastern Limited,<br>New York | 1991                      |

**Web sources:**

<https://www.scribd.com/doc/19250862/Chap-07-Real-Analysis-Functions-of-Bounded-Variation>

<https://math.stackexchange.com/questions/206848/derivation-of-riemann-stieltjes-integral>

<http://www.springer.com/978-0-8176-8279-8>

<http://www.math.iitb.ac.in/~srg/courses/ma403-2008/uniconv.pdf>

<http://math.louisville.edu/~lee/ira/IntroRealAnal-ch09.pdf>

**TEACHING METHODOLOGY:**

1. Black Board Teaching
2. Smart Board Teaching
3. Giving Assignments in each Unit.

4. Class Room Discussion and Seminars.

5. PPT Presentations.

### SYLLABUS DESIGNERS

1. K. Kavitha Assistant Professor of Mathematics

2. K Geetha Priya, Assistant Professor of Mathematics

### ORDINARY DIFFERENTIAL EQUATIONS

| Semester | Subject Code | Category | Lecture  |         | Theory | Practical | Credit |
|----------|--------------|----------|----------|---------|--------|-----------|--------|
|          |              |          | Hrs/Week | Hrs/Sem |        |           |        |
| I        |              | Core     | 6        | 90      | 6      | 0         | 5      |

#### COURSE OBJECTIVES:

- To develop strong background on finding solutions to linear differential equations with constant and variable coefficients and also with singular points
- To study existence and uniqueness of the solutions of first order differential equations.

#### COURSE OUTCOMES:

| CO Number | CO Statement   | Knowledge Level(K1-K4) |
|-----------|--|------------------------|
| CO1       | To obtain solutions of the Homogenous equation with constant co-efficient and Homogenous equation with analytic co-efficient and using Wronskian to find a solution of the problems. | K2                     |
| CO2       | To obtain the solution of Homogenous and Non-homogenous equation of order n and also to find the solution of non-homogenous equation using Annihilator method.                       | K3                     |
| CO3       | To solve Initial value problems and to derive the homogenous equation with analytic coefficient and also obtain the solution of Legendre equation and related problems.              | K4                     |
| CO4       | To comprehend the Euler equations, the Bessel equation and second order equations with regular singular points.  | K2                     |
|           | To analyze the problems in Exact equation and method of  |                        |

|     |   |    |
|-----|---|----|
| CO5 | convergence of the successive approximations and study about Lipschitz condition. | K3 |
|-----|---|----|

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

#### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| CO1        | S          | M          | M          | S          | M          | S          |
| CO2        | M          | M          | S          | M          | S          | M          |
| CO3        | S          | S          | S          | M          | S          | S          |
| CO4        | M          | M          | M          | M          | M          | S          |
| CO5        | S          | M          | S          | S          | S          | M          |

S- Strong; M- Medium; L- Low

#### **UNIT I - LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS    18 hrs**

Second order homogeneous equations – Initial value problems – Linear dependence and independence – Wronskian and a formula for Wronskian – Non – homogeneous equation of order two.

##### **Chapter - 2: Sections 1 to 6.**

#### **UNIT II - LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS    18 hrs**

Homogeneous and non – Homogeneous equation of order n – Initial value problems – Annihilator method to solve non – homogeneous equation – Algebra of constant coefficient operators.

##### **Chapter- 2: Sections 7 to 12.**

#### **UNIT III - LINEAR EQUATIONS WITH VARIABLE COEFFICIENTS:    18 hrs**

Initial value Problems – Existence and uniqueness theorems – Solutions to solve a non – homogeneous equation – Wronskian and linear dependence – reduction of the order of a homogenous equation – homogeneous equation with analytic coefficients – The Legendre equation.

##### **Chapter- 3: Sections 1 to 8 [Omit Section 9]**

#### **UNIT IV - LINEAR EQUATIONS WITH REGULAR SINGULAR POINTS: 18 hrs**

Euler equation – Second order equations with regular singular points – Exceptional cases – Bessel Function.

##### **Chapter – 4: Sections 1 to 4 and 6 to 8 [Omit sections 5 and 9 ]**



**UNIT V - EXISTENCE AND UNIQUENESS OF SOLUTIONS TO FIRST ORDER EQUATIONS:  
18 hrs**

Equation with variable separable – Exact equation – method of successive approximations – the Lipschitz condition – convergence of the successive approximations and the existence theorem.

**Chapter – 5: Sections 1 to 6 [ Omit sections 7 to 9 ].**

**DISTRIBUTION OF MARKS: THEORY 70% AND PROBLEMS 30%.**

**TEXT BOOK:**

| S.No | AUTHORS         | TITLE  | PUBLISHERS                                | YEAR OF PUBLICATION |
|------|-----------------|--|---|---------------------|
| 1    | E.A. Coddington | An Introduction to ordinary differential equations | Prentice – Hall of India Ltd., New Delhi, | 1987.               |

**REFERENCE BOOKS:**

| S.No. | AUTHORS                                   | TITLE   | PUBLISHERS                          | YEAR OF PUBLICATION |
|-------|---|---|-------------------------------------|---------------------|
| 1     | Williams E. Boyce and Richard C. Di Prima | Elementary differential equations and boundary value problems | , John Wiley and sons, New York     | 1967                |
| 2     | George F Simmons                          | Differential equation with applications and historical notes  | Tata McGraw Hill, New Delhi         | 1974                |
| 3     | N.N. Lebedev                              | Special functions and their application                       | Prentice Hall of India, New Delhi   | 1965                |
| 4     | W.T. Reid                                 | Ordinary Differential Equations,                              | John Wiley and Sons, New York       | 1971                |
| 5     | M.D.Raisinghania                          | Advanced Differential Equations                               | S.Chand & Company Ltd. New Delhi    | 2001                |
| 6     | B.Rai, D.P.Choudary and H.I Freedman      | A Course in Ordinary Differential Equations,                  | Narosa Publishing House, New Delhi, | 2002                |

**WEB SOURCES:**

1. [http://www.amazon.com/Ordinary-differential-equation-Dover-Mathematics/dp/6486649407/ref=](http://www.amazon.com/Ordinary-differential-equation-Dover-Mathematics/dp/6486649407/ref=sr_1_1?)  
[sr 1 1?](http://www.amazon.com/Ordinary-differential-equation-Dover-Mathematics/dp/6486649407/ref=sr_1_1?)

2. [https://open.umn.edu/open text books/text books/ Ordinary-differential-equation](https://open.umn.edu/open_text_books/text_books/Ordinary-differential-equation)

**TEACHING METHODOLOGY:**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations.

**SYLLABUS DESIGNER:**

1. B. Vijayalakshmi, Assistant Professor of Mathematics.

**MECHANICS**

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
|          |              |          | Hrs/Week | Hrs/Sem | Hrs/Week | Hrs/Sem |           |        |
| I        |              | Core     | 6        | 90      | 6        | 90      | 0         | 5      |

**COURSE OBJECTIVES:**

- To develop the knowledge of mechanical systems under generalized co-ordinates systems, virtual work, energy and momentum
- To study mechanics developed by Newton, Lagrange, Hamilton, Jacobi and theory of relativity due to Einstein

**COURSE OUTCOMES:**

| CO Number | CO Statement  | Knowledge Level(K1-K4) |
|-----------|---|------------------------|
| CO1       | To acquire the knowledge about configuration space, generalized co-ordinates and virtual work | K2                     |
| CO2       | To apply Lagrange's equation to solve complex mechanical problems in effective manner         | K3                     |
| CO3       | To explain the Hamiltonian formulation of a mechanical system                                 | K3                     |
| CO4       | To identify, explain and evaluate the Jacobi equation and separability                        | K4                     |
| CO5       | To analyze the Canonical transformations  | K4                     |

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

**MAPPING WITH PROGRAMME OUTCOMES:**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | S   | S   | M   |
| CO2 | M   | S   | M   | S   | S   | M   |
| CO3 | S   | S   | M   | S   | M   | S   |
| CO4 | M   | M   | S   | S   | M   | S   |
| CO5 | M   | S   | S   | M   | S   | S   |

S- Strong, M – Medium, L - Low

**UNIT – I - MECHANICAL SYSTEMS****18 hrs**

The mechanical systems – Generalized co-ordinates – Constraints – Virtual work – Energy and Momentum

**Chapter 1: Section: 1.1 to 1.5****UNIT – II - LAGRANGE'S EQUATIONS****18 hrs**

Derivation of Lagrange's equations – Examples – Integrals of motion.

**Chapter 2: Section: 2.1 to 2.3****UNIT – III - HAMILTON'S EQUATIONS****18 hrs**

Hamilton's Principle – Hamilton's equations – Other Variational Principle.

**Chapter 4: Section: 4.1 to 4.3****UNIT – IV - HAMILTON'S – JACOBI THEORY****18 hrs**

Hamilton's Principle Function – Hamilton – Jacobi Equation – Separability

**Chapter 5: Section: 5.1 to 5.3****UNIT – V - CANONICAL TRANSFORMATION****18 hrs**

Differential forms and Generating functions – Special Transformations – Lagrange and Poisson brackets

**Chapter 6: Section: 6.1 to 6.3**

**DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%**

**TEXT BOOK:**

| S.NO | AUTHORS     | TITLE              | PUBLISHERS                        | YEAR OF PUBLICATION |
|------|-------------|--------------------|-----------------------------------|---------------------|
| 1.   | D.Greenwood | Classical Dynamics | Prentice Hall of India, New Delhi | 1985                |

**REFERENCE BOOKS:**

| S.NO | AUTHORS                 | TITLE               | PUBLISHERS   | YEAR OF PUBLICATION |
|------|-------------------------|---------------------|--|---------------------|
| 1.   | H.Goldstein             | Classical Mechanics | [2 <sup>nd</sup> edition]Narosa publishing house-New Deihi | -                   |
| 2.   | N.C.Rane and P.S.C.Joag | Classical Mechanics | Tata McGraw Hill   | 1991                |

**WEB SOURCES:**

1. <https://www.springer.com>journal>
2. <https://revisionmaths.com/advanced-level-maths-revision/advanced-level-mechanics>

**TEACHING METHODOLOGY:**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

**SYLLBUS DESIGNERS:**

3. Mrs. V. Vandar Kuzhali , Assistant Professor Of Mathematics
4. Mrs. C. Revathi, Assistant Professor Of Mathematics

**GRAPH THEORY****COURSE OBJECTIVES:**

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| I        |              | Elective | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 3      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

- Graph Theory is an integral part of Discrete Mathematics and has applications in diversified areas such as Electrical Engineering, Computer science, Linguistics.
- In this course basic concepts of Graph theory such as Trees, Eulerian Graphs, Matching, Vertex colorings, Edge colorings, Planarity, are introduced.

**COURSE OUTCOMES:**

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K1-K4)</b> |
|------------------|---|--------------------------------|
| CO1              | To acquire the basic knowledge of graphs namely cut vertex , bridge, blocks of graph. | K2                             |
| CO2              | To determine the properties of trees and connectivity                                 | K3                             |
| CO3              | To justify Eulerian graphs and Hamiltonian graphs                                     | K3                             |
| CO4              | To discuss the importance of Matchings and Colorings                                  | K4                             |
| CO5              | To apply the concept of Planarity including Euler identity                            | K3                             |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze*

**MAPPING OF PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| CO1        | S          | M          | S          | M          | S          | M          |
| CO2        | M          | S          | M          | M          | S          | M          |
| CO3        | S          | S          | M          | S          | M          | S          |
| CO4        | M          | M          | S          | S          | M          | S          |
| CO5        | M          | S          | S          | M          | S          | S          |

S- Strong; M-Medium; L-Low

**UNIT-I -GRAPHS, SUB GRAPHS AND TREES****18hrs**

Graph– graph isomorphism and simple graph - the Incidence and adjacency matrices- sub graph – vertex degrees- paths and connection – cycles –trees – cut edges and bonds – cut vertices.

**Chapter 1 [section 1.1 to 1.7]****Chapter 2 [section 2.1 to 2.3]****UNIT - II - CONNECTIVITY EULER’S TOURS AND HAMILTON CYCLES****18hrs**

Connectivity – Blocks – Euler tours – Hamilton cycles.

**Chapter 3 [section 3.1 to 3.2]****Chapter 4[section 4.1 to 4.2]****UNIT - III - MATCHINGS, EDGE COLORINGS****18hrs**

Matching’s- Matching’s and coverings in Bi partite graphs – Edge chromatic number – Vizing’s theorem.

**Chapter 5 [section 5.1 - 5.2]****Chapter 6 [section 6.1 - 6.2]**

**Unit – IV - INDEPENDENT SETS AND CLIQUES, VERTEX COLORINGS****18hrs**

Independent sets – Ramsey’s theorem- chromatic number – Brooks’ theorem – chromatic polynomials.

**Chapter 7[section 7.1 – 7.2]****Chapter 8 [section 8.1-8.2, 8.4]****Unit-V - PLANAR GRAPHS****18hrs**

Plane and planar graphs – dual graphs – Euler’s formula – the five color theorem and four color conjecture.

**Chapter 9 [section 9.1 – 9.3, 9.6]****DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%****TEXT BOOKS:**

| S.No | AUTHORS                    | TITLE                         | PUBLISHERS | YEAR OF PUBLICATION |
|------|----------------------------|-------------------------------|------------|---------------------|
| 1    | J.A Bondy and U.S.R Murthy | Graph theory and applications | McMillan   | 1976                |

**REFERENCE BOOKS:**

| S.No | AUTHORS                | TITLE                          | PUBLISHERS                 | YEAR OF PUBLICATION |
|------|------------------------|--------------------------------|----------------------------|---------------------|
| 1    | J.Clark and D.A Holton | A first look at Graph theory   | Allied publishers          | 1995                |
| 2    | R.Gould                | Graph theory                   | Benjamin Cummings          | 1989                |
| 3    | A.Gibbons              | Algorithmic Graph Theory       | Cambridge University Press | 1989                |
| 4    | R.J. Wilson            | Introduction to Graph Theory   | Pearson Education          | 2004                |
| 5    | S.A. Choudum           | A First Course in Graph Theory | MacMillan India Ltd        | 1987                |

**WEB SOURCES:**

<https://iversity.org/blog/introduction-graph-theory/>  
<http://www.hamilton.ie/ollie/Downloads/Graph.pdf>

**TEACHING METHODOLOGY**

1. Class room Teaching
2. Assignments
3. Seminars

4. Discussions

5 .PPT Presentations

**SYLLABUS DESIGNER:**

3. Mrs. R Ramya, Assistant Professor of Mathematics.

4. Mrs.G.Chitra, Assistant Professor of Mathematics.

**ALGEBRA-II**

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| II       |              | Core     | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 4      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

**COURSE OBJECTIVES**

- To study field extension, roots of Polynomial, Galois Theory, finite fields.
- Division rings, solvability by radical and to develop computational skill in abstract algebra

**COURSE OUTCOMES:**

| CO Number  | CO Statement   | Knowledge Level (K1-K4) |
|------------|--|-------------------------|
| <b>CO1</b> | To introduce the concept of Extension fields and Transcendence of $e$ .              | K3                      |
| <b>CO2</b> | To explain the relation between Roots of polynomials                                 | K2                      |
| <b>CO3</b> | To construct the Elements of Galois Theory   | K3                      |
| <b>CO4</b> | To discuss and understand the Wedderburn's theorem on finite division rings          | K2                      |
| <b>CO5</b> | To analyze the concept of Solvability by radicals, Integral Quaternions and the Four | K4                      |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

**MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| CO1        | S          | M          | S          | M          | S          | M          |
| CO2        | M          | S          | M          | M          | S          | M          |
| CO3        | S          | S          | M          | S          | M          | S          |
| CO4        | M          | M          | S          | S          | M          | S          |
| CO5        | M          | S          | S          | M          | S          | S          |

S- Strong; M-Medium; L-Low

**UNIT- I: FIELDS****18hrs**

Extension fields – Transcendence of  $e$  – Roots of polynomials.

**Chapter 5: Section 5.1 - 5.3.****UNIT-II: POLYNOMIALS****18hrs**

More about roots – Elements of Galois Theory.

**Chapter 5: Section 5.5 and 5.6****UNIT-III:SOLVABILITY AND EXTENSION FIELDS****18hrs**

Solvability by radicals – Galois Groups over the Rationals.

**Chapter 5: Section 5.7 and 5.8****UNIT- IV: FINITE FIELDS****18 hrs**

Finite fields – Wedderburn's theorem on finite division rings.

**Chapter 7: Section 7.1 and 7.2****UNIT- V: SELECTED TOPICS****18hrs**

A theorem of Frobenius – Integral Quaternions and the Four – Square theorem.

**Chapter 7: Section 7.3 and 7.4**

**DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%**

**TEXT BOOK:**

| <b>S.NO</b> | <b>AUTHORS</b> | <b>TITLE</b>                    | <b>PUBLISHERS</b>     | <b>YEAR OF PUBLICATION</b> |
|-------------|----------------|---------------------------------|-----------------------|----------------------------|
| 1.          | I.N.Herstein   | Topics in Algebra ( II Edition) | Wiley Eastern Limited | 1975                       |



**REFERENCE BOOKS:**

| S. N O | AUTHORS                                     | TITLE                  | PUBLISHERS             | YEAR OF PUBLICATION |
|--------|---|------------------------|------------------------|---------------------|
| 1.     | M. Artin                                    | Algebra                | Prentice Hall of India | 1991                |
| 2.     | P.B.Bhattacharya, S.K.Jain, and S.R.Nagpaul | Basic Abstract Algebra | Cambridge University.  | 1997                |

**WEB SOURCES:**

1. [http://lib1.org/\\_ads/680A08FE3A43250BF4683E477AB1997A](http://lib1.org/_ads/680A08FE3A43250BF4683E477AB1997A)
2. [http://lib1.org/\\_ads/8F9FA5C07895D22659815E5D415E3C84](http://lib1.org/_ads/8F9FA5C07895D22659815E5D415E3C84)

**TEACHING METHODOLOGY**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

**SYLLABUS DESIGNER:**

1. Mrs.G.Chitra, Assistant Professor of Mathematics.
2. Ms.S.Santhiya, Assistant Professor of Mathematics.

**REAL ANALYSIS – II**

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| II       |              | Core     | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 5      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

**COURSE OBJECTIVES**

- To introduce the concept of sequences and series of functions, Lebesgue measure and Lebesgue integration and to have a working knowledge on Multi-variable calculus.

- Measure on the real line, Lebesgue measurability and integrability, Fourier Series and Integrals.

### **COURSE OUTCOMES:**

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K1-K4)</b> |
|------------------|---|--------------------------------|
| CO1              | This course will develop an appreciation of the basic concepts of measure theory. Able to learn advanced the Lebesgue measure and Lebesgue integral with related problems.                                | K2                             |
| CO2              | Demonstrate understanding of the statement and proofs to Study the Stone-Weierstrass theorem and its applications.  | K3                             |
| CO3              | To understanding of the basic concepts underlying the definition of the general Lebesgue integral and Apply the theory of the course to solve a variety of problems at an appropriate level of difficulty | K2                             |
| CO4              | To Describe the Riemann integral and convergence of measure.  | K3                             |
| CO5              | To Apply the concept of Mean-value theorem for differentiable functions.  | K4                             |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

### **MAPPING OF COURSE OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| CO1        | S          | S          | M          | M          | S          | M          |
| CO2        | M          | S          | M          | S          | M          | S          |
| CO3        | S          | S          | S          | M          | M          | S          |
| CO4        | S          | M          | M          | M          | M          | M          |
| CO5        | S          | S          | S          | S          | S          | M          |

S- Strong; M-Medium; L-Low

**UNIT- I - THE LEBESGUE INTEGRAL****18hrs**

Introduction – The integral of a step function – Monotonic sequences of step functions – Upper functions and their integrals – Riemann integrable functions as examples of upper functions – The class of Lebesgue – integrable functions on a general interval – Basic properties of the Lebesgue integral – Lebesgue integration and sets of measure zero- The Levi monotone convergence theorems- The Lebesgue dominated convergence theorem – Lebesgue integrals on unbounded interval as limits of integrals as limits of integral on bounded intervals- Improper Riemann integrals.

**Chapter 10: section 10.1 to 10.13****UNIT- II - MEASURES THEORY AND INTEGRATION****18hrs**

Measurable functions – Continuity of function defined by Lebesgue integrals- Differentiation under the integral sign – Interchanging the order of integration- Measurable sets on the real line – The Lebesgue integral over arbitrary subsets of  $\mathbb{R}$  – Lebesgue integrals of complex- valued functions – Inner products and norms – The set  $L^2(I)$  of square- integrable functions – The sets  $L^2(I)$  as a semimetric space – A convergence theorem for series of functions in  $L^2(I)$  – The Riesz-Fischer theorem.

**Chapter 10: Sec 10.14 to 10.25****UNIT - III-FOURIER SERIES AND FOURIER INTEGRALS****18hrs**

Introduction – Orthogonal system of functions – The theorem on best approximation – The Fourier series of function relative to an orthonormal system – Properties of Fourier Coefficients – The Riesz – Fischer Theorem – The convergence and representation problems in trigonometric series – The Reimann – Lebesgue Lemma – The Dirichlet Integrals – An Integral representation for the partial sums of Fourier series – Reimann's localization theorem- Sufficient conditions for convergence of a Fourier Series at a particular point – Cesaro summability of Fourier series – Consequences of Fejer's theorem – The Weierstrass approximation theorem.

**Chapter 11: Section 11.1 to 11.15****UNIT- IV - MULTIVARIABLE DIFFERENTIAL CALCULUS****18hrs**

Introduction – The Directional derivative – Directional derivatives and continuity – The total derivative – The total derivative expressed in terms of partial derivatives – An application to complex- valued functions- The matrix of linear function – The Jacobian matrix – The chain rule – Matrix form of chain rule – The Mean – value Theorem for differentiable functions – A sufficient condition for differentiability – A sufficient condition for equality of mixed partial derivatives – Taylor's Formula for functions of  $\mathbb{R}^n$  to  $\mathbb{R}^1$

**Chapter 12: Section 12.1 to 12.14****UNIT- V - IMPLICIT FUNCTIONS AND EXTREMUM PROBLEMS****18 hrs**

Introduction-Functions with nonzero Jacobian determinant – The inverse function theorem – The Implicit function Theorem – Extrema of real valued functions of one variable- Extrema of real valued functions of several variables – Extremum problems with side conditions

## Chapter 13: Section 13.1 to 13.7

**DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%**

### TEXT BOOK:

| S.NO | AUTHORS        | TITLE                 | PUBLISHERS | YEAR OF PUBLICATION |
|------|----------------|-----------------------|------------|---------------------|
| 1.   | Tom M. Apostol | Mathematical Analysis | Wesley     | 1974                |

### REFERENCE BOOKS:

| S.NO | AUTHORS                      | TITLE                               | PUBLISHERS                 | YEAR OF PUBLICATION |
|------|------------------------------|-------------------------------------|----------------------------|---------------------|
| 1    | Burkill, J.C.                | The Lebesgue Integral               | Cambridge University Press | 1951.               |
| 2    | Malik, S.C. and Savita Arora | Mathematical Analysis               | Wiley Eastern Limited      | 1991.               |
| 3    | Rudin, W                     | Principles of Mathematical Analysis | McGraw Hill Company        | 1979.               |

### WEB SOURCES:

1. <https://www.iiserkol.ac.in/Measure-Integration-notes.pdf>
2. [https://www.amazon.in/Lebesgue Integration-notes.pdf](https://www.amazon.in/Lebesgue-Integration-notes.pdf)

### TEACHING METHODOLOGY

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

### SYLLABUS DESIGNER:

1. Ms.K.Geetha priya, Assistant Professor of Mathematics
2. Mrs.K.Kavitha, Assistant Professor of Mathematics

## PARTIAL DIFFERENTIAL EQUATIONS

| Semester | Subject Code | Category | Lecture  |         | Theory | Practical | Credit |
|----------|--------------|----------|----------|---------|--------|-----------|--------|
|          |              |          | Hrs/Week | Hrs/Sem |        |           |        |
| I        |              | Core     | 6        | 90      | 6      | 0         | 5      |

### COURSE OBJECTIVES:

- This course aims to acquaint the students with various mathematical techniques viz. Variable separable method, integral transform techniques
- Using Green's function approach so as to solve various boundary value problems involving parabolic, elliptic and hyperbolic differential equations which arise in many physical situations.

### COURSE OUTCOMES:

| CO Number | CO Statement  | Knowledge Level(K1-K4) |
|-----------|---|------------------------|
| CO1       | To obtain solutions of the partial differential equation in integral surfaces, orthogonal surfaces, compatible system, charpit method and canonical forms of partial differential equation. | K2                     |
| CO2       | To derive laplace and poisson equation, dirichlet and newmann problem for various co-ordinates.   | K3                     |
| CO3       | To obtain and form a solution of diffusion equation in cylindrical and spherical co-ordinates.  | K4                     |
| CO4       | To Comprehend the initial value problem and boundary value problem for two-dimensional wave equation and duhamel's Principle.   | K2                     |
| CO5       | To analyze the problems in green's Function for laplace equation, wave and diffusion equation.  | K3                     |

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

**MAPPING OF COURSE OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| CO1        | S          | M          | M          | S          | M          | S          |
| CO2        | M          | M          | S          | M          | S          | M          |
| CO3        | S          | S          | S          | M          | S          | S          |
| CO4        | M          | M          | M          | M          | M          | S          |
| CO5        | S          | M          | S          | S          | S          | M          |

S- Strong; M- Medium; L- Low

**UNIT I - PARTIAL DIFFERENTIAL EQUATIONS OF FIRST ORDER 18hrs**

Formation and solution of PDE – Integral surfaces – Cauchy problem order equation – Orthogonal surfaces – First order non – linear – Characteristics – Compatible system – Charpit method. Fundamentals: Classification and canonical forms of PDE.

**Chapter 0: 0.4 to 0.11 [Omit 0.1, 0.2, 0.3 and 0.11.1] and Chapter 1: 1.1 to 1.5**

**UNIT II - ELLIPTIC DIFFERENTIAL EQUATIONS 18hrs**

Derivation of Laplace and Poisson equation – BVP – Separation of Variables – Dirichlet's Problem and Neumann problem for a rectangle – Interior and exterior Dirichlet's problems for a circle – Interior Neumann problem for a circle – solution of Laplace equation in Cylindrical and spherical coordinates.

**Chapter 2: 2.1, 2.2, 2.5 to 2.12 [omit 2.3, 2.4 and 2.13]**

**UNIT III - PARABOLIC DIFFERENTIAL EQUATIONS 18hrs**

Formation and solution of Diffusion equation – Dirac – Delta function- Separation of variables method – Solution of Diffusion Equation in Cylindrical and spherical coordinates.

**Chapter 3: 3.1 to 3.7 [omit 3.8 and 3.9]**

**UNIT IV - HYPERBOLIC DIFFERENTIAL EQUATIONS 18hrs**

Formation and solution of one – dimensional wave equation – canonical reduction – IVP – D'Alembert's solution – Vibrating string — IVP and BVP for two – dimensional wave equation – Periodic solution of one- dimensional wave equation in cylindrical and spherical coordinates systems – vibration of circular membrane – Uniqueness of the solution for the wave equation – Duhamel's Principle – Examples.

**Chapter 4: Section 4.1 to 4.12 [omit 4.6 and 4.13]**

**UNIT V - GREEN'S FUNCTION****18hrs**

Green's function for Laplace Equation – methods of Images – Eigen function method – Green's function for the Wave and Diffusion equations. Laplace Transform Method : Solution of Diffusion and Wave equation by Laplace transform.

**Chapter 5: 5.1 to 5.6 Chapters 6: only 6.13, 6.13.1 and 6.13.2 [omit 6.14]**

**DISTRIBUTION OF MARKS: THEORY 70% AND PROBLEMS 30%.**

**TEXT BOOK:**

| S.No | AUTHORS       | TITLE  | PUBLISHERS   | YEAR OF PUBLICATION |
|------|---------------|--|--|---------------------|
| 1    | S. Sankar Rao | Introduction to partial differential equations | 2 <sup>nd</sup> Edition<br>Prentice Hall of India, New Delhi | 2005                |

**REFERENCE BOOKS:**

| S.No. | AUTHORS           | TITLE  | PUBLISHERS                          | YEAR OF PUBLICATION |
|-------|-------------------|--|-------------------------------------|---------------------|
| 1     | R.C. Mc Owen      | partial differential equations   | McGraw Hill<br>New Delhi            | 2005.               |
| 2     | I.N. Snedden      | Elements of Partial Differential Equations                                 | McGraw Hill<br>New Delhi, 1983.     | 1983                |
| 3     | R. Dennemeyer,    | Introduction to Partial Differential Equations and Boundary Value Problems | McGraw Hill,<br>New York, 1968.     | 1968                |
| 4     | M.D. Raisinghania | Advanced Differential Equations,   | S.Chand & Company<br>LTD, New Delhi | 2001                |

**WEB SOURCES:**

1. <http://www.math.toronto.edu/ivrii/PDE-textbook/>
2. <https://www.math.ust.hk/~machas/differential-equation.pdf>

**TEACHING METHODOLOGY:**

1. Class room Teaching
2. Assignments

3. Seminars

4. Discussions

5 .PPT Presentations

### SYLLABUS DESIGNER:

1. B. Vijayalakshmi, Assistant Professor of Mathematics.

### DIFFERENTIAL GEOMETRY

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| II       |              | Core     | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 5      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

### COURSE OBJECTIVES

- This course introduces space curves and their intrinsic properties of a surface and geodesics.
- The non – intrinsic properties of surface and the differential geometry of surfaces are explored.

### COURSE OUTCOMES:

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | To acquire knowledge on the concept of Space Curves  | K2                      |
| CO2       | To understand the intrinsic properties of Surfaces   | K2                      |
| CO3       | To study the concept of Geodesics and its properties   | K3                      |
| CO4       | To understand and discuss the importance of the concepts non intrinsic properties of surface | K4                      |
| CO5       | To analyze the surface theory  | K4                      |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

### MAPPING WITH PROGRAMME OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | M   | S   | M   |
| CO2 | M   | S   | M   | M   | S   | M   |
| CO3 | S   | S   | M   | S   | M   | S   |
| CO4 | M   | M   | S   | S   | M   | S   |
| CO5 | M   | S   | S   | M   | S   | S   |

S- Strong; M- Medium; L- Low



**UNIT – I - SPACE CURVES****18 hrs**

Definition of a space curve – Arc length – Tangent – Normal and Binormal – Curvature and torsion – contact between curves and surfaces – Tangent surface – Involutives and evolutes – Intrinsic equations – Fundamental Existence Theorem for Space curves – Helices.

**Chapter 1: Section 1 to 9.****UNIT –II - INTRINSIC PROPERTIES OF A SURFACE****18 hrs**

Definition of a surface – Curves on surface – Surface of revolution – Helicoids – metric – Direction coefficients – Families of curves – Isometric correspondence – Intrinsic properties.

**Chapter 2: sections 1 to 9.****UNIT –III – GEODESICS****18 hrs**

Geodesics – Canonical geodesic equation – Normal property of geodesics – Existence theorem – geodesics parallels – geodesics Curvature-Gauss-Bonnet Theorem- Gaussian curvature –Surface of constant curvature.

**Chapter 2: sections 10 to 18.****UNIT –IV - NON INTRINSIC PROPERTIES OF A SURFACE****18 hrs**

The second fundamental form – Principal curvature – Lines of curvature – Developable – Developable associated with space curves and with curves on surface – Minimal surfaces –Ruled surfaces.

**Chapter 3: sections 1 to 8.****UNIT – V - DIFFERENTIAL GEOMETRY OF SURFACES****18 hrs**

Fundamental equations of surface theory – Fundamental Existence theorem for surfaces – Compact surfaces whose points are umbilics – Hilbert's lemma – Compact surface for constant curvature – Complete surfaces.

**Chapter 3: sections 9 and 10.****Chapter 4: sections 1 to 5.****DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS: 10%****TEXT BOOKS:**

| S.NO | AUTHORS     | TITLE                                    | PUBLISHERS              | YEAR OF PUBLICATION |
|------|-------------|--|-------------------------|---------------------|
| 1.   | T.J.Wilmore | An Introduction to Differential Geometry | Oxford University Press | 2012                |

**REFERENCE BOOKS:**

| S.NO | AUTHORS         | TITLE                                      | PUBLISHERS                           | YEAR OF PUBLICATION |
|------|-----------------|--|--------------------------------------|---------------------|
| 1.   | J.A. Thorpe     | Elementary Topics in Differential Geometry | Springer                             | 1994                |
| 2.   | D. Somasundaram | Differential Geometry                      | Alpha Science International Limited. | 2005                |

**WEB SOURCES:**

1. [www.pmp-book.org/download/slides/Differential\\_Geometry.pdf](http://www.pmp-book.org/download/slides/Differential_Geometry.pdf)
2. <https://mgarland.org/class/geometry/topics/diffgeom.pdf>

**TEACHING METHODOLOGY**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

**SYLLABUS DESIGNER:**

1. Mrs.G.Chitra, Assistant Professor of Mathematics.

**OPERATIONS RESEARCH**

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| I        |              | Elective | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 3      |
|          |              |          | 5        | 75      | 5        | 75      |           |        |

**COURSE OBJECTIVES:** This course aims to introduce decision theory, PERT, CPM, deterministic and probabilistic inventory systems.

- Introduced Queueing Theory, Replacement and maintenance problems.

**COURSE OUTCOMES:**

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| CO1              | To introduce decision theory, essential elements, certainty and uncertainty with problems. | K2                             |
| CO2              | To apply PERT and CPM techniques for solving real world problems.                          | K3                             |
| CO3              | To analyze inventory systems such as deterministic and probabilistic.                      | K4                             |
| CO4              | To explain queueing theory and its applications.   | K2                             |
| CO5              | To identify, explain and evaluate the replacement and maintenance problems.                | K4                             |

*Knowledge Level: K1 – Remember; K2 –Understand; K3 – Apply; K4 – Analyze*

**MAPPING OF PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| CO1        | S          | S          | M          | M          | S          | M          |
| CO2        | M          | S          | M          | M          | S          | S          |
| CO3        | S          | M          | S          | S          | S          | S          |
| CO4        | S          | M          | M          | S          | M          | S          |
| CO5        | M          | S          | S          | M          | S          | M          |

S- Strong; M-Medium; L-Low

**UNIT -I - DECISION THEORY****15 Hrs**

Steps in Decision theory Approach – Types of Decision-Making Environments – Decision Making Under Uncertainty – Decision Making under Risk – Posterior Probabilities and Bayesian Analysis – Decision Tree Analysis.

**Chapter 11: 11.1 to 11.7****UNIT - II - PROJECT MANAGEMENT: PERT AND CPM****15 Hrs**

Basic Differences between PERT and CPM – Steps in PERT/ CPM Techniques –PERT / CPM Network Components and Precedence Relationships – Critical path Analysis – Probability in PERT Analysis – Project time – cost Trade off – Updating the Project.

**Chapter 13: 13.1 to 13.9****UNIT - III - DETERMINISTIC INVENTORY CONTROL MODELS 15 Hrs**

Meaning of Inventory control – Functional Classification – Advantage of Carrying Inventory – Features of Inventory System – Inventory Model building – Deterministic Inventory Models with no shortage – Deterministic Inventory Models with Shortages.

**Chapter 14: 14.1 to 14.8****UNIT – IV - QUEUEING THEORY****15 Hrs**

Essential Features of Queuing System – Operating Characteristic of Queuing System – Probabilistic Distribution in Queuing Systems Classification of Queuing Models – Solution of Queuing Models - Probability Distribution of Arrivals and Departures.

**Chapter 16: 16.1 to 16.8 and 16.A****UNIT - V - REPLACEMENT AND MAINTENANCE MODELS****15 Hrs**

Failure Mechanism of items – Replacement of Items Deteriorates with Time – Replacement of items that fail completely – other Replacement Problems

**Chapter 17: 17.1 to 17.5****DISTRIBUTION OF MARKS: THEORY 50% AND PROBLEMS 50%****TEXT BOOK:**

| S.No | AUTHORS     | TITLE               | PUBLISHERS       | YEAR OF PUBLICATION |
|------|-------------|---------------------|------------------|---------------------|
| 1    | J.K. Sharma | Operations Research | Mac Millan India | 2001                |

**REFERENCE BOOKS:**

| S.No | AUTHORS                               | TITLE                               | PUBLISHERS                          | YEAR OF PUBLICATION |
|------|---------------------------------------|-------------------------------------|-------------------------------------|---------------------|
| 1    | F.S. Hillier and J.Lieberman          | Introduction to Operation Research  | Tata McGraw Hill Publishing Company | 2006                |
| 2    | Beightler. C, D. Phillips, B. Wilde   | Foundations of Optimization         | Prentice Hall Pvt Ltd               | 1979                |
| 3    | Bazaraa, M.S; J.J.Jarvis, H.D.Sharall | Linear Programming and Network flow | John Wiley and sons                 | 1990                |
| 4    | Gross, D and C.M. Harris              | Fundamentals of Queuing Theory      | Wiley and Sons, New York            | 1998                |

|   |              |                     |  |      |
|---|--------------|---------------------|--|------|
| 5 | Hamdy A.Taha | Operations Research | Prentice-Hall of India Private Limited | 2001 |
|---|--------------|---------------------|--|------|

#### WEB SOURCES:

1. <https://www.goodreads.com/shelf/show/operations-research>
2. <https://www.scribd.com/document/337754670/Operations-Research-Problems-and-Solutions-JK-Sharma>

#### TEACHING METHODOLOGY

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
- 5 .PPT Presentations

#### SYLLABUS DESIGNER:

1. Mrs. R Ramya, Assistant Professor of Mathematics.

#### SKILL ENHANCEMENT IN ALGEBRA AND ANALYSIS

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| II       |              | Optional | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 2      |
|          |              |          | -        | -       | -        | -       |           |        |

#### COURSE OBJECTIVES

- To prepare the students to develop the in- depth knowledge in Algebra and Analysis.
- To Crack lectureship and fellowship exams approved by UGC like CSIR – NET and SET.

#### COURSE OUTCOMES:

| CO Number | CO Statement                              | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To study the concept of Group Theory.     | K2                      |
| CO2       | To acquire the knowledge of permutations. | K3                      |

|     |   |    |
|-----|---|----|
| CO3 | To understand and analyze the concept of Rings and fields.                                      | K4 |
| CO4 | To develop knowledge about set theory and real number system.                                   | K4 |
| CO5 | To develop and apply complex number and analytic function in finding solutions to the problems. | K4 |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.*

#### **MAPPING OF COURSE OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| CO1        | S          | M          | M          | M          | S          | M          |
| CO2        | M          | S          | M          | S          | M          | S          |
| CO3        | S          | M          | S          | M          | M          | S          |
| CO4        | S          | M          | M          | M          | M          | M          |
| CO5        | S          | S          | S          | M          | S          | M          |

S- Strong; M-Medium; L-Low

#### **UNIT I: Groups**

Introduction to Groups – Sub Groups – Coset - Ablian Group - Normal Sub Groups - Cyclic Groups.Quotient Groups - Direct Products - Some important Groups - Homomorphism - Normalizer of Subgroups - Centralizer of an Element or Normalizer of an Element - Commutator Subgroups – Fundamental theorem of Finite Abelian groups – Number of Non isomorphic Ablian Groups - Sylows theorem.

#### **UNIT II: Permutations**

Permutations – Symmetric Group  $S_n$  – Alternating Group  $A_n$  – Conjugacy Classes and Conjugacy Relation.

#### **UNIT III: Rings and Fields**

Rings-Ideals, Prime and maximal ideals,Quotient Rings, Fields,Finite Fields-Field Extensions-Galois Theory

#### **UNIT IV: Set theory and Real Number System**

Elementary Set Theory – Finite Countable and Uncountable Sets – Real number system as a complete ordered field –Archimedean property-Supremum-Infimum-Sequence and series-convergence- limit sup-limit inf-Bolzano Weirstrass theorem- Heine Boral theorem

### UNIT V: Complex Number and Analytic functions

Algebra and complex numbers- The complex plane –polynomials-power series-Transcendental functions such as Exponential, Trigonometry and Hyperbolic and function –Analytic function.

#### TEXT BOOKS:

| S.NO | AUTHORS      | TITLE             | PUBLISHERS                              | YEAR OF PUBLICATION |
|------|--------------|-------------------|---|---------------------|
| 1.   | I.N.Herstein | Topics in Algebra | Wesley Wiley Eastern Limited, New Delhi | 1975, II Edition    |
| 2.   | Walter Rudin | Real Analysis     | Narosa Publishing House, New Delhi      | 1999.               |

#### REFERENCE BOOKS:

| S.NO | AUTHORS                                     | TITLE                  | PUBLISHERS                 | YEAR OF PUBLICATION |
|------|---|------------------------|----------------------------|---------------------|
| 1    | M.Artin                                     | Algebra                | Prentice Hall of India     | 1991                |
| 2    | P.B.Bhattacharya, S.K.Jain, and S.R.Nagpaul | Basic Abstract Algebra | Cambridge University Press | 1997                |

#### SYLLABUS DESIGNER:

1. Mrs. G.Chitra , Assistant Professor of Mathematics.

## M.A (HRM) – Human Resource Management

### Programme Educational Objectives (PEO) :

**PEO 1** :To provide the student with analytical skills to utilize Human Resources metrics and technological applications to enhance the effectiveness of recruitment, training, development and retention of human resources.

**PEO 2** :To Enable the graduates to apply techniques in talent management, recruitment and compensation planning and to develop the student's ability to think critically and analyze opportunities to improve organizational performance through human resources management.

**PEO 3 :**To Strengthen the student's understanding how the alignment of human resources strategy with the organization as a whole and to develop the student's ability to make ethical decisions based on human resource professional standards and practices that are in the best interest of the organization.

**Programme Outcomes (PO) :**

**PO 1 :**To demonstrate proficiency in fundamental human resources, theories and concepts and how they apply to real business situations.

**PO 2:**Students will understand individual behavior in an organization and make effective business decisions.

**PO 3:**To enhance student's to learn about labour laws and various benefits offered to employees.

**PO 4:**To Prepare an understanding of the marketing strategies, international business norms , legal and ethical standards to be followed in a business.

**PO 5:**Students assume counseling skills so that they can work in groups and face various challenging situations.

**PO 6:**Students will have in depth knowledge about industrial relation and various acts provided for the welfare of employees.

**DEPARTMENT OF MANAGEMENT STUDIES**

**M.A - HUMAN RESOURCE MANAGEMENT**

**SEMESTER – I**

| S.No | Part        | Study Components    | Ins.Hrs / Week | Credit | Title of the paper                          | Subject Code | CIA | Uni Exam | Total |
|------|-------------|---------------------|----------------|--------|---|--------------|-----|----------|-------|
|      |             | <b>Course Title</b> |                |        |   |              |     |          |       |
| 1    | Paper - I   | Core paper – I      | 6              | 5      | Principles of management – I                |              | 25  | 75       | 100   |
| 2    | Paper- II   | Core paper – II     | 6              | 5      | Principles of Human Resource Management – I |              | 25  | 75       | 100   |
| 3    | Paper – III | Core paper – III    | 6              | 4      | Labour Legislation                          |              | 25  | 75       | 100   |



|   |            |                      |    |    |  |  |     |     |     |
|---|------------|----------------------|----|----|--|--|-----|-----|-----|
|   |            |                      |    |    | – I  |  |     |     |     |
| 4 | Paper – IV | Core paper – IV      | 6  | 4  | Applied statistics for HR managers                 |  | 25  | 75  | 100 |
| 5 | Paper – I  | Elective paper – I   | 6  | 3  | 1. Marketing management<br>2. Financial management |  | 25  | 75  | 100 |
|   |            | Self study paper - I |    | 2  | Emerging Trends in HRM                             |  |     |     |     |
|   |            |                      | 30 | 21 |  |  | 125 | 375 | 500 |

#### SEMESTER – II

|    |              |                     |    |    |  |  |     |     |     |
|----|--------------|---------------------|----|----|--|--|-----|-----|-----|
| 6  | Paper – V    | Core paper – V      | 6  | 5  | Principles of management – II                |  | 25  | 75  | 100 |
| 7  | Paper- VI    | Core paper – VI     | 6  | 5  | Principles of Human Resource Management – II |  | 25  | 75  | 100 |
| 8  | Paper – VII  | Core paper – VII    | 6  | 4  | Labour Legislation – II                      |  | 25  | 75  | 100 |
| 9  | Paper – VIII | Core paper – VIII   | 5  | 4  | Management Information System                |  | 25  | 75  | 100 |
| 10 | Paper – II   | Elective paper – II | 5  | 3  | Organizational Behavior                      |  | 25  | 75  | 100 |
| 11 | Paper – I    | Compulsory paper    | 2  | 2  | Human Rights                                 |  | 25  | 75  | 100 |
|    |              | Internship training |    | 2  |  |  |     |     |     |
|    |              |                     | 30 | 23 |  |  | 150 | 450 | 600 |

#### SEMESTER – III

| S.NO | PART | STUDY COMPONENTS | INS HRS / WEE | CREDIT | TITLE OF THE PAPER | Subject Code | CIA | UNIV EXAM | TOTAL |
|------|------|------------------|---------------|--------|--------------------|--------------|-----|-----------|-------|
|------|------|------------------|---------------|--------|--------------------|--------------|-----|-----------|-------|

|                      |              |                              |    |          |  |  |     |     |      |
|----------------------|--------------|------------------------------|----|----------|--|--|-----|-----|------|
|                      |              |                              | K  |          |  |  |     |     |      |
| 12                   | Paper – IX   | Core paper – IX              | 6  | 5        | Counselling skills for HR managers       |  | 25  | 75  | 100  |
| 13                   | Paper – X    | Core paper – X               | 6  | 5        | Research methodology                     |  | 25  | 75  | 100  |
| 14                   | Paper – XI   | Core paper – XI              | 6  | 5        | Business communication                   |  | 25  | 75  | 100  |
| 15                   | Paper - XII  | Core paper – XII             | 6  | 5        | International Business Management – I    |  | 25  | 75  | 100  |
| 16                   | Paper - III  | Elective paper – III         | 6  | 3        | Business Policy and Strategic Management |  | 25  | 75  | 100  |
|                      |              | Self study paper- II         |    | 2        | Research Aptitude                        |  |     |     |      |
|                      |              |                              | 30 | 23       |  |  | 125 | 375 | 500  |
| <b>SEMESTER – IV</b> |              |                              |    |          |  |  |     |     |      |
| 17                   | Paper – XIII | Core paper – XIII            | 5  | 5        | Entrepreneurial Management               |  | 25  | 75  | 100  |
| 18                   | Paper – XIV  | Core paper – XIV             | 5  | 5        | International Business Management – II   |  | 25  | 75  | 100  |
| 19                   | Paper - XV   | Core paper – XV              | 5  | 5        | Business Ethics                          |  | 25  | 75  | 100  |
| 20                   | Paper - IV   | Elective paper – IV          | 5  | 3        | Industrial Relations and Labour Welfare  |  | 25  | 75  | 100  |
| 21                   | Paper - I    |                              | 10 | 5        | Project                                  |  | 50  | 50  | 100  |
|                      |              |                              | 30 | 23       |  |  | 150 | 350 | 500  |
|                      |              |                              |    | 90       |  |  |     |     | 2100 |
|                      |              | <b>Optional Internship :</b> |    | <b>3</b> |  |  |     |     |      |

#### CONSOLIDATED STATEMENT

| PART   | SUBJECT          | PAPERS | CREDIT          | TOTAL CREDIT | MARKS | TOTAL MARKS |
|--|------------------|--------|-----------------|--------------|-------|-------------|
| Part - III   | Core Theory      | 15     | 11 (5)<br>4 (4) | 55<br>16     | 100   | 1500        |
| Part - III   | Elective         | 4      | 3               | 12           | 100   | 400         |
|  | Compulsory Paper | 1      | 2               | 2            | 100   | 100         |
|  | Project          |        | 5               | 5            | 100   | 100         |
|  | Total            |        |                 | 90           |       | 2100        |
| Internship Training Program during summer vocation with an extra credit = 1 TO 3 |                  |        |                 |              |       |             |

## APPLIED STATISTICS FOR HR MANAGERS

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
| I        |              | Core     | Hrs/week | Hrs/Sem | Hrs/week | Hrs/Sem | 0         | 4      |
|          |              |          | 6        | 90      | 6        | 90      |           |        |

### COURSE OBJECTIVES:

- This enables the students to understand and use the applications of statistics in the real-time problems
- To apply statistical techniques in real life situations
- This course seeks the comprehensive knowledge about the data collection, presentation of data, pictorial representation, and measures of central tendency, measures of dispersion, control charts, correlation, regression, time series, probability, estimation and inference

### COURSE OUTCOMES:

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | Organize, present and interpret statistical data, both numerically and graphically.   | K1                      |
| CO2       | Analyze statistical data using measures of central tendency, dispersion and location.   | K4                      |
| CO3       | Employ the principles of linear regression and correlation, including least square method, predicting a particular value of Y for a given value of X and significance of the correlation coefficient. | K3                      |
| CO4       | Explain and successfully apply all aspects of parametric testing techniques including single and multi-sample tests for mean and proportions  | K2                      |
| CO5       | Understand the concept of Testing of Hypothesis and also apply the same to test a hypothesis by using Factor analysis – Cluster analysis  | K4                      |

*Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze*

### MAPPING OF PROGRAMME OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | M   | S   | M   |
| CO2 | M   | S   | M   | M   | S   | S   |
| CO3 | S   | M   | S   | S   | S   | S   |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO4</b> | S | M | M | S | M | S |
| <b>CO5</b> | M | S | S | M | S | M |

S- Strong; M-Medium; L-Low

### **UNIT- I STATISTICAL INTRODUCTION**

**18 Hrs**

Nature and scope of Statistical methods and their limitation – Classification, tabulation and diagrammatical representation of various types of statistical data.

### **UNIT- II MEASURES OF CENTRAL TENDENCY AND DISPERSION IN**

#### **FREQUENCY DISTRIBUTION (problems only)**

**18 Hrs**

Measures of central tendency and dispersion in frequency distribution: AM, GM, HM, Standard deviation, co-efficient of variation, exploratory data analysis.

### **UNIT- III CORRELATION AND REGRESSION**

**18 Hrs**

Regression lines – Rank correlation co-efficient – standard distribution – Binomial- Poisson and Normal distribution – Simple Problems.

### **UNIT- IV TEST OF SIGNIFICANCE**

**18 Hrs**

Concepts of sampling distribution – Standard error – Tests of significance based on t, chi-square and F-distribution with respect to mean, variance and correlation co-efficient – Theory of attributes and testes of independence in contingency table –Simple problems.

### **UNIT- V ANALYSIS OF VARIANCE**

**18 Hrs**

Analysis of variance – One way and Tow way classification – Factor analysis – Cluster analysis – Perception mapping (Theory only)

**DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%**

#### **TEXT BOOK**

| <b>S.No</b> | <b>AUTHORS</b> | <b>TITLE</b>        | <b>PUBLISHERS</b> | <b>YEAR OF PUBLICATION</b> |
|-------------|----------------|---------------------|-------------------|----------------------------|
| 1           | S.P.Gupta      | Statistical methods | Sultan & Chand    | 2000                       |

#### **REFERENCE BOOK**

| <b>S.No</b> | <b>AUTHORS</b>                  | <b>TITLE</b>                    | <b>PUBLISHERS</b>                  | <b>YEAR OF PUBLICATION</b> |
|-------------|---------------------------------|---------------------------------|------------------------------------|----------------------------|
| 1           | E.B Mode                        | Elements of statistics          | Prentices Hall                     | 1961                       |
| 2           | S.S Wilks                       | Elementary Statistical Analysis | Oxford and IBH                     |                            |
| 3           | Richard I. Levin, David S.Rubin | Statistics for Management       | Prentices Hall of India, New Delhi |                            |

**WEB SOURCES:**

[https://books.google.co.in/books/about/Business\\_Mathematics\\_Statistics.html?id=h8MRWarmdOwC](https://books.google.co.in/books/about/Business_Mathematics_Statistics.html?id=h8MRWarmdOwC)

<https://www.goodreads.com/book/show/30652420-business-mathematics-and-statistics>

**TEACHING METHODOLOGY**

1. Class room Teaching
2. Assignments
3. Seminars
4. Discussions
5. PPT Presentations

**SYLLABUS DESIGNER**

1. Ms. K.Geetha priya, Assistant Professor of Mathematics.

**DEPARTMENT OF CHEMISTRY- UG****The course of study and Scheme of Examination****SEMESTER I**

| S.No. | Part | Study components  |         | Ins.<br>Hrs/<br>Week | Credit | Title of the<br>paper             | Maximum marks |      |       |
|-------|------|-------------------|---------|----------------------|--------|-----------------------------------|---------------|------|-------|
|       |      | Course Title      |         |                      |        |                                   | CIA           | Uni. | Total |
| 1     | I    | Language          | Paper I | 6                    | 4      | Tamil-I                           | 25            | 75   | 100   |
| 2     | II   | English           | Paper I | 6                    | 4      | English-I                         | 25            | 75   | 100   |
| 3     | III  | Core              | Paper I | 6                    | 5      | Fundamental concepts of Chemistry | 25            | 75   | 100   |
| 4     | III  | Practical         | Prac.I  | 3                    | 0      | Titrimetry                        | -             | -    | -     |
| 5     | III  | Allied theory     | Paper I | 4                    | 4      | Physics-I                         | 25            | 75   | 100   |
| 6     | III  | Allied Practicals | Prac. I | 3                    | 0      | Physics Practicals                | -             | -    | -     |
| 7     | IV   | EVS               |         | 2                    | 2      | Environmental studies             | 25            | 75   | 100   |
|       |      |                   |         | 30                   | 19     |                                   | 125           | 375  | 500   |

### SEMESTER II

| S.No. | Part | Study components  |          | Ins. Hrs/ Week | Credit | Title of the paper  | Maximum marks |      |       |
|-------|------|-------------------|----------|----------------|--------|---------------------|---------------|------|-------|
|       |      | Course Title      |          |                |        |                     | CIA           | Uni. | Total |
| 1     | I    | Language          | Paper II | 6              | 4      | Tamil-II            | 25            | 75   | 100   |
| 2     | II   | English           | Paper II | 4              | 4      | English-II          | 25            | 75   | 100   |
| 3     | III  | Core              | Paper II | 5              | 5      | General Chemistry-I | 25            | 75   | 100   |
| 4     | III  | Practical         | Prac.I   | 3              | 3      | Titrimetry          | 40            | 60   | 100   |
| 5     | III  | Allied theory     | Paper II | 4              | 4      | Physics-II          | 25            | 75   | 100   |
| 6     | III  | Allied Practicals | Prac.I   | 3              | 2      | Physics Practicals  | 40            | 60   | 100   |
| 7     | IV   | Value education   |          | 3              | 2      | Value education     | -             | 50   | 50    |
| 8     | IV   | Soft skill        |          | 2              | 1      | Soft skill          | -             | 50   | 50    |
|       |      |                   |          | 30             | 25     |                     | 180           | 520  | 700   |

### SEMESTER III

| S.No. | Part | Study components  |           | Ins. Hrs/ Week | Credit | Title of the paper                 | Maximum marks |      |       |
|-------|------|-------------------|-----------|----------------|--------|------------------------------------|---------------|------|-------|
|       |      | Course Title      |           |                |        |                                    | CIA           | Uni. | Total |
| 9     | I    | Language          | Paper III | 6              | 4      | Tamil-III                          | 25            | 75   | 100   |
| 10    | II   | English           | Paper III | 6              | 4      | English-III                        | 25            | 75   | 100   |
| 11    | III  | Core              | Paper III | 4              | 4      | General Chemistry-II               | 25            | 75   | 100   |
| 12    | III  | Practical         | Prac.II   | 3              | 0      | Semimicro Qualitative Analysis     | -             | -    | -     |
| 13    | III  | Allied theory     | Paper III | 4              | 4/5    | Zoology/Mathematics-I              | 25            | 75   | 100   |
| 14    | III  | Allied Practicals | Prac.II   | 3              | 0      | Zoology Practicals                 | -             | -    | -     |
| 15    | IV   | Skill based       | Paper I   | 2              | 2      | Role of Chemistry in Everyday Life | -             | 50   | 50    |
| 16    | IV   | Non-major         | Paper I   | 2              | 2      | Medicinal Chemistry                | -             | 50   | 50    |
|       |      |                   |           | 30             | 20/21  |                                    | 100           | 400  | 500   |

### SEMESTER IV

| S.No. | Part | Study components |       | Ins. Hrs/ Week | Credit | Title of the paper | Maximum marks |      |       |
|-------|------|------------------|-------|----------------|--------|--------------------|---------------|------|-------|
|       |      | Course Title     |       |                |        |                    | CIA           | Uni. | Total |
| 17    | I    | Language         | Paper | 6              | 4      | Tamil-IV           | 25            | 75   | 100   |

|    |     |                   |          |           |              |                                |            |            |            |
|----|-----|-------------------|----------|-----------|--------------|--------------------------------|------------|------------|------------|
|    |     |                   | IV       |           |              |                                |            |            |            |
| 18 | II  | English           | Paper IV | 6         | 4            | English-IV                     | 25         | 75         | 100        |
| 19 | III | Core              | Paper IV | 4         | 4            | General Chemistry-III          | 25         | 75         | 100        |
| 20 | III | Practical         | Prac. II | 3         | 3            | Semimicro Qualitative Analysis | 40         | 60         | 100        |
| 21 | III | Allied theory     | Paper IV | 4         | 4/5          | Zoology/Mathematics-II         | 25         | 75         | 100        |
| 22 | III | Allied Practicals | Prac. II | 3         | 2/0          | Zoology Practicals             | 40         | 60         | 100        |
| 23 | IV  | Skill based       | Paper II | 2         | 2            | Water Analysis and Treatment   |            | 50         | 50         |
| 24 | IV  | Non-major         | Paper II | 2         | 2            | Chemistry in Everyday Life     |            | 50         | 50         |
|    |     |                   |          | <b>30</b> | <b>25/24</b> |                                | <b>180</b> | <b>520</b> | <b>700</b> |

**\* Summer internship programme at the end of IV semester (Optional) – Extra credit-1**

#### SEMESTER V

| S.No. | Part | Study components |           | Ins.<br>Hrs/<br>Week | Credit | Title of the paper   | Maximum marks |      |       |
|-------|------|------------------|-----------|----------------------|--------|--|---------------|------|-------|
|       |      | Course Title     |           |                      |        |  | CIA           | Uni. | Total |
| 25    | III  | Core             | Paper V   | 4                    | 4      | Inorganic Chemistry-I  | 25            | 75   | 100   |
| 26    | III  | Core             | Paper VI  | 5                    | 5      | Organic Chemistry-I  | 25            | 75   | 100   |
| 27    | III  | Core             | Paper VII | 4                    | 4      | Physical Chemistry   | 25            | 75   | 100   |
| 28    | III  | Elective         | Paper I   | 3                    | 3      | *Any one paper from the following:<br>1.Analytical chemistry<br>2. Green Chemistry       | 25            | 75   | 100   |
| 29    | III  | Elective         | Paper II  | 3                    | 3      | *Any one paper from the following:<br>1. Pharmaceutical Chemistry<br>2.Textile Chemistry | 25            | 75   | 100   |
| 30    | III  | Core Practical   | Paper III | 3                    | 0      | Gravimetric Analysis   | -             | -    | -     |
| 31    | III  | Core Practical   | Paper IV  | 3                    | 0      | Organic Analysis   | -             | -    | -     |
| 32    | III  | Core Practical   | Paper V   | 3                    | 0      | Physical Chemistry   | -             | -    | -     |

|    |    |             |           |           |           |                   |            |            |            |
|----|----|-------------|-----------|-----------|-----------|-------------------|------------|------------|------------|
|    |    |             |           |           |           | Practicals        |            |            |            |
| 33 | IV | Skill Based | Paper III | 2         | 2         | Polymer chemistry | -          | 50         | 50         |
|    |    |             |           | <b>30</b> | <b>21</b> |                   | <b>125</b> | <b>425</b> | <b>550</b> |

#### SEMESTER VI

| S.No. | Part | Study components   |            | Ins.<br>Hrs/<br>Week | Credit | Title of the paper  | Maximum marks |      |       |
|-------|------|--------------------|------------|----------------------|--------|---|---------------|------|-------|
|       |      | Course Title       |            |                      |        |   | CIA           | Uni. | Total |
| 34    | III  | Core               | Paper VIII | 6                    | 5      | Inorganic Chemistry-II  | 25            | 75   | 100   |
| 35    | III  | Core               | Paper IX   | 7                    | 5      | Organic Chemistry-II  | 25            | 75   | 100   |
| 36    | III  | Elective           | Paper III  | 3                    | 3      | *Any one paper from the following:<br>1. Electrochemistry<br>2. Nanochemistry | 25            | 75   | 100   |
| 37    | III  | Elective           | Paper IV   | 3                    | 3      | *Any one paper from the following:<br>1. Spectroscopy<br>2. Food Chemistry    | 25            | 75   | 100   |
| 38    | III  | Core Practical     | Paper III  | 3                    | 3      | Gravimetric Analysis  | 25            | 75   | 100   |
| 39    | III  | Core Practical     | Paper IV   | 3                    | 3      | Organic Analysis  | 25            | 75   | 100   |
| 40    | III  | Core Practical     | Paper V    | 3                    | 3      | Physical Chemistry Practicals   | 25            | 75   | 100   |
| 41    | IV   | Skill Based        | Paper IV   | 2                    | 2      | Industry Chemistry  | -             | 50   | 50    |
| 42    |      | Extension activity |            |                      | 3      |   |               |      | 100   |
|       |      |                    |            | 30                   | 30     |   | 175           | 575  | 850   |

**\* Mini project in the VI-Semester (optional) – Extra Credit 1**



**DEPARTMENT OF CHEMISTRY (UG)**

| Part         | Subject               | Papers | Credit           | Total credits | Marks | Total Marks |
|--------------|-----------------------|--------|------------------|---------------|-------|-------------|
| I            | Language              | 4      | 4                | 16            | 100   | 400         |
| II           | English               | 4      | 4                | 16            | 100   | 400         |
| III          | Allied Theory(Phy)    | 2      | 4                | 10            | 100   | 200         |
|              | Practicals            | 1      | 2                |               | 100   | 100         |
|              | *Allied theory(Maths) | 2      | 5                |               | 100   | 200         |
|              | Allied Zoo theory     | 2      | 4                |               | 100   | 200         |
|              | Practicals            | 1      | 2                |               | 100   | 100         |
| III          | Elective              | 4      | 3                | 12            | 100   | 400         |
| III          | Core theory           | 9      | 5x5=25<br>4x4=16 | 41            | 100   | 900         |
|              | Core Practicals       | 5      | 3                | 15            | 100   | 500         |
| IV           | EVS                   | 1      | 2                | 2             | 100   | 100         |
| IV           | VE                    | 1      | 2                | 2             | 50    | 50          |
| IV           | Skill based           | 4      | 2                | 8             | 50    | 200         |
| IV           | Non-major             | 2      | 2                | 4             | 50    | 100         |
| IV           | Soft skill            | 1      | 1                | 1             | 50    | 50          |
|              | Extension activity    |        | 3                | 3             | 100   | 100         |
| <b>Total</b> |                       |        |                  | <b>140</b>    |       | <b>3800</b> |

**\*If Mathematics is one of the allied subjects total number of papers will be 41**

**PROGRAMME EDUCATIONAL OBJECTIVES:**

**PEO1:** To create an attitude for pursuing future studies and in the field of research.

**PEO2:** Achieve excellence in the subject and to pursue their career.

**PROGRAMME OUTCOMES:**

**PO1.** To know the basic concepts of Chemistry and to create interest in the study of the subject.

**PO2.** To understand the role of chemistry in daily life and in the society.

**PO3.** To create thirst in critical thinking, analyzing and problem solving skills.

- P04.** To create a knowledge in promising areas of chemical sciences and to motivate the students to pursue their future studies.
- P05.** To develop the activity in understanding and applying the principles of chemistry.
- P06.** To equip with the skills to compete for competitive examinations and to find employment in various sectors.

#### **FUNDAMENTAL CONCEPTS OF CHEMISTRY**

| Semester | Subject Code | Category | Lecture hours |          | Theory hours |          | Practical hours |          | Credits |
|----------|--------------|----------|---------------|----------|--------------|----------|-----------------|----------|---------|
|          |              |          | Per week      | Per sem. | Per week     | Per sem. | Per week        | Per sem. |         |
| I        |              | Core-I   | 6             | 90       | 6            | 90       | -               | -        | 5       |

#### **COURSE OBJECTIVES**

- Students gain knowledge about basic principles of organic, inorganic, thermodynamics and quantum chemistry.

#### **COURSE OUTCOMES:**

On the successful completion of the course, students will be able to

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To get an idea towards the functional groups and naming of organic compounds                      | K3                      |
| <b>CO2</b> | To understand the concepts of various electronic effects and its influences in organic molecules. | K3                      |
| <b>CO3</b> | To study the concept of atomic orbitals and periodic properties                                   | K3                      |
| <b>CO4</b> | To know the theory behind the volumetric analysis and can get an idea of theories of indicators   | K2                      |
| <b>CO5</b> | To understand the elementary idea of thermodynamics and quantum chemistry.                        | K2                      |

\*CO – course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

**MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | S          | S          |
| <b>CO2</b> | S          | M          | S          | M          | S          | S          |
| <b>CO3</b> | S          | M          | M          | M          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | M          | M          | S          | S          | S          |

**(S-Strong; M-Medium; L-Low)****Unit-I: Classification and Nomenclature****18 Hrs**

- 1.1 Classification of organic compounds - based on the nature of carbon skeleton and functional groups - classification of Carbon and Hydrogen atoms of organic compounds (primary/secondary/tertiary) - IUPAC system of nomenclature of common organic compounds (upto C-10) - alkanes, alkenes, alkynes, cycloalkanes, and aromatic compounds - Naming of organic compounds with one functional group - halogen compounds, alcohols, phenol, aldehydes, ketones, carboxylic acids and its derivatives, cyano compounds, amines, nitro compounds (Both aliphatic and aromatic).
- 1.2 Naming of compounds with two functional groups – naming of compounds with more than one carbon chain – Naming of heterocyclic compounds containing one and two hetero atoms present in five/six membered rings. Hybridization and geometry – methane, ethane, ethylene and acetylene – bond angle, bond length, bond strength of C-H and C-C bonds.

**Unit-II: Bonding in Organic Molecules****18 Hrs**

- 2.1 Inter and Intramolecular forces and their effects on physical properties – Electronic effects – inductive effect – resonance effect – drawing of resonance structures - conditions for resonance – stability of resonance structures – hyperconjugation - electromeric effect - steric effect - steric acceleration and steric hindrance (with examples).
- 2.2 Dissociation of bonds – homolysis and heterolysis – free radicals – carbocations – carbanions - electrophiles and nucleophiles – Influence of electronic effects – dipole moment – relative strengths of acids and bases – stability of olefins – stability of free radicals, carbocations and carbanions.

**UNIT-III: Periodic properties****18 Hrs**

- 3.1 Atomic orbitals – quantum numbers – principal, azimuthal, magnetic and spin quantum numbers and their significance – principles governing the occupancy of electrons in various quantum levels – Pauli's exclusion principle – Hund's rule of maximum multiplicity -- Aufbau Principle, (n+1) rule – electronic configuration of elements – Stability of half-filled and completely filled orbitals— inert pair effect.

- 3.2 Periodic properties – classification of elements as s, p, d and f-block elements – variation of atomic volume – atomic and ionic radii – ionization potential – electron affinity and electronegativity along period and groups – variation of metallic character – Factors affecting the periodic properties – Periodic table anomalies and variations in atomic radius, ionic radius, electronic configuration, electron affinity and electronegativity – ionization energy and metallic character of elements along the group and periods.

#### **Unit-IV: Principles of Volumetric Analysis**

**18 Hrs**

- 4.1 General principle: Types of titration – Requirements for titrimetric analysis. Concentration terms: Molarity, molality formality, normality, weight %, ppm, milliequivalence and millimoles – problems – Primary and secondary standards – criteria for primary standards – preparation of standard solutions, standardization of solutions – Limitations of volumetric analysis, endpoint and equivalence point – neutralization – titration curve.
- 4.2 Theory of indicators, choice of indicators – Use of phenolphthalein and methyl orange – complexometric titrations: Stability of complexes, titration involving EDTA – Metal ion indicators and characteristics – Problems based on titrimetric analysis.

#### **Unit – V: Atomic Structure**

**18 Hrs**

- 5.1 Definition and explanation of terms – system, boundary and surroundings – homogeneous and heterogeneous system – isolated system – closed system – open system – intensive and extensive properties – state of a system – Independent state variables – dependent state variables – Thermodynamic functions – state and path functions – Thermodynamic processes – cyclic – reversible – irreversible – isothermal – adiabatic process – Concept of heat and work – Zeroth law of thermodynamics – First law of thermodynamics – statement and equation –  $C_p$ ,  $C_v$  relationship – calculation of  $W$ ,  $Q$ ,  $\Delta E$  and  $\Delta H$  for the expansion of ideal gases under reversible isothermal and adiabatic conditions.
- 5.2 Quantum chemistry: Quantum theory of radiation – Planck's theory – photoelectric effect – Compton effect – Wave mechanical concept of the atom – de Broglie's relationship – Davison and Germer experiment – wave nature of electron – Heisenberg's uncertainty principle – Schrodinger wave equation (No derivation) – significance of wave functions  $\psi$  and  $\psi^2$ .

#### **TEXT BOOKS**

| <b>S. No.</b> | <b>Authors</b>                         | <b>Title</b>                     | <b>Publishers</b> | <b>Year of publication</b> |
|---------------|--|----------------------------------|-------------------|----------------------------|
| 1.            | P. L. Soni                             | Text Book of Organic Chemistry   | Sultan Chand      | 1986                       |
| 2.            | K. S. Tewari, N. K. Vishnoi, and S. N. | A text book of Organic Chemistry | Vikas Publishing  | 2011                       |

|    |   |                                  |                                |      |
|----|---|----------------------------------|--------------------------------|------|
|    | Mehrotra                                      |                                  | House, 3 <sup>rd</sup> edition |      |
| 3. | B. R. Puri, Sharma and Madan and S. Pathanaia | Principles of Physical chemistry | Vishnoi Publicating Co.,       | 2013 |

#### REFERENCE BOOKS

| S. No. | Authors                                   | Title                                  | Publishers                     | Year of publication |
|--------|---|--|--------------------------------|---------------------|
| 1.     | B. R. Puri, L. R. Sharma and K. C. Kallia | Principles of Inorganic chemistry      | Milestone Publications         | 2013                |
| 2.     | W. U. Malik, G. D. Tuli and R. D. Madan   | Selected topics in Inorganic chemistry | S. Chand Publications          | 2008                |
|        |   |  |                                |                     |
| 4.     | Bahl and Arun Bahl                        | Advanced Organic Chemistry             | S. Chand and company Ltd       | 2010                |
| 5.     | M. K. Jain and S. C. Sharma               | Modern Organic chemistry               | Vishnoi Publications           | 2017                |
| 6.     | R. T. Morrison and R. N. Boyd             | Organic Chemistry                      | Prentice- Hall of India        | 2008                |
| 7.     | P. L. Soni                                | Text Book of Physical Chemistry        | Sultan Chand and Sons          | 1992                |
| 8.     | R. D. Madan                               | Modern Inorganic Chemistry             | S. Chand Publications, Reprint | 2014                |

#### TEACHING METHODOLOGY:

- Power Point Presentations
- Assignments
- Animated videos
- Chalk and Board
- 

#### SYLLABUS DESIGNER:

- Dr.P.N. Sudha, Principal and Assoicate Professor of Chemistry
- Dr.M. Nagarathinam, Head & Associate Professor of Chemistry
- Dr.S.Santha Lakshmi, Assistant Professor of Chemistry
- Dr. N. Dhanam, Assistant Professor of Chemistry
- Dr.S.Sashikala, Assistant Professor of Chemistry
- Dr. K. Vijayalakshmi, Assistant Professor, Department of Chemistry
- Dr. T. Gomathi, Assistant Professor, Department of Chemistry

- Mrs. J. Saranya, Assistant Professor, Department of Chemistry
- Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

### GENERAL CHEMISTRY – I

| Semester | Subject Code | Category | Lecture hours |          | Theory hours |          | Practical hours |          | Credits |
|----------|--------------|----------|---------------|----------|--------------|----------|-----------------|----------|---------|
|          |              |          | Per week      | Per sem. | Per week     | Per sem. | Per week        | Per sem. |         |
| II       |              | Core-II  | 5             | 75       | 5            | 75       | -               | -        | 5       |

#### COURSE OBJECTIVES:

- To gain knowledge on preparation, properties and reactions various hydrocarbons.
- To learn the theory behind the volumetric analysis.

#### COURSE OUTCOMES:

On the successful completion of the course, students will be able to

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To learn about the chemistry of alkanes and alkenes   | K2                      |
| CO2       | To learn about the chemistry of alkynes and cycloalkanes  | K2                      |
| CO3       | To understand various types of chemical bonding   | K3                      |
| CO4       | To gain knowledge about s-block elements, compounds and its complexes   | K3                      |
| CO5       | To learn about thermochemistry and the behavior of ideal gases and can solve the problems regarding molecular velocities. | K3                      |

\*CO – course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

#### MAPPING WITH PROGRAMME OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | M   | M   | S   |
| CO2 | S   | M   | M   | M   | M   | S   |
| CO3 | S   | M   | M   | S   | S   | S   |
| CO4 | S   | M   | M   | M   | M   | S   |
| CO5 | S   | M   | M   | S   | S   | S   |

**(S-Strong; M-Medium; L-Low)**

**UNIT – I: Alkanes and alkenes**

**15 Hrs**

- 1.1 Alkanes – Methods of preparation of alkanes – Wurtz method, Sabatier –Senderens reduction, Kolbe's electrolytic method and reduction of alkyl halides – physical properties and chemical properties of alkanes – isomerisation, aromatization, oxidation with  $\text{KMnO}_4$  – cracking – chlorination – mechanism of free radical substitution reaction.
- 1.2 Alkenes: Preparation from alcohol, haloalkane, dihaloalkanes and alkynes – reactions of alkenes – mechanisms involved in addition of hydrogen, halogen, hydrogen halide, hypohalous acid, water, hydroboration, hydroxylation, ozonolysis, isomerisation and epoxidation – Markonnikoff's rule – peroxide effect – allylic substitution by NBS, oxidation by  $\text{KMnO}_4$  and polymerization – Dienes – classification-conjugated, isolated and cumulated dienes – stability of dienes – synthesis of dienes-1,3 butadiene, isoprene and chloroprene – reactions – 1,2 and 1,4 – addition reactions of  $\text{H}_2$  and  $\text{HX}$ , polymerization and Diels-Alder reaction.

**UNIT-II: Alkynes and Cycloalkanes**

**15 Hrs**

- 2.1 Alkynes: preparation – reactions – addition of hydrogen, halogen, hydrogen halide, water,  $\text{HCN}$ ,  $\text{CH}_3\text{COOH}$ , hydroboration, alcohols and carboxylic acids, polymerization, ozonolysis, oxidation with chromic acid and alkaline  $\text{KMnO}_4$  – acidity of terminal alkynes – formation of acetylides.
- 2.2 Cycloalkanes: Preparation – Wurtz reaction, Dieckmann's condensation and reduction of aromatic hydrocarbons – reactions – cycloaddition, dehalogenation, pyrolysis of calcium salt of dicarboxylic acid – substitution and ring opening reactions – stability of alkanes, alkenes and cycloalkanes – Baeyer's strain theory – theory of strainless rings.

**UNIT - III: Chemical bonding**

**15 Hrs**

- 3.1 Ionic bond – Properties of ionic compounds – factors favoring the ionic compounds – ionization potential – electron affinity – electronegativity – Lattice energy – Born-Haber Cycle – Pauling and Mulliken's scales of electronegativity – Polarizing power and Polarizability – Partial ionic character from electronegativity – Transition from ionic to covalent character and vice versa – Covalent character of ionic compounds – Fajan's rules – Covalent bond.
- 3.2 Hydrogen bonding – Its nature, types, effect on properties – Intermolecular forces – London forces and Van der Waals forces – ion dipole-dipole interactions – VSEPR Theory – Principles and hybridization- Shapes of simple inorganic molecules ( $\text{BeCl}_2$ ,  $\text{BF}_3$ ,  $\text{SiCl}_4$ ,  $\text{PCl}_5$ ,  $\text{SF}_6$ ,  $\text{H}_2\text{O}$ ,  $\text{NH}_3$ ) – MO Theory – Bonding and

anti-bonding orbitals – Applications of MO theory  $H_2$ , He,  $N_2$ ,  $O_2$ , HF and CO molecules – bond order.

#### **UNIT – IV: s - Block Elements**

**15 Hrs**

- 4.1 Position of hydrogen in the periodic table – General characteristics of s – block elements – Compounds of s-block metals – oxides, hydroxides, peroxides, superoxide - preparation and properties – oxo salts – carbonates – bicarbonates – nitrates – halides - Anomalous behavior of Lithium and beryllium.
- 4.2 Extraction of beryllium – physical and chemical properties of beryllium – Uses – Extraction of Magnesium – physical and chemical properties – Uses. Complexes of s-block metals – complexes with crown ethers – Organometallic compounds of Lithium and Be.

#### **Unit – V: Thermochemistry and Gaseous State**

**15 Hrs**

- 5.1 Thermochemistry: Heat of reaction – exothermic and endothermic reactions – calculation of  $\Delta H$  from  $\Delta E$  and vice versa – Thermochemical equations – bond dissociation energy – calculation from thermochemical data – variation of heat of a reaction with temperature – Kirchoff's equation and its significance.
- 5.2 Gaseous state – Kinetic gas equation – derivation – Gas laws from the kinetic gas equation – kinds of velocities – mean, rms, most probable velocities – Calculation of molecular velocities – Maxwell's distribution of molecular velocities (no derivation) – equipartition of energy – Real gases – Virial equation of state – Boyle temperature ( No derivation) – Joule's law – Joule-Thomson effect – Joule-Thomson coefficient and its derivation – inversion temperature and its significance (No derivation).

#### **TEXT BOOKS**

| <b>S. No.</b> | <b>Authors</b>                                  | <b>Title</b>                     | <b>Publishers</b>                               | <b>Year of publication</b> |
|---------------|---|----------------------------------|---|----------------------------|
| 1.            | P. L. Soni                                      | Text Book of Organic Chemistry   | Sultan Chand                                    | 1986                       |
| 2.            | K. S. Tewari, N. K. Vishnoi, and S. N. Mehrotra | A text book of Organic Chemistry | Vikas Publishing House, 3 <sup>rd</sup> edition | 2011                       |
| 3.            | B. R. Puri, Sharma and Madan and S. Pathanaia   | Principles of Physical chemistry | Vishnoi Publicating Co.,                        | 2013                       |



**REFERENCE BOOKS**

| S. No. | Authors                                   | Title                                  | Publishers                     | Year of publication |
|--------|---|--|--------------------------------|---------------------|
| 1.     | B. R. Puri, L. R. Sharma and K. C. Kallia | Principles of Inorganic chemistry      | Milestone Publications         | 2013                |
| 2.     | W. U. Malik, G. D. Tuli and R. D. Madan   | Selected topics in Inorganic chemistry | S. Chand Publications          | 2008                |
|        |   |  |                                |                     |
| 4.     | Bahl and Arun Bahl                        | Advanced Organic Chemistry             | S. Chand and company Ltd       | 2010                |
| 5.     | M. K. Jain and S. C. Sharma               | Modern Organic chemistry               | Vishnoi Publications           | 2017                |
| 6.     | R. T. Morrison and R. N. Boyd             | Organic Chemistry                      | Prentice- Hall of India        | 2008                |
| 7.     | P. L. Soni                                | Text Book of Physical Chemistry        | Sultan Chand and Sons          | 1992                |
| 8.     | R. D. Madan                               | Modern Inorganic Chemistry             | S. Chand Publications, Reprint | 2014                |

**TEACHING METHODOLOGY:**

- Power Point Presentations
- Assignments
- Animated videos
- Chalk and Board

**SYLLABUS DESIGNER:**

- Dr.P.N. Sudha, Principal and Associate Professor of Chemistry
- Dr.M. Nagarathinam, Head & Associate Professor of Chemistry
- Dr.S.Santha Lakshmi, Assistant Professor of Chemistry
- Dr. N. Dhanam, Assistant Professor of Chemistry
- Dr.S.Sashikala, Assistant Professor of Chemistry
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- Mrs. J. Saranya, Assistant Professor, Department of Chemistry
- Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

## I YEAR - MAIN PRACTICAL - I TITRIMETRY

| Semester | Subject Code | Category    | Lecture hours |          | Theory hours |          | Practical hours |          | Credits |
|----------|--------------|-------------|---------------|----------|--------------|----------|-----------------|----------|---------|
|          |              |             | Per week      | Per sem. | Per week     | Per sem. | Per week        | Per sem. |         |
| II       |              | Practical-I | -             | -        | -            | -        | 3               | 45       | 3       |

### Acidimetry

1. Estimation of borax using standard sodium carbonate
2. Estimation of sodium carbonate using standard sodium carbonate
3. Estimation of oxalic acid using standard oxalic acid

### Iodimetry

4. Estimation of arsenious oxide using standard arsenious oxide (Demonstration only)

### Iodometry

5. Estimation of Copper using standard copper sulphate.
6. Estimation of Potassium dichromate using standard Potassium dichromate.

### Complexometry

7. Estimation of Magnesium using standard Magnesium sulphate solution.
8. Estimation Zinc using standard Zinc sulphate solution.

### Permanganometry

9. Estimation of Ferrous ammonium sulphate using standard Ferrous ammonium sulphate
10. Estimation of Oxalic acid using standard Oxalic acid

Students must write short procedure for the given estimation in ten minutes during the examinations and submit the paper for evaluation.

### TEACHING METHODOLOGY:

- Chalk and Board
- Demonstration
- Conducting Experiments
- Conducting Viva

### SYLLABUS DESIGNER:

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### **SCHEME OF VALUATION FOR PRACTICAL EXAMINATIONS**

#### **PRACTICAL – I**

##### **Volumetric analysis**

Internal assessment: 40 Marks

External assessment: 60 marks

Total: 100 marks

Record: 10 Marks

Procedure: 10 Marks

Viva: 5 Marks

|            |           |      |
|------------|-----------|------|
| Error upto | 2 %       | :35  |
|            | 2.1 – 3 % | :30  |
|            | 3.1 – 4 % | :25  |
|            | 4.1 – 5 % | :20  |
|            | > 5 %     | : 15 |

For incomplete or wrong calculation deduct 20 % of total marks scored.

For no calculation deduct 40 % of total marks scored.

For each arithmetic error deduct 1 mark.

#### **ALLIED CHEMISTRY PAPER – I**

| Semester | Subject Code | Category | Lecture hours |          | Theory hours |          | Practical hours |          | Credits |
|----------|--------------|----------|---------------|----------|--------------|----------|-----------------|----------|---------|
|          |              |          | Per week      | Per sem. | Per week     | Per sem. | Per week        | Per sem. |         |
| I        |              | Allied-I | 4             | 60       | 4            | 60       | -               | -        | 4       |

#### **COURSE OBJECTIVES:**

- To learn about applications of chemistry in day to day life.

#### **COURSE OUTCOMES:**

On the successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | To learn about the dairy products used in our daily life.                | K3                      |
| CO2       | To learn about the various metallurgical processes, alloys and its uses. | K3                      |

|            |  |    |
|------------|--|----|
| <b>CO3</b> | To gain knowledge about the some pharmaceutical drugs, hormones, vitamins. and their functions                   | K3 |
| <b>CO4</b> | To learn about the confirmation tests for various functional groups and various reactions of carbohydrates.      | K2 |
| <b>CO5</b> | To learn about safety matches, fuel gases and applications of polymers, plastics and chromatographic techniques. | K3 |

\*CO – course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

#### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | M          | S          | S          |
| <b>CO2</b> | S          | S          | M          | M          | M          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | M          | M          | M          | S          | S          |
| <b>CO5</b> | S          | S          | M          | S          | S          | S          |

**(S-Strong; M-Medium; L-Low)**

#### **UNIT-I: Dairy Chemistry**

**12 hrs**

- 1.1 Definition –composition of milk – flavour and aroma of milk – processing of milk: boiling, pasturisation, homogenisation and sterilization-toned milk and double toned milk(definition).
- 1.2 Milk powder – definition – need for making milk powder – spray drying process (only flow chart) – ice cream – definition, stabilizer, emulsifier and flavouring agents – manufacture.

#### **UNIT-II: Metallurgy and Alloys**

**12 hrs**

- 2.1 General methods of extraction of metals – Types of ores – methods of ore dressing – reduction methods – types of refining – electrolytic, Van Arkel and zone refining – Extraction of Titanium.
- 2.2 Alloys-definition – composition and uses of bronze, stainless steel, solder, brass and duralumin.

#### **UNIT-III: Drug Chemistry**

**12 hrs**

- 3.1 Antibiotics – Definition, Structure and uses of penicillin, streptomycin and tetracyclins – Sulpha drugs – Definition and preparation of prontosil, sulphapyridine and sulphadiazine - uses.

- 3.2 Hormones – Definition – Functions of Insulin and Adrenaline – Vitamins – Definition – classification – water - soluble and fat-soluble – occurrence and deficiency diseases of Vitamin A, B, C, D, E and K.

**UNIT- IV: Organic Chemistry**

**12 hrs**

- 4.1 Confirmatory test for important reactions of organic functional groups – aldehydes (Schiff's and Tollen's test) – carboxylic acids (sodium bicarbonate , Phthalein fusion test and esterification) – phenols (neutral ferric chloride, Libermann's reaction) – primary amines (dye test) – diamide (sodium hydroxide and biuret test) – reducing sugars (Molish's, Fehling's and Tollen's test).
- 4.2 Carbohydrates – Classification, structure of glucose and sucrose oxidation, reduction and condensation reactions of glucose – Osazone - Mutarotation.

**UNIT-V: Industrial Chemistry**

**12 hrs**

- 5.1 Manufacture of safety matches – Fuel gases – Water gas – semi – water gas – carbureted water gas – Gobar gas – Composition and Uses, Silicones – applications.
- 5.2 Polymers – Classification of polymers – examples – Types of plastics and applications (not in detail) – Chromatography – Column, TLC, paper chromatography – principle and its applications.

**TEXT BOOK:**

| S. No. | Authors        | Title                                   | Publishers          | Year of publication |
|--------|----------------|---|---------------------|---------------------|
| 1.     | Jayashree Gosh | A Text book of Pharmaceutical Chemistry | S. Chand publishers | 2012                |

**REFERENCE BOOKS:**

| S. No. | Authors                                 | Title                            | Publishers             | Year of publication |
|--------|---|----------------------------------|------------------------|---------------------|
| 1.     | R.D. Madan                              | Inorganic Chemistry              | S. Chand Publications  | 2014                |
| 2.     | P.L. Soni                               | Text Book of Inorganic Chemistry | Sultan Chand           | 2006                |
| 3.     | Tewari.<br>N.K.Vishnoi,<br>S.N.Mehrotra | Organic Chemistry                | Vikas Publishing House | 2006                |
| 4.     | Jayashree Ghosh                         | A text book of Applied chemistry | S. Chand               | 2013                |

**TEACHING METHODOLOGY:**

- Power Point Presentations
- Assignments
- Animated videos
- Chalk and Board

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**ALLIED CHEMISTRY PAPER – II**

| Semester | Subject Code | Category  | Lecture hours |          | Theory hours |          | Practical hours |          | Credits |
|----------|--------------|-----------|---------------|----------|--------------|----------|-----------------|----------|---------|
|          |              |           | Per week      | Per sem. | Per week     | Per sem. | Per week        | Per sem. |         |
| II       |              | Allied-II | 4             | 60       | 4            | 60       | -               | -        | 4       |

**COURSE OBJECTIVES:**

- To know about some diseases, pharmaceutical drugs and the uses of some Indian medicinal plants.

**COURSE OUTCOMES:**

On the successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | To gain knowledge about the types, remedies of pollutions, uses of some fertilizers and the terms used in dyes.    | K3                      |
| CO2       | To gain knowledge about various Pharmaceutical drugs, Pharmaceutical and the causes and treatment of some diseases | K3                      |

|            |   |    |
|------------|---|----|
| <b>CO3</b> | To gain knowledge about aminoacids, proteins and nucleic acids.                         | K3 |
| <b>CO4</b> | To gain knowledge about silicates, theories of bonding and some coordination complexes. | K2 |
| <b>CO5</b> | To know about blood, some diseases and the uses of some Indian medicinal plants.        | K3 |

\*CO – course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

#### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | M          | S          | S          |
| <b>CO2</b> | S          | S          | M          | M          | M          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | M          | M          | M          | M          | S          |
| <b>CO5</b> | S          | M          | M          | S          | S          | S          |

**(S-Strong; M-Medium; L-Low)**

#### **UNIT – I: Industrial Chemistry**

**12 hrs**

- 1.1 Pollution – Air, water and soil pollution-Causes and remedies. Fertilizers – Preparation and uses of Superphosphate of lime, Triple superphosphate and Urea - Role of NPK (mixed fertilizers).
- 1.2 Dyes – definition – terms used – chromophore, chromogen, auxochromes – bathochromic, hypsochromic, hyperchromic and hypochromic shifts – classification- definition of azo dyes- preparation of methyl orange.

#### **UNIT – II: Medicinal Chemistry-I**

**12 hrs**

- 2.1 Definition and examples for analgesics, antipyretics, sedatives, Hypnotics and antiseptics – Tranquilizers – Anaesthetics – General and Local Anaesthetics.
- 2.2 Causes and treatment of Cancer, AIDS, Diabetes – Organic Pharmaceutical Aids-Preservatives, Antioxidants, Colouring, Flavouring, Sweetening agents – Examples.

#### **UNIT –III: Medicinal chemistry**

**12 hrs**

- 3.1 Blood: Composition, Rh factor, blood pressure, hypertension and hypotension Causes, symptoms and drugs for jaundice, cholera, malaria and filaria.
- 3.2 Indian medicinal plants and uses – Tulasi, Neem, Kizhanelli, Semparuthi, and Thoothuvalai.

#### **UNIT-IV: Aminoacids and Proteins**

**12 hrs**

- 4.1 Aminoacids – Classification of aminoacids – Essential and non – essential aminoacids – Preparation and properties of glycine – Structure of glycine.
- 4.2 Proteins – Classification of proteins based on physical properties and biological functions – Nucleic acids – Elementary ideas of structures of DNA and RNA – Biological functions.

**UNIT V: Inorganic chemistry****12 hrs**

- 5.1 Silicates – Preparation and structure. (Elementary treatment) Theory of bonding and antibonding orbitals – M.O. Diagrams of H<sub>2</sub>, O<sub>2</sub> and N<sub>2</sub>. Calculation of bond order.
- 5.2 Coordination Chemistry-Nomenclature (Modern). Werner's theory. Chelation – Hemoglobin, Chlorophyll, EDTA and its Applications.

**TEXT BOOK:**

| S. No. | Authors        | Title                                   | Publishers          | Year of publication |
|--------|----------------|---|---------------------|---------------------|
| 1.     | Jayashree Gosh | A Text book of Pharmaceutical Chemistry | S. Chand publishers | 2012                |

**REFERENCE BOOKS:**

| S. No. | Authors                                 | Title                            | Publishers             | Year of publication |
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| 3.     | Tewari.<br>N.K.Vishnoi,<br>S.N.Mehrotra | Organic Chemistry                | Vikas Publishing House | 2006                |
| 4.     | Jayashree Ghosh                         | A text book of Applied chemistry | S. Chand               | 2013                |

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- Chalk and Board

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- Mrs. J. Saranya, Assistant Professor, Department of Chemistry
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### ALLIED CHEMISTRY PRACTICALS

| Semester | Subject Code | Category   | Lecture hours |          | Theory hours |          | Practical hours |          | Credits |
|----------|--------------|------------|---------------|----------|--------------|----------|-----------------|----------|---------|
|          |              |            | Per week      | Per sem. | Per week     | Per sem. | Per week        | Per sem. |         |
| II       |              | Practicals | -             | -        | -            | -        | 3               | 45       | 2       |

### VOLUMETRIC ANALYSIS

#### ACIDIMETRY:

- 1) Estimation of hydrochloric acid using standard hydrochloric acid
- 2) Estimation of Borax using standard Borax
- 3) Estimation of NaOH using standard sodium carbonate
- 4) Estimation of oxalic acid using standard oxalic acid
- 5) Estimation of sodium carbonate using standard sodium carbonate

#### Permanganometry:

- 6) Estimation of Ferrous ammonium sulphate using standard Ferrous ammonium sulphate
- 7) Estimation of Oxalic acid using standard Oxalic acid Students must write short procedure for the given estimation in the examination and submit the paper for evaluation.

### ORGANIC ANALYSIS

Reactions of aldehyde (aromatic), carbohydrate, carboxylic acid (mono and dicarboxylic), phenol, aromatic primary amine, diamide. Systematic analysis of organic compounds containing one functional group and characterization by confirmatory tests.

#### TEACHING METHODOLOGY:

- Chalk and Board
- Demonstration
- Conducting Experiments
- Conducting Viva

#### SYLLABUS DESIGNER:

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- Mrs. J. Saranya, Assistant Professor, Department of Chemistry
- Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

### **SCHEME OF VALUATION FOR ALLIED CHEMISTRY PRACTICALS**

Internal assessment: 40 Marks

External assessment: 60 marks

Total: 100 marks

#### **Allied Practical:**

Max.marks: 60

Record: 10 marks

Volumetric Analysis : 30 marks

Organic Analysis : 20 marks

Volumetric Analysis : 30marks (Maximum)

Procedure : 5 marks

Error upto 2% : 25 marks

2.1 to 3% : 20 marks

3.1 to 4% : 15 marks

4.1 to 5 : 10 marks

>5% : 5 marks

Arithmetic error : To deduct 1 mark

Wrong calculation : To deduct 20% of marks scored

No calculation : To deduct 40% of marks scored

Organic Analysis : 20 marks

Preliminary Reactions : 4 marks

Aliphatic or Aromatic : 2 marks

Saturated or unsaturated : 2 marks

Tests for 3 elements : 6 marks (3 x 2)

Tests for functional group : 6 marks.

### **QUESTON PAPER PATTERN FOR THEORY PAPERS**

|           |  |                   |
|-----------|--|-------------------|
| Section-A | Answer ALL the Questions                             | 10 x 2 = 20 marks |
| Section-B | Answer ALL the Questions<br>(Either Or Pattern. Each | 5 x 5 = 25 marks  |

|           |   |                   |
|-----------|---|-------------------|
|           | question from each Unit)  |                   |
| Section-C | Answer any THREE out of FIVE questions<br>(One Question from each Unit) | 3 x 10 = 30 marks |

**Total = 75 Marks**

## **DEPARTMENT OF CHEMISTRY-PG**

### **PROGRAMME EDUCATIONAL OBJECTIVES**

The purpose of the postgraduate chemistry program at this institution is

- PEO1:** To offer students a more quantitative significant foundation in the principles of Chemistry by conducting academic, industrial scientific research via the academic conferences, workshops and to produce graduating national provisionally qualified personal who are necessary for the service of the community, government plans and programs of development, education and industry
- PEO2:** To prepare students for careers as professionals in the field of chemistry, biochemistry and related fields in various industries, colleges and for professional school including medical, dental, law and business programs by stepping them into the modern laboratory methods and principles using state-of-the-art scientific equipment.

### **PROGRAM OUTCOMES**

After completion of this program the candidate will be

- PO1:** To understand and apply the concepts of chemical and scientific theories with mastery approach.
- PO2:** To analyze quantitative and qualitative data, employ critical thinking and scientific inquiry.
- PO3:** A research oriented learning that develops analytical and integrative problem solving approaches.
- PO4:** To demonstrate their interpretational skills with understanding the theory background and contemporary chemical instrumentation.
- PO5:** To get specific placements in Colleges, R & D synthetic division of various chemical industries, Allied Division and to develop laboratory competence in

relating chemical structure to spectroscopic phenomena.

**PO6:** To pursue global level research opportunities like Ph.D programme, postdoctoral fellowship, Junior and senior research fellowship and also the targeted approach of CSIR – NET/SET/Competitive examinations.

## PG Department of Chemistry with effect from 2019-2020

### CBCS PATTERN

#### The course of study and Scheme of Examination

| S. No.     | Study components |               | Ins. Hrs/ Week | Credit | Title of the paper   | Maximum marks |            |       |
|------------|------------------|---------------|----------------|--------|--|---------------|------------|-------|
|            | Course Title     |               |                |        |  | CIA           | Sem.. Exam | Total |
| SEMESTER I |                  |               |                |        |  |               |            |       |
| 1          | Core             | Paper I       | 4              | 4      | Structure and bonding of Inorganic compounds   | 25            | 75         | 100   |
| 2          | Core             | Paper II      | 4              | 4      | Substitution reactions and stereochemistry   | 25            | 75         | 100   |
| 3          | Core             | Paper III     | 4              | 4      | Chemical kinetics and electrochemistry   | 25            | 75         | 100   |
| 4          | Elective         | Paper I       | 3              | 3      | (Choose any one out of three)<br>a.Bioinorganic Chemistry and Separation Techniques<br>b. Drug Design<br>c.Green Chemistry | 25            | 75         | 100   |
| 5          | Core             | Practical I   | 5              | 0      | Organic Chemistry Practical – I  | -             | -          | -     |
| 6          | Core             | Practical II  | 5              | 0      | Inorganic Chemistry Practical – I  | -             | -          | -     |
| 7          | Core             | Practical III | 5              | 0      | Physical Chemistry Practical – I   | -             | -          | -     |
| 8          | Optional         | Self Study    | -              | 2*     | Environmental Chemistry for  | 25            | 75         | -     |

|   |          |                  |           |           |  |    |    |            |
|---|----------|------------------|-----------|-----------|--|----|----|------------|
|   |          | Paper            |           |           | sustainable world  |    |    |            |
|   |          |                  | <b>30</b> | <b>15</b> |  |    |    | <b>400</b> |
| <b>SEMESTER II</b>  |          |                  |           |           |  |    |    |            |
| 9   | Core     | Paper IV         | 3         | 3         | Coordination chemistry   | 25 | 75 | 100        |
| 10  | Core     | Paper V          | 3         | 3         | Organic Reaction mechanisms and Rearrangements   | 25 | 75 | 100        |
| 11  | Core     | Paper VI         | 4         | 4         | Quantum Chemistry and Analytical Techniques  | 25 | 75 | 100        |
| 12  | Elective | Paper II         | 3         | 3         | (Choose any one out of three)<br>a. Modern Synthetic Strategies and Renewable Energy Resources<br>b. Pharmaceutical Chemistry<br>c. Heterocyclic chemistry | 25 | 75 | 100        |
| 13  |          | Compulsory paper | 2         | 2         | Human rights   | 25 | 75 | 100        |
| 14  | Core     | Practical I      | 5         | 5         | Organic Chemistry Practical – I  | 40 | 60 | 100        |
| 15  | Core     | Practical II     | 5         | 5         | Inorganic Chemistry Practical – I  | 40 | 60 | 100        |
| 16  | Core     | Practical III    | 5         | 5         | Physical Chemistry Practical – I   | 40 | 60 | 100        |
|   |          |                  | <b>30</b> | <b>30</b> |  |    |    | <b>800</b> |
| <b>* Optional Internship Training during summer Vacation with an extra credit:1-3</b> |          |                  |           |           |  |    |    |            |

|                     |      |           |   |   |   |    |    |     |
|---------------------|------|-----------|---|---|---|----|----|-----|
| <b>SEMESTER III</b> |      |           |   |   |   |    |    |     |
| 17                  | Core | Paper VII | 4 | 4 | Inorganic Photochemistry and Organometallic Chemistry | 25 | 75 | 100 |

|                    |          |                  |           |           |  |    |    |            |
|--------------------|----------|------------------|-----------|-----------|--|----|----|------------|
| 18                 | Core     | Paper VIII       | 4         | 4         | Spectroscopy and Applications  | 25 | 75 | 100        |
| 19                 | Core     | Paper IX         | 4         | 4         | Thermodynamics and group theory  | 25 | 75 | 100        |
| 20                 | Elective | Paper III        | 3         | 3         | (Choose any one out of three)<br>a. Material Chemistry<br>b. Biomaterials<br>c. Industrial Chemistry | 25 | 75 | 100        |
| 21                 | Core     | Practical IV     | 5         | 0         | Organic Chemistry Practical – II   | -  | -  | -          |
| 22                 | Core     | Practical V      | 5         | 0         | Inorganic Chemistry Practical – II   | -  | -  | -          |
| 23                 | Core     | Practical VI     | 5         | 0         | Physical Chemistry Practical – II  | -  | -  | -          |
| 24                 | Optional | Self Study Paper | -         | 2*        | Online course  | -  | -  | -          |
|                    |          |                  | <b>30</b> | <b>15</b> |  |    |    | <b>400</b> |
| <b>SEMESTER IV</b> |          |                  |           |           |  |    |    |            |
| 25                 | Core     | Paper X          | 6         | 5         | Photochemistry, pericyclic reactions, heterocycles and natural products                              | 25 | 75 | 100        |
| 26                 | Elective | Paper IV         | 3         | 3         | (Choose any one out of three)<br>a. Scientific Research  | 25 | 75 | 100        |

|              |      |                  |            |           |   |    |                     |             |
|--------------|------|------------------|------------|-----------|---|----|---------------------|-------------|
|              |      |                  |            |           | Methodology<br>b. Supramolecular Chemistry<br>c. Nanoscience and Technology |    |                     |             |
| 27           |      | Compulsory paper | -          | 2         | Comprehensive Viva  | -  | 100                 | 100         |
| 28           | Core | Practical IV     | 5          | 5         | Organic Chemistry Practical – II  | 40 | 60                  | 100         |
| 29           | Core | Practical V      | 5          | 5         | Inorganic Chemistry Practical – II  | 40 | 60                  | 100         |
| 30           | Core | Practical VI     | 5          | 5         | Physical Chemistry Practical – II   | 40 | 60                  | 100         |
| 31           | Core | Project          | 6          | 5         | Project with Viva Voce  | 25 | 75<br>D:60;<br>V-15 | 100         |
|              |      |                  | <b>30</b>  | <b>30</b> |   |    |                     | <b>700</b>  |
| <b>Total</b> |      |                  | <b>120</b> | <b>90</b> |   |    |                     | <b>2300</b> |

**PG DEPARTMENT OF CHEMISTRY**

| Subject        | Papers | Credit            | Total Credits | Marks | Total Marks |
|----------------|--------|-------------------|---------------|-------|-------------|
| Main Paper     | 10     | 4x7<br>5x1<br>3x2 | 39            | 100   | 1000        |
| Main Practical | 6      | 5                 | 30            | 100   | 600         |
| Elective Paper | 4      | 3                 | 12            | 100   | 400         |

|                  |           |   |           |     |             |
|------------------|-----------|---|-----------|-----|-------------|
| Compulsory Paper | 2         | 2 | 4         | 100 | 200         |
| Project          | 1         | 5 | 5         | 100 | 100         |
| <b>Total</b>     | <b>23</b> | - | <b>90</b> | -   | <b>2300</b> |

### PAPER-I: STRUCTURE AND BONDING OF INORGANIC COMPOUNDS

| Semester | Subject Code | Category | Instruction Hours |              |          |              |           |              | Credits |
|----------|--------------|----------|-------------------|--------------|----------|--------------|-----------|--------------|---------|
|          |              |          | Lecture           |              | Theory   |              | Practical |              |         |
|          |              |          | Per Week          | Per Semester | Per Week | Per Semester | Per Week  | Per Semester |         |
| I        |              | Core     | 4                 | 60           | 4        | 60           | 0         | 0            | 4       |

### COURSE OBJECTIVES

- ❖ To provide knowledge of basic and advanced concepts in bonding and enable the students to identify the structure and bonding of simple molecules.
- ❖ To provide an understanding of the various types of solid state packing, types of chemical forces, structure of inorganic chain cluster compounds and the bonding in boron compounds.

### COURSE OUTCOMES

- On the successful completion of course, students will be able to

| CO Number  | CO statement  | Knowledge level    |
|------------|---|--------------------|
| <b>CO1</b> | Gain the knowledge on hybridization, structure and bonding in inorganic molecules | <b>K2 &amp; K3</b> |
| <b>CO2</b> | Gain the knowledge on structure and packing in solids                             | <b>K2 &amp; K3</b> |
| <b>CO3</b> | Acquire knowledge about the crystal lattices and the diffraction methods          | <b>K3</b>          |
| <b>CO4</b> | Have a better understanding of boron compounds and clusters.                      | <b>K2 &amp; K4</b> |



|            |  |                    |
|------------|--|--------------------|
| <b>CO5</b> | Notify different types of inorganic chains and cluster compounds | <b>K3 &amp; K4</b> |
|------------|--|--------------------|

\*CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

#### **MAPPING WITH PROGRAM OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | M          | S          | M          | S          | M          |
| <b>CO2</b> | M          | S          | M          | S          | M          | M          |
| <b>CO3</b> | M          | M          | S          | S          | M          | M          |
| <b>CO4</b> | M          | M          | S          | S          | M          | S          |
| <b>CO5</b> | M          | M          | M          | M          | S          | S          |

#### **UNIT I: CHEMICAL BONDING**

**12 hrs**

V.B. approach to bonding-Hitler-London, Pauling and Slater refinements, Concept of hybridization and structure of molecules, VSEPR theory shapes of molecules. M.O. approach to covalent bonding – symmetry and overlap of atomic orbitals – symmetry of molecular orbitals – sigma and pi bonding – energy levels in homo and heteronuclear diatomic systems – bond length, bond order and bond energy, Application to small molecules such as BeCl<sub>2</sub>, BCl<sub>3</sub> and CCl<sub>4</sub>, SF<sub>4</sub>, etc, ionic character in a covalent bond - The concept of multicentre bonding. Pseudo halogens: Structure and bonding in ClF<sub>3</sub>, BrF<sub>3</sub>, BrF<sub>5</sub>, IF<sub>5</sub> and IF<sub>7</sub>. Oxides and oxyacids of halogens, Bonding in Noble gas compounds – XeCl<sub>2</sub>, XeF<sub>4</sub>, XeOF<sub>4</sub> and XeF<sub>6</sub>.

#### **UNIT II: CHEMISTRY OF SOLID STATE I: STRUCTURE**

**12 hrs**

Weak Chemical forces: van der Waals forces, Hydrogen bonding – Close packing of atoms and ions HCP and BCC types of packing voids – radius ratio – derivation – its influence on structures – Lattice energy – Born – Lande equation – Kapustinski equation – Madelung constant.

Representative structures of AB and AB<sub>2</sub> types of compounds – rock salt, cesium chloride, wurtzite, zinc blende, rutile, fluorite, antiferite, cadmium iodide and nickel arsenide – Structure of graphite and diamond – Spinel – normal and inverse types and perovskite structures.

### UNIT III: CHEMISTRY OF SOLID STATE II: DIFFRACTION METHODS 12hrs

Band theory of solids – non – stoichiometry- point defects – linear defects – effects due to dislocations-electrical properties of solids – conductor, insulator, semiconductor – intrinsic – impurity semiconductors – optical properties – lasers and phosphors – elementary study of liquid crystals.

Difference between point group and space group – screw axis – glide plane – symmetry elements – relationship between molecular symmetry and crystallographic symmetry – The Concept of reciprocal lattice – X- ray diffraction by single crystal – rotating crystal – powder diffraction. Neutron diffraction: Elementary treatment – comparison with X-ray diffraction – Electron diffraction –Basic principle – Crystal Growth methods: From melt and solution (hydrothermal, Gel methods).

### UNIT IV: BORON COMPOUNDS AND CLUSTERS

12 hrs

Chemistry of boron – Preparation, properties and structure of boranes, higher boranes - types of boranes closo, nido, arachno. ( $B_2H_6$ ,  $B_4H_{10}$ ,  $B_5H_{11}$ ,  $B_6H_{10}$ ,  $B_{10}H_{14}$ ) linear and cyclic borazines ( $B_3N_3H_6$ ), boron nitrides  $(BN)_x$  and borates ions — STYX numbers, Wade's rules .

Carboranes ( $C_2B_9H_{11}^{2-}$ ), Metallocarboranes ( $1,2-C_2B_{10}H_{12}$ ), Metalloboranes ( $BnHn^{2-}$ ) – preparation, properties and Structure – a general study. Metal clusters: Chemistry of low molecularity metal clusters only – Structure of  $Re_2Cl_8$ ; multiple metal – metal bonds.

### UNIT V: INORGANIC CHAIN AND CLUSTER COMPOUNDS

12 hrs

Types of inorganic polymers – comparison with organic polymers – silanes, higher silanes ( $Si_2H_6$ ,  $Si_4H_{10}$ ) – multiple bonded systems – silicon carbides, siloxanes. P- N compounds, cyclophosphazenes and cyclophosphazanes – S-N compounds –  $S_4N_4$ ,  $S_4N_4H_4$  and  $(SN)_x$ .

Isopoly acids – polyvanadates, polymolybdates, polytungstates – heteropolyacids and their salts – structure of silicates - applications of Paulings rule of electrovalence - isomorphous replacements in silicates – ortho, meta and pyrosilicates – one dimensional, two dimensional and three dimensional silicates – silazenes - preparation, properties and structure.

**Distribution of Marks:** Theory-80% and Problems-20%

### TEXT BOOKS

| S. No. | Authors     | Title  | Publishers                           | Year of publication |
|--------|-------------|--|--------------------------------------|---------------------|
| 1.     | J.E. Huheey | Inorganic Chemistry – Principles, Structure and Reactivity | Harper Collins, New York, IV Edition | 1993                |

|     |   |   |  |      |
|-----|---|---|--|------|
| 2.  | D. E. Douglas,<br>D.H. McDaniel<br>and J. J.<br>Alexander | Concepts and Models in<br>Inorganic Chemistry             | 3 <sup>rd</sup> Ed                               | 1994 |
| 3.  | M. C. Day, J.<br>Selbin                                   | Theoretical Inorganic<br>Chemistry                        | 2 <sup>nd</sup> Ed, East West<br>Press           | 1985 |
| 4.  | L. Pauling  | The Nature of the<br>Chemical Bond                        | 3 <sup>rd</sup> Ed., Cornell<br>University Press | 1960 |
| 5.  | F.A. Cotton and<br>G. Wilkinson                           | Advanced Inorganic<br>Chemistry – A<br>Comprehensive Text | John Wiley and<br>Sons, V Edition                | 1988 |
| 6.  | D.F. Shriver, P.W.<br>Atkins                              | Inorganic Chemistry                                       | 3 <sup>rd</sup> Ed                               | 1999 |
| 7.  | A.G. Sharpe   | Inorganic Chemistry                                       | Pearson Education                                | 2008 |
| 8.  | N. H. Ray   | Inorganic Polymers  | Academic Press                                   | 1978 |
| 9.  | A. R. West  | Basic Solid State<br>Chemistry                            | John Wiley                                       | 1991 |
| 10. | E. L. Muetterli   | Polyhedral Boranes  | Academic Press,<br>NY                            | 1975 |

### **REFERENCE BOOKS**

| <b>S.No</b> | <b>Authors</b>                | <b>Title</b>           | <b>Publishers</b>       | <b>Year of publication</b> |
|-------------|-------------------------------|------------------------|-------------------------|----------------------------|
| 1.          | S.F.A. Kettle                 | Coordination Chemistry | EIBS                    | 1973                       |
| 2.          | K. Burger                     | Coordination Chemistry | Burter Worthy           | 1973                       |
| 3.          | K.F. Purcell and<br>J.C. Kotz | Inorganic Chemistry    | WB Saunders<br>Co., USA | 1977                       |

### **TEACHING METHODOLOGY:**

- PowerPoint presentation
- Models
- Group discussion
- Seminar and Assignments
- Animated videos
- Board and chalk

**SYLLABUS DESIGNERS:**

1. Dr.P.N.Sudha, Principal, Department of Chemistry
2. Dr.M.Nagarathinam, Head & Associate Professor, Department of Chemistry
3. Dr.S.Santha Lakshmi, Assistant Professor, Department of Chemistry
4. Dr.S.Sashikala, Assistant Professor, Department of Chemistry
5. Dr.N.Dhanam, Assistant Professor, Department of Chemistry
6. Dr. K. Vijayalakshmi, Assistant Professor, Department of Chemistry
7. Dr. T. Gomathi, Assistant Professor, Department of Chemistry
8. Mrs. J. Saranya, Assistant Professor, Department of Chemistry
9. Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

**PAPER-II: SUBSTITUTION REACTIONS AND STEREOCHEMISTRY**

| Semest<br>er | Subje<br>ct<br>Code | Catego<br>ry | Instruction Hours |                     |                 |                     |                 |                     | Credi<br>ts |
|--------------|---------------------|--------------|-------------------|---------------------|-----------------|---------------------|-----------------|---------------------|-------------|
|              |                     |              | Lecture           |                     | Theory          |                     | Practic<br>al   |                     |             |
|              |                     |              | Per<br>Wee<br>k   | Per<br>Semest<br>er | Per<br>Wee<br>k | Per<br>Semest<br>er | Per<br>Wee<br>k | Per<br>Semest<br>er |             |
| I            |                     | Core         | 4                 | 60                  | 4               | 60                  | 0               | 0                   | 4           |

**COURSE OBJECTIVES:**

- ❖ Understanding the fundamental mechanism involved in electrophilic reactions, nucleophilic reactions and reactions that involve transient species.
- ❖ Understanding the basic aspects of stereochemistry such as chirality, nomenclature, stereoselectivity Vs stereospecificity, asymmetric synthesis and the conformational analysis of six membered ring systems.

**COURSE OUTCOMES:**

- On the successful completion of course, students will be able to achieve excellency in education as follows

| CO Number  | CO statement   | Knowledge level    |
|------------|--|--------------------|
| <b>CO1</b> | Gain knowledge about aromaticity, isotopic labeling techniques, kinetic isotope effect and the ambident nucleophiles   | <b>K2 &amp; K4</b> |
| <b>CO2</b> | Get clear idea about the nucleophilic attack on saturated carbon atoms leading to substitution reactions, different mechanisms of nucleophilic substitution, effect of solvent on the rate of reaction, neighbouring group participation and the alkylation of active methylene compounds. | <b>K2 &amp; K3</b> |
| <b>CO3</b> | Use various reagents in a logical manner in organic synthesis, understand various types of aromatic electrophilic substitution,  | <b>K3 &amp; K4</b> |

|            |   |                    |
|------------|---|--------------------|
|            | nucleophilic substitution reaction and their mechanism  |                    |
| <b>CO4</b> | Gain knowledge about basic principles of stereochemistry, to apply various concepts such as stereochemistry and fundamental principles of stereoselectivity in organic chemistry and also to identify and differentiate prochirality and chirality at centers, axis, planes and helices and determine the absolute configuration. | <b>K2 &amp; K3</b> |
| <b>CO5</b> | Acquire good foundation about conformational analysis and to differentiate the reactive intermediates can be differentiated by their unique properties through various reaction pathways to develop new and notable aromatic organic compounds  | <b>K3 &amp; K4</b> |

\*CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

### MAPPING WITH PROGRAM OUTCOMES

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | S          | S          | M          | M          | M          |
| <b>CO2</b> | M          | S          | M          | M          | S          | M          |
| <b>CO3</b> | M          | M          | M          | S          | S          | M          |
| <b>CO4</b> | M          | S          | S          | S          | S          | M          |
| <b>CO5</b> | M          | M          | S          | S          | S          | M          |

### UNIT-I: AROMATICITY AND REACTION MECHANISM

**12 hrs**

Aromaticity of benzenoid, heterocyclic and non – benzenoid compounds – Huckel’s rule –Annulenes. Kinetic and Non kinetic methods of determining organic reaction mechanisms – Isolation and trapping of intermediates – Isotopic labeling studies – Primary Kinetic Isotopic effect. Generation of Kinetic and Thermodynamic enolates – Hammett equation-simple problems and Taft equation. Significance of reaction as well as substituent constants – Ambident nucleophiles such as  $\text{CN}^-$ ,  $\text{NO}_2^-$ , phenoxide and ambident dianions – Williamsons ether synthesis.

### UNIT-II: ALIPHATIC NUCLEOPHILIC SUBSTITUTION

**12 hrs**

Mechanism of nucleophilic substitution reaction:  $\text{S}_\text{N}^1$ ,  $\text{S}_\text{N}^2$  and  $\text{S}_\text{N}^i$  mechanisms – Solvent and leaving group effects and neighbouring group participation (NGP) – Substitution at carbonyl, vinylic and bridgehead system – Substitution with ambident nucleophiles- “O” Vs “C” alkylation. Role of LDA – crown ethers and phase transfer catalysts (PTC) in nucleophilic substitution reactions.

Generation of enolates – enolate selectivity (Kinetic Vs Thermodynamic) – alkylation of enolates and stereochemistry of enolate alkylation – Mechanism of ester hydrolysis – Alkylation of active methylene compounds. Asymmetric alkylation

(Evans, Enders and Meyers procedures) – Preparation and synthetic utility of enamines, Finkelstein reaction – Wurtz coupling.

### **UNIT-III: AROMATIC ELECTROPHILIC AND NUCLEOPHILIC SUBSTITUTION REACTIONS**

**12 hrs**

Aromatic electrophilic substitution: mechanism of nitration, sulfonation, Friedel – Crafts alkylation and acylation reactions – Synthesis of di and trisubstituted benzenes from benzene or monosubstituted benzenes (symmetrical tribromo benzene, 2-amino 5-methylphenol, 3 - nitro 4-bromobenzoic acid, 3, 4-dibromonitrobenzene, 1,2,3 - trimethylbenzene) – Hammett and Hammett-Taft equation – Haworth reaction (for naphthalene), Scholl reaction, Vilsmeier-Haack formylation, Gattermann reaction, Reimer– Tiemann and Bischler – Napieralski reactions.

Aromatic nucleophilic substitution in aryl halides by Meisenheimer complex mechanism and benzyne mechanism. Reactions of aryl diazonium salts – Zeigler alkylation, Vicarious Nucleophilic Substitution (VNS), Chichibabin and Schiemann reactions.

### **UNIT-IV: STEREOCHEMISTRY**

**12 hrs**

Chirality, Symmetry elements, Asymmetric and Dissymmetric chiral molecules – Calculation of number of optical isomers – Stereochemistry of mono and disubstituted cyclopropane, cyclobutane, cyclopentane and cyclohexane – Stereochemistry of tri-substituted cyclopentane, trisubstituted pentane and tetrasubstituted hexane. Description of various types of optically active compounds including allenes, cumulenes, spiranes, biphenyls, *trans* – cyclooctene.

Compounds containing two asymmetric centers; Erythro and threo isomers – Conversion of Fischer projection into perspective forms – Erythro and Threo – Inter conversion of Fischer to Sawhorse and Newman projections – Zig-Zag representation of glucose – Interpretation of homotopic, enantiotopic and diastereotopic atoms and faces – Pro-chiral carbon – Concept of *Re*- and *Si*- faces – R and S nomenclature of simple compounds – allenes, spiranes and biphenyls – Stereospecific and Stereoselective reactions – Asymmetric Synthesis-Cram's rule and Felkin-Anh model. E-Z nomenclature of olefins.

### **UNIT-V: REACTIVE INTERMEDIATES AND CONFORMATIONAL ANALYSIS**

**12 hrs**

Organic reactive intermediates: Generation, stability and reactivity of carbocations, carbanions, free radicals, carbenes, carbenoids, benzyne and nitrenes.

Conformation of some simple 1, 2 – disubstituted ethane derivatives – Conformational analysis of disubstituted cyclohexane and their stereochemical 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) – Conformation and stereochemistry of cis and trans decalin and 9 – methyldecalin.

**Distribution of Marks:** Theory-80% and Problems-20%

### **TEXT BOOKS**

| <b>S.No</b> | <b>Authors</b>               | <b>Title</b>  | <b>Publishers</b>  | <b>Year of publication</b> |
|-------------|------------------------------|---|--|----------------------------|
| 1.          | S.M. Mukherji and S.P. Singh | Organic Reaction Mechanism                            | McMillan India Ltd., Chennai                             | 1990                       |
| 2.          | Stanley Pine                 | Organic Chemistry                                     | V Edition, Tata McGraw-Hill Pub.,                        | 1990                       |
| 3.          | Jerry March                  | Advanced organic reaction mechanism and structure     | Tata McGraw-Hill Pub., 5 <sup>th</sup> edition           | 2001                       |
| 4.          | Mc Murray                    | Organic Chemistry                                     | V-edition, Thomson Asia Pvt., Ltd.                       | 2001                       |
| 5.          | Graham Solomons              | Organic Chemistry                                     | John Wiley & Sons Ltd.,                                  | 2000                       |
| 6.          | P.S. Kalsi                   | Stereochemistry, Conformation analysis and Mechanism  | 2 <sup>nd</sup> Edition, Wiley Eastern Limited, Chennai. | 1993                       |
| 8.          | P.S. Kalsi                   | Stereochemistry and Mechanism through solved problems | Wiley Eastern Ltd  | 1994                       |
| 9.          | R.K. Bansal                  | Organic Reaction Mechanism                            | IV Edition, New Age Int.,(P) Ltd.,                       | 2003                       |
| 11.         | Peter Sykes                  | A Guidebook to mechanism in organic chemistry         | Orient Longman Ltd.                                      | 1999                       |

### **REFERENCE BOOKS**

| <b>S.No</b> | <b>Authors</b>              | <b>Title</b>                            | <b>Publishers</b>                                     | <b>Year of publication</b> |
|-------------|-----------------------------|---|---|----------------------------|
| 1.          | F. Carey and R. J. Sundberg | Advanced Organic Chemistry-Part A and B | Springer Science + Business Media, 5 <sup>th</sup> Ed | 2007                       |
| 2.          | M. B. Smith and Jerry March | Advanced Organic Chemistry              | John Wiley & Sons, 5 <sup>th</sup> Ed                 | 2001                       |

|     |                                      |   |  |      |
|-----|--------------------------------------|---|--|------|
| 3.  | J. Clayden, N. Greeves and S. Warren | Organic Chemistry   | Oxford University Press 2 <sup>nd</sup> Ed | 2012 |
| 4.  | M. B. Smith                          | Organic Synthesis   | Academic Press, 3 <sup>rd</sup> Ed         | 2011 |
| 5.  | R. O. C. Norman and J. M. Coxon,     | Principles of Organic Synthesis   | Chapman & Hall, 3 <sup>rd</sup> Ed         | 1993 |
| 6.  | Stuart Warren                        | Organic Synthesis: Disconnection Approach                                     | Wiley India (P) Ltd                        | 2007 |
| 7.  | I. L. Finar                          | Organic Chemistry Vol 2: Stereochemistry and the Chemistry of Natural product | Dorling Kindersley India (P) Ltd           | 2009 |
| 8.  | E. N. Eliel                          | Stereochemistry of Carbon Compounds   | Tata McGraw Hill Ed, Reprint               | 2008 |
| 9.  | D. Nasipuri                          | Stereochemistry of Organic Compounds  | New Age International (P) Ltd, Reprint     | 2005 |
| 10. | E. L. Eliel and S. H. Wilen          | Stereochemistry of Organic Compounds  | Wiley India Ed                             | 2008 |

#### **TEACHING METHODOLOGY:**

- PowerPoint presentation
- Models
- Group discussion
- Seminar and Assignments
- Animated videos
- Board and chalk

#### **SYLLABUS DESIGNERS:**

1. Dr.P.N.Sudha, Principal, Department of Chemistry
2. Dr.M.Nagarathinam, Head & Associate Professor, Department of Chemistry
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5. Dr.N.Dhanam, Assistant Professor, Department of Chemistry
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7. Dr. T. Gomathi, Assistant Professor, Department of Chemistry
8. Mrs. J. Saranya, Assistant Professor, Department of Chemistry
9. Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry



### PAPER-III: CHEMICAL KINETICS AND ELECTROCHEMISTRY

| Semester | Subject Code | Category | Instruction Hours |              |          |              |           |              | Credits |
|----------|--------------|----------|-------------------|--------------|----------|--------------|-----------|--------------|---------|
|          |              |          | Lecture           |              | Theory   |              | Practical |              |         |
|          |              |          | Per Week          | Per Semester | Per Week | Per Semester | Per Week  | Per Semester |         |
| I        |              | Core     | 4                 | 60           | 4        | 60           | 0         | 0            | 4       |

#### **COURSE OBJECTIVES**

- ❖ To understand the kinetics of chemical kinetics and explore the reaction kinetics of fast reactions .
- ❖ To learn the various techniques, mechanism of involved in catalysis and understanding of the Ionic activity, ionic interactions, Debye-Hückel-Bjerrum model, Debye-Hückel limiting law, Debye-Hückel theory of strong electrolytes, electrical double layer, electrocapillary phenomena, surfactants, design and applications of the batteries, Fuel Cells, Corrosion and its Protection.

#### **COURSE OUTCOMES:**

- On the successful completion of course, students will be able to

| CO Number  | CO statement   | Knowledge level    |
|------------|--|--------------------|
| <b>CO1</b> | Learn the reaction rate theories and reactions in solution and to explore the knowledge in kinetics  | <b>K2 &amp; K4</b> |
| <b>CO2</b> | Solve problems on rate/rate constants/efficiency for unimolecular and bimolecular reactions and Plot equations and functions representing kinetic behaviour. | <b>K2 &amp; K4</b> |
| <b>CO3</b> | Gain clear concepts about transition in Jablonski diagram and photo catalysis reaction   | <b>K2 &amp; K3</b> |
| <b>CO4</b> | Acquire knowledge about strong electrolytes and based on Debye-Huckel limiting law certain problems can be solved.   | <b>K3 &amp; K4</b> |
| <b>CO5</b> | Understand the designs of batteries, Fuel cells and ion selective electrodes   | <b>K2 &amp; K3</b> |

\* CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

#### **MAPPING WITH PROGRAM OUTCOMES**

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | S   | M   | S   | S   | M   |
| <b>CO2</b> | M   | S   | S   | M   | M   | S   |
| <b>CO3</b> | M   | M   | S   | M   | M   | M   |
| <b>CO4</b> | M   | M   | M   | S   | M   | M   |
| <b>CO5</b> | M   | M   | S   | S   | S   | M   |

**UNIT-I: CHEMICAL KINETICS****12 hrs**

Effect of temperature on reaction rates – collision theory of reaction rate: Lewis rigid sphere theory – molecular beams – collision cross sections – effectiveness of collisions – Potential energy surfaces – partition function and activated complex – Absolute reaction rate theory – Thermodynamic terms-Significance of entropy and volume of activation – Reactions in solution: factors determining reaction rates in solutions, effect of dielectric constant and ionic strength, – Bronsted –Bjerrum equation – Primary and Secondary salt effect, influence of solvent on reaction rates.

**UNIT-II: CHEMICAL DYNAMICS AND CATALYSIS****12 hrs**

Acid base catalysis – Mechanism of acid base catalyzed reaction, Bronsted Catalysis Law – Enzyme catalysis and its mechanism, Michaelis – Menten equation, effect of pH and temperature on enzyme catalysis – Mechanism of enzyme inhibition kinetics of surface reactions – Unimolecular reactions-Bimolecular reactions-Langmuir Hinshelwood and Elay-Rideal mechanism, Rice – Ramsperger – Kassel(RRK) theory. Rice-Ramsperger – Kassel – Marsus (RRKM) theory.

Study of fast reactions by stopped flow techniques – relaxation method, flash photolysis and the nuclear magnetic resonance method.

Linear free energy relationship – Hammett equation – Taft equation-Separation of polar, resonance and steric effects.

**UNIT-III: INTRODUCTION TO PHOTOCHEMISTRY****12 hrs**

Jablonski diagram, Primary and Secondary Processes, quantum yield and its determination – chemical actinometer. Excimers and exciplexes – Kinetics of collisional quenching – Stern Volmer equations. Photochemical reactions - photoredox, photosubstitution, photoisomerization and photosensitized reactions - photovoltaic and photogalvanic cells. Chemiluminescence, Photoassisted electrolysis of water, Photosynthesis, solar energy conversions. Semiconductor photocatalysis – lasers.

Radiation Chemistry – linear energy transfer, G – value, dosimeters, radiolysis of water, solvated electrons.

**UNIT IV: ELECTROCHEMISTRY – I****12 hrs**

Deviation from ideal behavior ion – solvent and ion – ion interactions – Debye–Hückel – Bjerrum model, Ion association and triple ion formations – Expression for the mean activity coefficient – Debye – Hückel limiting law and its applications – Diverse ion effect – Van't Hoff factor and its relation to colligative properties – Debye – Hückel theory of strong electrolytes –Debye – Hückel length and potential around a central ion and its interpretation – Transport of ions in Solution: Electrolytic conduction- Debye –

Hückel – Onsager treatment of strong electrolytes- ionic atmosphere- Anomalous conductance of nonaqueous electrolytes.

## UNIT V: ELECTROCHEMISTRY- II

12 hrs

Diffusion – Fick's law of diffusion – electrokinetic phenomena-membrane potential. Electrical double layer – Electrocapillary phenomena – Surfactants – Lipmann's equation – Electrokinetic phenomena – Zeta potential and its applications – Structure of electrical double layer – Helmholtz – Perrin, Guoy – Chapmann and Stern models – Butler –Volmer equation for one electron transfer reaction - equilibrium and exchange current densities and symmetry factor – transfer coefficient – Cyclic voltammetry and Stripping voltammetry – principle – instrumentation- Corrosion and passivation of metals – Pourbaix diagram – Evans diagram –Batteries and Fuel cells- Ion selective electrodes.

**Distribution of Marks:** Theory-80% and Problems-20%

### TEXT BOOKS

| S.No | Authors  | Title  | Publishers                                    | Year of publication |
|------|--|--|---|---------------------|
| 1.   | R. G. Frost and Pearson                                      | Kinetics and Mechanism                             | Wiley New York,                               | 1961                |
| 2.   | C. Capellos and B. H. J. Bielski,.                           | Kinetic Systems                                    | Wiley Interscience, New York                  | 1968.               |
| 3.   | K. J. Laidler  | Chemical Kinetics                                  | Harper and Row, New York,                     | 1987                |
| 4.   | Rajaram and J.C.Kuriacose                                    | Kinetics and Mechanism Of Chemical Transformations | Macmillan India Ltd.                          | 1993                |
| 5.   | G. M. Harris   | Chemical Kinetics                                  | D. C. Heathand Co,                            | 1966                |
| 6.   | A. W. Anderson   | Physical Chemistry of Surfaces                     | Wiley - Interscience, Newyork                 | 1990                |
| 7.   | Paula, Peter Atkins and Julio de                             | Elements of Physical chemistry                     | 5th Ed, Oxford U. P                           | 2012                |
| 8.   | John O'M Bockris, Amula K. N. Reddy, and Maria Gamboa-Aldeco | Modern Electrochemistry 2A, 2nd Ed,                | Kluwer Academic / Plenuim Publishers, NewYork | 2000                |

|     |  |                                    |   |       |
|-----|--|------------------------------------|---|-------|
| 9.  | Mordechay Schlesinger                                  | Modern Aspects of Electrochemistry | Issue 43, Springer, Netherlands           | 2009  |
| 10. | G. L. Agarwal  | Basic Chemical Kinetics            | Tata McGraw Hill                          | 1990  |
| 11. | K. J. Laidler  | Chemical Kinetics                  | Tata Mc Graw Hill                         | 1990  |
| 12. | Robert J Silbey, Robert A Alberty and Mounji G Bawendi | Physical Chemistry                 | 4 <sup>th</sup> Ed,NJ Hoboken: Wiley      | 2015  |
| 13. | N. J. Turro  | Modern molecular photochemistry    | Benjamin/Cummings, Menlo Park, California | 1978  |
| 14. | Reise G. W. Castellan,                                 | Physical Chemistry                 | Narosa publishing House ,New Delhi, Ed,   | 2011  |
| 15. | Gordon. M. Barrow                                      | Physical Chemistry                 | Tata McGraw Hill Edition, New York,       | 2011  |
| 16. | L. R. Puri, Y. R. Sharma and R. S. Pathania,           | Principles of Physical Chemistry   | Vishal Publishing Co, 4th edition edition | 2012. |
| 17. | J. N. Gurtu and A. Gurthu,                             | Advanced Physical Chemistry        | Pragathi Prakashan, Meerut, Revised,      | 2014  |

#### **REFERENCE BOOKS**

| <b>S.No</b> | <b>Authors</b>               | <b>Title</b>                          | <b>Publishers</b>                      | <b>Year of publication</b> |
|-------------|------------------------------|---------------------------------------|--|----------------------------|
| 1.          | S.Glasstone                  | Introduction To Electrochemistry      | Affiliated East West Press, New Delhi, | 1960                       |
| 2.          | J.O.M.Bokris and A.K.N.Reddy | Electrochemistry, Vols.1 and 2 Plenum | New York,                              | 1977                       |

#### **TEACHING METHODOLOGY:**

- PowerPoint presentation
- Group discussion
- Seminar and Assignments
- Animated videos
- Board and chalk

**SYLLABUS DESIGNERS:**

1. Dr.P.N.Sudha, Principal, Department of Chemistry
2. Dr.M.Nagarathinam, Head & Associate Professor, Department of Chemistry
3. Dr.S.Santha Lakshmi, Assistant Professor, Department of Chemistry
4. Dr.S.Sashikala, Assistant Professor, Department of Chemistry
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**ELECTIVE-PAPER-A: BIOINORGANIC CHEMISTRY AND SEPERATION TECHNIQUES**

| Semester | Subject Code | Category | Instruction Hours |              |          |              |           |              | Credits |
|----------|--------------|----------|-------------------|--------------|----------|--------------|-----------|--------------|---------|
|          |              |          | Lecture           |              | Theory   |              | Practical |              |         |
|          |              |          | Per Week          | Per Semester | Per Week | Per Semester | Per Week  | Per Semester |         |
| I        |              | Elective | 3                 | 45           | 3        | 45           | 0         | 0            | 3       |

**COURSE OBJECTIVES:**

- ❖ To have a knowledge about protein metallo biomolecules, role of metal ions in biological process, storage and transport of metal ions in biological system, chemical toxicology and uses of inorganic compounds as therapeutic agents.
- ❖ To learn about polymeric bio-organic molecules such as carbohydrates, proteins, nucleic acids, antibiotics, vitamins and to understand about various types of separation techniques for organic and biomolecules.

**COURSE OUTCOMES:**

- On the successful completion of course, students will be able to

| CO Number | CO statement   | Knowledge level |
|-----------|--|-----------------|
| CO1       | To identify the occurrence, active site structure and functions of some transition metal ion containing metalloproteins or enzymes | K2 & K3         |
| CO2       | Gain better knowledge about the structure of metallo enzymnes, importance of transport and storage metals in                       | K2 & K3         |

|            |   |                    |
|------------|---|--------------------|
|            | biological systems.   |                    |
| <b>CO3</b> | Acquire the skill of relating all the biomolecules in various biological systems and can gain knowledge about the biological importance of proteins, nucleic acids and carbohydrate | <b>K3 &amp; K4</b> |
| <b>CO4</b> | Gain clear knowledge about the chemistry and physiological action of antibiotics, vitamins and carotenoids  | <b>K3 &amp; K4</b> |
| <b>CO5</b> | To apply principles of separation and isolation techniques in organic reactions leading to the separation and purification of various products                                      | <b>K2 &amp; K3</b> |

\* CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

#### MAPPING WITH PROGRAM OUTCOMES

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | M          | M          | M          | S          | S          |
| <b>CO2</b> | M          | M          | S          | S          | S          | M          |
| <b>CO3</b> | M          | S          | S          | S          | M          | M          |
| <b>CO4</b> | M          | S          | S          | M          | M          | M          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

#### UNIT-I: METALLO PROTEINS

**9 hrs**

**Iron containing proteins:** Metalloporphyrins – Haemoglobin and myoglobin – Structures and work functions – synthetic oxygen carriers – Cytochrome – structure and work function. Non – heme oxygen carriers – Electron carrier proteins – Iron sulphur proteins – Ferridoxin and Rubredoxin – Magnesium containing proteins: Chlorophyll – structure – photosynthetic sequence – Copper containing proteins: Classification – blue copper proteins – structure of blue copper electron transferases – copper protein as oxidases – cytochrome c oxidase – mechanistic studies of cytochrome c oxidase

## UNIT II: METALLO ENZYMES

9 hrs

**Metalloenzymes:** Carboxy peptidase A – structure and function ; Carbonic anhydrase – inhibition and poisoning – Corrin ring system – Vitamin B<sub>12</sub> ( cyanocobalamin ) and B<sub>12</sub> coenzymes – *In vivo* and *In vitro* nitrogen fixation – nitrogen cycle.

**Essentials of trace elements and chemical toxicology:** Trace elements in biological system – sodium, potassium, calcium, zinc and copper – Metal ion toxicity - classes of toxic metal compounds – detoxification.

**Metals in medicine:** Antiarthritis drugs – Au and Cu in rheumatoid arthritis – Li in psychiatry – Pt, Au and metallocenes in anticancer drugs- metals in radiodiagnosis and magnetic resonance imaging.

**Transport and storage of metals:** Mechanism – Fe, Cu, Zn and V storage and transport – metallothioneins – Molecular mechanism of iron transport across the membrane – sodium and potassium ion pumps.

## UNIT-III: BIOMOLECULES

9 hrs

**Amino acids and Proteins:** Amino acids and Protein structure, peptides and their synthesis – (tripeptide using the amino acids glycine, alanine, lysine, cysteine, glutamic acid and arginine) – Analysis of N- terminal and C – terminals in a polypeptide. Sanger method, Edman degradation and Enzymatic analysis. Merrified synthesis – Primary, secondary and tertiary structure of proteins.

**Nucleic acids and Carbohydrates:** Chemistry of nucleic acids, nucleosides and nucleotides – Structure RNA and DNA and their biological importance – Pyranose and furanose forms of aldohexose and ketohexose – methods used for the determination of ring size – conformation of aldohexopyranose – structure and synthesis of lactose and sucrose. A brief study of starch and cellulose.

## UNIT-IV: ANTIBIOTICS, VITAMINS AND CAROTENOIDS

9 hrs

**Biomolecules: Antibiotics and vitamins:** A detailed study of structure, stereochemistry and synthesis of penicillin, cephalosporin – Chemistry and physiological action of ascorbic acid, thiamin, riboflavin and pyridoxine – Elementary aspect of vitamin A, E, K and B<sub>12</sub> - Synthesis of vitamin A<sub>1</sub> using Reformarsky method, Wittig reaction method, jansen method, Attenburrow method, Isler method – Synthesis of Vit- A<sub>2</sub> -Carotenoids – introduction – synthesis of  $\alpha$ -carotene,  $\beta$ -carotene,  $\gamma$ -carotene and lycopene.

## UNIT V: SEPARATION TECHNIQUES

9 hrs

Basic aspects of thin-layer chromatography (TLC), column chromatography and flash vacuum column chromatography – Principles, theory, instrumentation and

applications of Ion – exchange column Chromatography, Gel-permeation Chromatography, Gas chromatography and High Performance Liquid chromatography (HPLC) – Interpretation of chromatogram and separation of components from the mixture.

**Distribution of hours:** Theory-100%; Problems-Nil

### TEXT BOOKS

| S.No | Authors  | Title   | Publishers   | Year of publication |
|------|--|---|--|---------------------|
| 1.   | S. J. Lippard and J. M. Berg   | Principles of Bioinorganic Chemistry  | BergPanima Publishing Corporation                                      | 1997                |
| 2.   | W. Kaim and B. Schwederski   | Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life, (An Introduction and Guide), | John Wiley and Sons  | 1994                |
| 3.   | J. E. Huheey, E. A. Keiter and R. L. Keiter.                                   | Inorganic Chemistry, Principles of Structure and Reactivity                                       | Pearson Education  | 2004                |
| 4.   | F. A. Cotton and G. Wilkinson,   | Advanced Inorganic Chemistry  | Wiley Eastern  | 1998                |
| 5.   | <u>Geoffrey L. Zubay</u> , <u>William W. Parson</u> and <u>Dennis E. Vance</u> | Principles of Biochemistry  | McGraw-Hill Education  | 1995                |
| 6.   | <u>David L. Nelson</u> and <u>Michael M. Cox</u>                               | Principles of Biochemistry  | WH Freeman   | 2017                |
| 7.   | John McMurray  | Organic Chemistry   | International Edition 8 <sup>th</sup> Ed                               | 2017                |
| 8.   | I.L.Finar,   | Organic Chemistry Vol 2, Stereochemistry and the Chemistry of Natural Product                     | Dorling Kindersley India (P) Ltd                                       | 2009                |
| 9.   | B. S. Furniss, A. J. Hannaford, P. W. G. Smith and A. R. Tatchell,             | Vogel's text book of Practical Organic Chemistry  | Pearsons Education (Singapore) PTE Ltd, 3 <sup>rd</sup> Indian Reprint | 2005                |
| 10.  | Douglas A.   | Principles of   | CENAGE   | 2018                |



|    |  |   |  |      |
|----|--|---|--|------|
|    | Skoog, F. James<br>Holler and<br>Stanley R.<br>Crouch                            | Instrumental Analysis                           | Learning, 7 <sup>th</sup> Ed   |      |
| 11 | D. A. Skoog and<br>D. M. West  | Fundamentals of<br>Analytical Chemistry         | Holt<br>Rinehart and<br>Winston<br>Publications, 4 <sup>th</sup><br>Ed | 1982 |
| 12 | Douglas A.<br>Skoog, Donald<br>M. West, F.<br>James and<br>Stanley R.<br>Crouch, | Fundamentals of<br>Analytical Chemistry         | 8 <sup>th</sup> Ed   | 2004 |
| 13 | Lloyd R.<br>Snyder, Joseph<br>J. Kirkland and<br>John W. Dolan,                  | Introduction to Modern<br>Liquid Chromatography | Wiley 3 <sup>rd</sup> Ed   | 2009 |

#### REFERENCE BOOKS

| S.No | Authors             | Title   | Publishers                         | Year of publication |
|------|---------------------|---|------------------------------------|---------------------|
| 1.   | Gurdeep<br>Charwal, | Chemistry of natural<br>products  | Himalaya<br>publishing<br>house    | 2018                |
| 2.   | O.P. Agarwal,       | Chemistry of natural<br>products  | GOEL<br>Publishing<br>house        | 2015                |
| 3.   | I.L. Finar,         | Organic chemistry,<br>Stereochemistry and<br>chemistry of natural<br>products | Volume II,<br>Pearson<br>Education | 2002                |

#### TEACHING METHODOLOGY:

- PowerPoint presentation
- Group discussion
- Seminar and Assignments
- Animated videos
- Board and chalk

#### SYLLABUS DESIGNERS:

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### **ELECTIVE PAPER-B: DRUG DESIGN**

| Semester | Subject Code | Category | Instruction Hours |              |          |              |           |              | Credits |
|----------|--------------|----------|-------------------|--------------|----------|--------------|-----------|--------------|---------|
|          |              |          | Lecture           |              | Theory   |              | Practical |              |         |
|          |              |          | Per Week          | Per Semester | Per Week | Per Semester | Per Week  | Per Semester |         |
| I        |              | Elective | 3                 | 45           | 3        | 45           | 0         | 0            | 3       |

#### **COURSE OBJECTIVES:**

- ❖ To understand the concepts of drug design, drug metabolism, mechanism of drug –receptor binding and its structure activity relationship qualitatively and quantitatively.
- ❖ To enhance the knowledge in the various areas of molecular modelling, molecular docking and drug design techniques with detail concepts of all the mentioned areas.

#### **COURSE OUTCOME:**

- On completion of the course, the student should be able to:

| CO Number | CO statement   | Knowledge level |
|-----------|--|-----------------|
| CO1       | Learn about the ligands based on its electronic level using computational quantum chemistry  | K2, K3 & K4     |
| CO2       | Justify the role and importance of the various disciplines involved in the different phases of drug discovery and development, identification of global reactivity indicators of compounds using | K2, K3 & K4     |

|            |   |                        |
|------------|---|------------------------|
|            | computer methodologies and molecular modeling including artificial intelligence methods.  |                        |
| <b>CO3</b> | Get clear idea about the use of computational chemistry in structure based drug design, drug development as a process involving target selection, lead discovery using computer-based methods and computational chemistry/high-throughput screening.    | <b>K3 &amp; K4</b>     |
| <b>CO4</b> | Describe the safety evaluation, bioavailability, clinical trials, essentials used for drug development and also acquire knowledge about molecular recognition, computer aided drug design and toxicology as applied to the development of new medicines | <b>K2, K3 &amp; K4</b> |
| <b>CO5</b> | Get knowledge about molecular docking, simulation and dynamic in drug designing and development process.  | <b>K2, K3 &amp; K4</b> |

\*CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

#### **MAPPING WITH PROGRAM OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | M          | M          | M          |
| <b>CO2</b> | M          | S          | M          | M          | S          | M          |
| <b>CO3</b> | M          | S          | M          | S          | S          | M          |
| <b>CO4</b> | M          | S          | S          | S          | S          | M          |
| <b>CO5</b> | M          | M          | S          | S          | S          | S          |

#### **UNIT-I Electronic Structure methods**

**9 hrs**

Quantum chemical methods - semi-empirical and ab initio methods - Conformational analysis, energy minimization, comparison between global minimum conformation and bioactive conformation - Predicting the mechanism of organic reactions using electronic structure methods - Complete and constrained conformational search methods, their advantages and disadvantages - Theoretical aqueous solvation calculations for design of ligands - Conformational interconversion, transition-state determination and their role in designing rigid analogs.

## **UNIT-II Molecular modeling**

**9 hrs**

Molecular Mechanics, Quantum Mechanics, Energy minimization, geometry optimization, conformational analysis, global conformational minima determination - approaches and problems - Bioactive vs. Global minimum conformations - Automated methods of conformational search - Advantages and limitations of available software - Molecular graphics - Molecular properties, reactivity, HOMO, LUMO, Electrostatic potential - Solvent accessible surface - Computer methodologies behind molecular modeling including artificial intelligence methods.

## **UNIT-III DRUG DESIGN**

**9 hrs**

Drug design strategies-rational drug design: Inhibitors of ACE; structure based drug design: Anti HIV agents; ligand based approach - Design of agonist and antagonist:  $\beta$ 2-Agonists and the treatment of asthma - Discovery of the H<sub>2</sub>-receptor antagonist - Transition state analogues - Pro drug concept - prodrugs of ampicillin, enalapril and propranolol.

SAR: Qualitative versus quantitative approaches - advantages and disadvantages -Random screening - Non-random screening.

## **UNIT-IV QSAR AND DRUG METABOLISM**

**9 hrs**

QSAR - Electronic effects - Hammett equation - lipophilicity effects - Hansch equation, steric effects - Taft equation - Experimental and theoretical approaches for the determination of physico-chemical parameters - parameter inter-dependence.

Adsorption, distribution, metabolism and elimination - Methods of drug administration, drug solubility and lipophilicity, clogP, cell membrane permeability, blood brain barrier Lipinski's rule of five - Metabolism - first pass metabolism, chemical and metabolic stability- bioavailability and bioequivalence - concept of drug half life -therapeutic window.

## **UNIT – V Molecular docking and dynamics**

**9 hrs**

Rigid docking, flexible docking, manual docking - Advantages and disadvantages of Flex-X, Flex-S, Autodock and Dock softwares, with successful examples. Molecular dynamics: Dynamics of drugs, biomolecules, drug-receptor complexes, MonteCarlo simulations and Molecular dynamics in performing conformational search and docking - Estimation of free energy from dynamical methods

**Distribution of Marks:** Theory-80% and Problems-20%

**TEXT BOOKS**

| <b>S. No</b> | <b>Authors</b>               | <b>Title</b>                                   | <b>Publishers</b>                                 | <b>Year of publication</b> |
|--------------|------------------------------|--|---|----------------------------|
| 1.           | Burger                       | Medicinal Chemistry and Drug Discovery         | 5 <sup>th</sup> Edn                               | 1995                       |
| 2.           | R. B. Silverman              | Chemistry of Drug Design and Drug action       | Acad. press                                       | 2004                       |
| 3.           | Graham Patrick               | An Introduction to Medicinal Chemistry         | 2nd Edn. Qxford                                   | 2010                       |
| 4.           | N. K. Jain                   | Advances in Controlled and Novel Drug Delivery | CBS   | 2001                       |
| 5.           | Lednicer                     | The Organic Chemistry of Drug Synthesis        | Vol.1, 5 <sup>th</sup> Edition, John Wiley & Sons | 2001                       |
| 6.           | Foye's                       | Principles of Medicinal Chemistry,             | Sixth Edition, Wolters Kluwer                     | 2008                       |
| 7.           | G.R. Chatwal                 | Medicinal Chemistry                            | Himalaya Publishing House                         | 2007                       |
| 8.           | V.K. Ahluwalia and M. Chopra | Medicinal Chemistry                            | Ane Book Pvt. Ltd.                                | 2008                       |

**REFERENCE BOOKS**

| <b>S.No</b> | <b>Authors</b>       | <b>Title</b>                                     | <b>Publishers</b>     | <b>Year of publication</b> |
|-------------|----------------------|--|-----------------------|----------------------------|
| 1.          | R.B. Silverman       | Organic Chemistry of Drug Design and Drug Action | Academic Press        | 2012                       |
| 2.          | William H, Malick JB | Drug Discovery and Development                   | Humana Press Clifton. | 2004                       |

**TEACHING METHODOLOGY:**

- Board and chalk
- PowerPoint presentation
- Models
- Group discussion
- Seminar and Assignments
- Animated videos

**SYLLABUS DESIGNERS:**

1. Dr.P.N.Sudha, Principal, Department of Chemistry
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6. Dr. K. Vijayalakshmi, Assistant Professor, Department of Chemistry
7. Dr. T. Gomathi, Assistant Professor, Department of Chemistry
8. Mrs. J. Saranya, Assistant Professor, Department of Chemistry
9. Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

**ELECTIVE PAPER-C: GREEN CHEMISTRY**

| Semester | Subject Code | Category | Instruction Hours |              |          |              |           |              | Credits |
|----------|--------------|----------|-------------------|--------------|----------|--------------|-----------|--------------|---------|
|          |              |          | Lecture           |              | Theory   |              | Practical |              |         |
|          |              |          | Per Week          | Per Semester | Per Week | Per Semester | Per Week  | Per Semester |         |
| I        |              | Elective | 3                 | 45           | 3        | 45           | 0         | 0            | 3       |

**COURSE OBJECTIVES**

- ❖ To understand the green chemistry strategies for designing the chemical synthesis.
- ❖ To make the students knowledgeable about solvent - free synthesis, ultrasound and microwave assisted green synthesis

**COURSE OUTCOME**

- On completion of the course, the student should be able to:

| CO Number | CO statement  | Knowledge level |
|-----------|---|-----------------|
| CO1       | Gain knowledge about the basic principles and designing of safer chemicals to produce biodegradable products          | K2 & K3         |
| CO2       | Get clear idea about the solvent - free green synthesis, ultrasound and microwave assisted green synthesis            | K3 & K4         |
| CO3       | Understand polymer supported catalytic reactions and ionic liquids as green solvents in synthesizing various products | K3 & K4         |
| CO4       | Acquire knowledge about the phase transfer catalysis in green synthesis   | K2 & K3         |
| CO5       | Gain clear knowledge about industrial case studies such as reverse tanning, vegetable tanning and chrome tanning      | K3 & K4         |

\* CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

### MAPPING WITH PROGRAM OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | M   | M   | M   |
| CO2 | S   | S   | M   | M   | S   | M   |
| CO3 | M   | S   | S   | M   | S   | M   |
| CO4 | M   | S   | S   | M   | S   | M   |
| CO5 | M   | M   | S   | S   | S   | S   |

### UNIT- I: BASIC PRINCIPLES OF GREEN CHEMISTRY

9 hrs

Basic principles - prevention of waste/by-products, maximum incorporation of the reactants (starting materials and reagents) into the final product, prevention or minimization of hazardous products, designing safer chemicals, energy requirements for synthesis, selection of appropriate solvent, selection of starting materials, use of protecting groups, use of catalyst and products designed should be biodegradable.

### UNIT- II: ULTRASOUND AND MICROWAVE ASSISTED GREEN SYNTHESIS

9 hrs

Ultrasound: Introduction, instrumentation, the phenomenon of cavitation - Sonochemical esterification, substitution, addition, alkylation, oxidation, reduction and coupling reactions - Microwaves: Introduction, concept, reaction vessel/ medium, specific effects, atom efficiency (% atom utilization), advantages and limitations - N-alkylation and alkylation of active methylene compounds and Diels –Alder reactions. Reactions in water and reaction in organic solvents - Solvent - free reactions and deprotection of esters.

### UNIT- III: IONIC-LIQUIDS AS GREEN SOLVENTS

9 hrs

Introduction - structure, synthesis and applications of some important ionic liquids in organic synthesis - Polymer supported reagents in green synthesis - Introduction - properties and advantages of polymer supported reagents and choice of polymers - Substrate covalently bound to the support - Synthesis of oligosaccharides - intramolecular cyclisation - Selective chemical reactions on one aldehyde group of symmetrical aldehydes - Asymmetric synthesis - Reagent linked to a polymeric material - Preparation of sulfonazide polymer and application in diazotransfer reaction - Synthesis of polymer bound per acid and its applications - synthesis of polystyrene tin dichloride resin and its applications - Polymer supported catalytic reactions - Preparation of polymer supported  $\text{AlCl}_3$  and applications - polymer supported photosensitizers.

**UNIT- IV: PHASE TRANSFER CATALYSIS IN GREEN SYNTHESIS****9 hrs**

Introduction - mechanism of phase transfer catalyst reaction - types and advantages of phase transfer catalyst - types and applications of phase transfer reaction - Nitriles from alkyl or acyl halides, alkyl fluorides, alcohols, azides from alkyl halides - generation of dichlorocarbenes - addition to olefins - elimination reaction - alkylation reactions - Williamson synthesis - Benzoin condensation - Darzen reaction - Michael reaction - Wittig reaction - oxidation under PTC condition and reduction.

**UNIT-V: INDUSTRIAL CASE STUDIES****9 hrs**

Methyl Methacrylate (MMA) - Greening of Acetic acid manufacture - Vitamin-C - Leather manufacture -Types of Leather- Difference between Hide and Skin - Tanning – Reverse tanning -Vegetable tanning - Chrome tanning - Fat liquoring – Dyeing – Application - Polyethylene-Ziegler Natta Catalysis - Metallocene Catalysis - Ecofriendly Pesticides and Insecticides.

**Distribution of marks :** Theory -100%

**TEXT BOOKS**

| <b>S.No</b> | <b>Authors</b>                               | <b>Title</b>                                  | <b>Publishers</b>                        | <b>Year of publication</b> |
|-------------|--|---|--|----------------------------|
| <b>1.</b>   | V.K.Ahluwalia and M. Kidwai                  | New Trends in Green Chemistry                 | II Edn.,<br>Anamaya publishers New Delhi | 2007                       |
| <b>2.</b>   | Mike Lancaster                               | Green Chemistry and Introductory text         | II Edition                               | 2002                       |
| <b>3.</b>   | V. K. Ahluwalia and R. Aggarwal, Narosa      | Organic Synthesis, Special Techniques         | New Delhi                                | 2003                       |
| <b>4.</b>   | Mike Lancaster                               | Green Chemistry – an introduction text        | Royal Society of Chemistry, UK           | 2002                       |
| <b>5.</b>   | W. B. Weber, G. W. Gokel, Springer, Berlin,. | Phase Transfer Catalysis in Organic Synthesis | Springer                                 | 1977                       |



**REFERENCES BOOKS**

| S.No | Authors                                       | Title   | Publishers                                   | Year of publication |
|------|---|---|--|---------------------|
| 1.   | R. Sanghi and M. Srivastava                   | Green Chemistry - Environment Friendly Alternatives | New Delhi                                    | 2003                |
| 2.   | P. T. Anastas and J. C. Warner                | Green Chemistry - Theory and Practice               | Oxford University press. Oxford              | 1988                |
| 3.   | N. K. Mathur, C. K. Narang and R. E. Williams | Polymers as Aids in Organic Synthesis               | Academic Press, NY                           | 1980                |
| 4.   | E. V. Dehmlov, S. S. Dehmlov                  | Phase Transfer Catalysis                            | 2 <sup>nd</sup> Edn., Verlagchemie, Wienhein | 1983                |

**TEACHING METHODOLOGY:**

- Board and chalk
- PowerPoint presentation
- Models
- Group discussion
- Seminar and Assignments
- Animated videos

**SYLLABUS DESIGNERS:**

1. Dr.P.N.Sudha, Principal, Department of Chemistry
2. Dr.M.Nagarathinam, Head & Associate Professor, Department of Chemistry
3. Dr.S.Santha Lakshmi, Assistant Professor, Department of Chemistry
- 4.Dr.S.Sashikala, Assistant Professor, Department of Chemistry
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## SELF STUDY PAPER (OPTIONAL)

### ENVIRONMENTAL CHEMISTRY FOR A SUSTAINABLE WORLD

| Semester | Subject Code | Category                    | Instruction Hours |              |          |              |           |              | Credits |
|----------|--------------|-----------------------------|-------------------|--------------|----------|--------------|-----------|--------------|---------|
|          |              |                             | Lecture           |              | Theory   |              | Practical |              |         |
|          |              |                             | Per Week          | Per Semester | Per Week | Per Semester | Per Week  | Per Semester |         |
| I        |              | Self study Paper (Optional) | -                 | -            | -        | -            | -         | -            | 2*      |

### COURSE OBJECTIVES

- To provide an insight into the chemical reactions and to apply the principles in analysing pollution in water, air and soil environment.
- To provide an understanding on the fate of chemicals on the environment and suggest relevant interventions.

### COURSE OUTCOMES

➤ On the successful completion of course, students will be able to

| CO Number | CO statement   | Knowledge level |
|-----------|--|-----------------|
| CO1       | Gain the knowledge on atmosphere of earth, global warming and greenhouse gases                         | K1 & K2         |
| CO2       | Gain the knowledge on contaminants, their natural pathways of degradation and their abatement          | K2 & K3         |
| CO3       | Acquire knowledge about the various physicochemical parameters which affect the environment            | K3              |
| CO4       | Have a better understanding of soil and water quality parameters by analysing the contaminated samples | K2 & K4         |
| CO5       | Gain knowledge on the various industrial wastewater treatment methods                                  | K3 & K4         |

\*CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

### MAPPING WITH PROGRAM OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | M   | S   | M   | M   | M   | M   |
| CO2 | M   | S   | M   | M   | M   | M   |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO3</b> | M | S | M | M | M | S |
| <b>CO4</b> | M | S | M | M | M | S |
| <b>CO5</b> | M | S | M | M | M | S |

#### **UNIT – I : ATMOSPHERIC CHEMISTRY**

The atmosphere of Earth-Contaminant behavior in the environment-Green house effect - Global Warming -Acid rain and - Ozone layer depletion.

Fundamental concepts in chemistry – Elements and compounds – Atomic structure – Formation of molecules – Solutions: normality, molality and molarity – Ionization – radicals – Expressing concentrations.

#### **UNIT II: CONTAMINANTS AND THEIR NATURAL PATHWAYS OF DEGRADATION AND THEIR ABATEMENT**

Carbon Cycle, Nitrogen Cycle, Sulphur Cycle, CO formation in atmosphere, Organic Pollutants, Pollution from Combustion Systems, Coal, Combustion, Photochemical Smog and Indoor Air Pollution

#### **UNIT- III: PHYSICOCHEMICAL PARAMETERS**

pH – Electrical conductivity – Total solids – Total suspended solids – Dissolved oxygen – Carbonates – bicarbonates – Hardness – Calcium – Magnesium – Total alkalinity – Fluoride – Iron – Nitrate – Nitrite –Phosphate Biochemical Oxygen Demand (BOD) – Chemical Oxygen Demand (COD). Biological Parameters: Macrophytes – Phytoplankton – Zooplankton – Primary Productivity. Bacteriological measurements- Standard Plate count method – MPN (Most Probable number)

#### **UNIT-IV: SOIL AND WATER ANALYSIS**

Nature of soil – Soil macro and micronutrients – Soil structure and texture – Soil water – Soil air – Soil Temperature – Soil organic matter .Water - Characteristics of bodies of water-Properties of water – Hydrogen Bonding – covalent bonding – ionic bonding –Water sampling: Sampling stations-Collection of water samples – Handling and Preservation. Water analysis: Physical parameters: Colour – Temperature – Transparency – Turbidity.

#### **UNIT - V: INDUSTRIAL CHEMISTRY**

Classification of Industries Based on Environmental Impacts, Criteria for Selection of Site for Establishment of Industry, Socio-economic and Environmental Impacts of Industries, Legal and Statutory Requirements, Manufacturing Process and the Sources of Wastes, Characterization & Treatment of Industrial Waste with respect to Paper and Pulp, Tannery, Textile, Dairy, Sugar, Petrochemical, Pharmaceutical, Oil Refinery and Power Plants-Thermal, Gas Based and Hydroelectric.

**Distribution of Marks:** Theory-90% and Problems-10%

**TEXT BOOKS**

| S.No | Authors   | Title   | Publishers                           | Year of publication |
|------|---|---|--------------------------------------|---------------------|
| 1.   | Manahan, Stanley E.                                       | Fundamentals of Environmental Chemistry             | Boca Raton, CRC Press, LLC           | 2001                |
| 2.   | Sonja Krause, Herbert M. Clark, James P. Ferris, Robert L | Strong Chemistry of the Environment                 | Elsevier Science & Technology        | 2002                |
| 3.   | Eugene R. Weiner 2000 CRC Press, LLC                      | Applications of Environmental Chemistry             | CRC Press, LLC                       | 2000                |
| 4.   | Clair N.Sawyer, Perry L. McCarty, Gene F.Parkin,          | Chemistry for environmental engineering and science | McGraw Hill, 5 <sup>th</sup> Edition | 2002                |

**SYLLABUS DESIGNERS:**

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9. Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

#### PAPER-IV: COORDINATION CHEMISTRY

| Semest<br>er | Subje<br>ct<br>Code | Catego<br>ry | Instruction Hours |                     |                 |                     |                 |                     | Credi<br>ts |
|--------------|---------------------|--------------|-------------------|---------------------|-----------------|---------------------|-----------------|---------------------|-------------|
|              |                     |              | Lecture           |                     | Theory          |                     | Practic<br>al   |                     |             |
|              |                     |              | Per<br>Wee<br>k   | Per<br>Semest<br>er | Per<br>Wee<br>k | Per<br>Semest<br>er | Per<br>Wee<br>k | Per<br>Semest<br>er |             |
| II           |                     | Core         | 3                 | 45                  | 3               | 45                  | 0               | 0                   | 3           |

#### **COURSE OBJECTIVES:**

- To learn about thermodynamic and stereochemical aspects of complex formation, various theories of complexes, magnetic properties, term symbols and energy level diagram of weak and strong field ligands, charge transfer spectra and spectral properties of lanthanides and actinides.
- To learn about various mechanisms of substitution and electron transfer reactions and to study the recent development in the catalysis

#### **COURSE OUTCOMES:**

➤ On the successful completion of course, students will be able to

| CO Number  | CO statement   | Knowledge level    |
|------------|--|--------------------|
| <b>CO1</b> | Get better understanding of stability constant, types of macrocyclic ligands and nomenclature of chiral complexes  | <b>K2 &amp; K4</b> |
| <b>CO2</b> | Identify the principles, structure and reactivity of selected coordination complexes with the help of crystal field theory and molecular orbital theory                              | <b>K2 &amp; K3</b> |
| <b>CO3</b> | Interpret their electronic spectra, magnetic properties and can gain knowledge about the distortion in co-ordination complexes concept of sigma and pi bonding in complexes          | <b>K2 &amp; K4</b> |
| <b>CO4</b> | Get clear knowledge about the ISM, OSM, reaction mechanism of coordination compounds and the application of substitution reactions in the synthesis of Platinum and Cobalt complexes | <b>K3 &amp; K4</b> |
| <b>CO5</b> | Identify the bonding aspects of simple organometallic compounds, different types of organometallic reactions and to explain different catalytic reactions                            | <b>K2 &amp; K3</b> |

\* CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

## MAPPING WITH PROGRAM OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | M   | M   | M   | M   | S   | S   |
| CO2 | M   | M   | S   | S   | S   | M   |
| CO3 | S   | S   | S   | S   | S   | S   |
| CO4 | M   | S   | S   | M   | M   | M   |
| CO5 | M   | S   | S   | S   | M   | M   |

### UNIT-I: STABILITY OF COMPLEXES

9 hrs

Stability of complexes – Factors affecting stability of complexes – Thermodynamic aspects of complex formation – Stepwise and overall formation constants – Stability correlations – statistical factors and chelate effect – Determination of stability constant and composition of the complexes – Formation curves and Bjerrum's half method – Potentiometric method – Spectrophotometric method – Ion exchange method – Polorographic method and Continuous variation method (Job's method)

Stereochemical aspects – Stereoisomerism in inorganic complexes – Isomerism arising out of ligand distribution and ligand conformation – Chirality and nomenclature of chiral complexes; Application of ORD and CD in the identification of complexes. Macrocyclic ligands – Porphyrins, Corrins, Schiff's bases and crown ethers.

### UNIT-II: METAL – LIGAND BONDING

9 hrs

Crystal field theory – Splitting of d – orbitals under various geometries – factors affecting splitting, CFSE, evidences for CFSE (Structural and thermodynamic effects), spectrochemical series – Jorgensen relation – site preferences – Jahn Teller distortion – Dynamic and Static J.T. effect – Application of CFT – Magnetic properties – spectral properties and Kinetic properties – Limitations of CFT – Evidences for Metal – Ligand overlap.

MOT – MO theory and energy level diagrams concept of Weak and strong fields – Sigma and pi bonding in octahedral, square planar and tetrahedral complexes – Nephelauxetic effect – Magnetic properties of complexes – Comparison of CFT and MOT of bonding in octahedral complexes.

### UNIT-III: ELECTRONIC SPECTRA OF COMPLEXES

9 hrs

Spectroscopic term symbols for  $d^n$  ions – derivation of term symbols and ground state term symbol – Hund's rule – Selection rules – breakdown of selection rules – spin orbit coupling, band intensities, weak and strong field limits – correlation diagram – Energy level diagrams – Orgel diagram for weak field Oh and Td complexes – Splitting of energy level due to Jahn-Teller distortion – Modified Orgel diagram – Limitations of Orgel diagram Tanabe-Sugano (T-S) diagrams – Evaluation of  $Dq$  and  $B$  values for  $d^2$  –  $d^8$  complexes – charge transfer – spectra – Complications in band classification

between Lf(d-d) and CT bands – Comparison between d-d bands and CT bands – Numerical problems – Lanthanides and Actinides – Spectral properties-Lanthanide contraction.

#### **UNIT IV: ELECTRON TRANSFER REACTIONS**

**9 hrs**

Electron transfer reactions – Potential energy well diagram – Inner sphere (ISET) and outer sphere (OSET) electron transfer processes – Differences between ISM and OSM – Role of bridging ligand with ISET reaction – formation and rearrangement of precursor complexes – Nature of bridging ligand – fission of successor complexes – Complementary and non complementary ET reactions – Cross reactions and Marcus Hush theory.

Reaction mechanism of coordination compounds – Types of ligand substitution reactions – mechanism; Dissociative mechanism (D), Associative mechanism (A) and interchange mechanism (I).

#### **UNIT-V: SUBSTITUTION REACTIONS**

**9 hrs**

Labile and Inert complexes – Substitution Reaction in octahedral complexes – replacement of coordinated water, mechanism of acid hydrolysis, base hydrolysis – DCB mechanism – direct and indirect evidences in favour of the mechanism – Ligand substitution reactions without cleavage of M-L Bond – Anation Reactions – Substitution in square planar complexes – General mechanism, Trans effect – influences of entering, leaving and other groups. Application of trans effect – synthesis of isomers of Pt(II) complexes – theories of trans effect and cis-trans isomerisation reaction – Application of substitution reactions in the synthesis of Platinum and Cobalt complexes.

**Distribution of hours:** Theory-70%; Problems-30%

#### **TEXT BOOKS**

| <b>S.No</b> | <b>Authors</b>                              | <b>Title</b>  | <b>Publishers</b>                     | <b>Year of publication</b> |
|-------------|---|---|---------------------------------------|----------------------------|
| 1.          | H. J. Emelius and Sharpe                    | Modern aspects of Inorganic chemistry                       | Universal book stall, New Delhi       | 1989                       |
| 2.          | F. Basolo and R.G. Pearson                  | Mechanism of Inorganic reactions                            | Wiley Eastern                         | 1967                       |
| 3.          | J. E. Huheey, E. A. Keiter and R. L. Keiter | Inorganic chemistry- Principles on structure and reactivity | 4 <sup>th</sup> Ed, Pearson-education | 2002                       |
| 4.          | F. A. Cotton and G. Wilkinson               | Advanced Inorganic Chemistry                                | Wiley Eastern                         | 1988                       |

|     |  |   |                          |      |
|-----|--|---|--------------------------|------|
| 5.  | S. F. A. Kettle                                | Co-ordination compounds                       | ELBS                     | 1973 |
| 6.  | K. F. Purcell and J. C. Kotz                   | Inorganic Chemistry                           | WB Sanders Co, USA,      | 1977 |
| 7.  | D. F. Shriver, P. W. Atkins and C. H. Longford | Inorganic Chemistry                           | ELBS, 2 <sup>nd</sup> Ed | 1994 |
| 8.  | R. B. Heslop and K. Jones                      | Inorganic Chemistry                           | Elsevier                 | 1976 |
| 9.  | D. Bannerjea                                   | Co-ordination Chemistry                       | TATA Mcgraw Hill         | 1993 |
| 10. | M. L. Tobe                                     | Inorganic Reaction Mechanism                  | Nelson                   | 1972 |
| 11  | K.Burjer                                       | Co-ordination Chemistry Experimental Methods, | Butterworths             | 1973 |
| 12  | B.N.Figgis,                                    | Introduction to Ligand Fields                 | Wiley Eastern Ltd,       | 1976 |
| 13  | W.E.Addison                                    | Structural Principles of Inorganic Chemistry  | Longman                  | 1961 |

#### **REFERENCE BOOKS**

| <b>S.No</b> | <b>Authors</b>             | <b>Title</b>           | <b>Publishers</b>    | <b>Year of publication</b> |
|-------------|----------------------------|------------------------|----------------------|----------------------------|
| <b>1.</b>   | S.F.A. Kettle              | Coordination Chemistry | EIBS                 | 1973                       |
| <b>2.</b>   | K. Burger                  | Coordination Chemistry | Burter Worthy        | 1973                       |
| <b>3.</b>   | K.F. Purcell and J.C. Kotz | Inorganic Chemistry    | WB Saunders Co., USA | 1977                       |

#### **TEACHING METHODOLOGY:**

- PowerPoint presentation
- Models
- Group discussion
- Seminar and Assignments
- Animated videos
- Board and chalk

#### **SYLLABUS DESIGNERS:**

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#### **PAPER-V: ORGANIC REACTION MECHANISMS AND REARRANGEMENTS**

| Semester | Subject Code | Category | Instruction Hours |              |          |              |           |              | Credits |
|----------|--------------|----------|-------------------|--------------|----------|--------------|-----------|--------------|---------|
|          |              |          | Lecture           |              | Theory   |              | Practical |              |         |
|          |              |          | Per Week          | Per Semester | Per Week | Per Semester | Per Week  | Per Semester |         |
| II       |              | Core     | 3                 | 45           | 3        | 45           | 0         | 0            | 3       |

#### **COURSE OBJECTIVES:**

- ❖ Understanding addition, elimination, rearrangement and naming reactions along with their mechanism and synthetic utility.
- ❖ Understanding various types of oxidation and reduction reactions along with their mechanism and synthetic utility.

#### **COURSE OUTCOMES:**

On the successful completion of course, students will be able to

| CO Number | CO statement   | Knowledge level    |
|-----------|--|--------------------|
| CO1       | Get a clear picture about the addition reactions happening through nucleophilic, electrophilic groups and to learn about the addition reactions between double bonded carbon compounds   | <b>K2 &amp; K3</b> |
| CO2       | Gain knowledge on the nucleophilic and electrophilic additions to carbonyl compounds and naming reactions  | <b>K2 &amp; K3</b> |
| CO3       | Obtain an outline about elimination reactions and the rules used to study elimination reactions with some specific examples  | <b>K3</b>          |
| CO4       | Acquire knowledge about the reagents which causes various rearrangement reactions  | <b>K2 &amp; K3</b> |
| CO5       | Learn about the basic mechanism of oxidation in various organic compounds such as alcohols, aldehydes, ketones, olefins etc and two types of reduction reactions like complete reduction and selective reduction using different reducing agents | <b>K2 &amp; K4</b> |

\* CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

### MAPPING WITH PROGRAM OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | M   | M   | M   | M   | S   | S   |
| CO2 | M   | M   | S   | S   | S   | M   |
| CO3 | M   | M   | M   | M   | S   | M   |
| CO4 | M   | S   | S   | S   | S   | M   |
| CO5 | M   | S   | S   | S   | M   | S   |

#### UNIT-I: ADDITION TO CARBON-CARBON DOUBLE BOND

9 hrs

Electrophilic addition to carbon – carbon double and triple bonds – Nucleophilic addition to carbon–carbon multiple bonds – Generation and addition of carbenes– Michael addition and Robinson annulation.

Hydroxylation of olefinic double bonds ( $\text{OsO}_4$ ,  $\text{KMnO}_4$ ); Woodward and Prevost oxidation – Epoxidation using peracids including Sharpless epoxidation – Ozonolysis. Hydrogenation (homogenous and heterogeneous) and Transfer hydrogenation – Hydroboration – Hydration of carbon-carbon double and triple bonds.

#### UNIT-II: ADDITION TO CARBON-OXYGEN DOUBLE BOND

9 hrs

Nucleophilic addition to  $\text{C}=\text{O}$  bond – A study of Mannich, benzoin, Darzen's glycidic ester, Stobbe and Knoevenagel condensation reactions – Wittig, Wittig-Horner olefination reactions; Sulfur and Sulfonium ylides and their reactions – Julia olefination and Peterson alkene synthesis – Asymmetric reduction of carbonyl functions (Corey's procedure).

#### UNIT-III: ELIMINATION

9 hrs

Elimination reactions:  $\text{E}_1$ ,  $\text{E}_2$ ,  $\text{E}_{1\text{cb}}$  and  $\text{E}_{\text{i}}$ -elimination – Conformation of mechanism; solvent, substrate, leaving group effects – Typical elimination reactions – dehydration, dehydrohalogenation and dehalogenation – Saytzeff's Vs Hoffmann elimination; Stereochemistry of  $\text{E}_2$  eliminations – Elimination in cyclohexane ring system; Mechanism of pyrolytic eliminations – Examples: Chugaev reactions and Cope elimination – Hoffmann degradation and pyrolysis of esters.

#### UNIT-IV: MOLECULAR REARRANGMENTS AND REACTIONS

9 hrs

A study of mechanism of the following rearrangements: Beckmann, Curtius, Hofmann, Schmidt, Lossen, Wolff, Pinacol, Wagner – Meerwin, Demjanov, Dienone – Phenol, Favorski, Benzidine, Claisen, Cope, Sommelet – Hauser, Pummerer, Baeyer – Villiger, Wolf, Stevens and Von – Richter rearrangements.

A study of the following name reactions: Dieckmann cyclization, Hofmann – Löffler Freytag reaction, Mitsunobu reaction, Shapiro reaction, Eschenmoser – Tanabe and Ramburg – Backlund reactions.

#### **UNIT-V: OXIDATION AND REDUCTION REACTIONS**

**9 hrs**

Oxidation of methylene to carbonyl, oxidation of aryl methenes – allylic oxidation of olefins – Oxidation with Cr (including PCC, PDC, Jones) and Mn (including  $\text{MnO}_2$  and  $\text{BaMnO}_4$ ) reagents; Oxidation with LTA, DDQ,  $\text{Hg}(\text{OAc})_2$  and  $\text{SeO}_2$ ; Oxidation using DMSO either with DCC or  $\text{Ac}_2\text{O}$  or Oxaloyl chloride; Oxidation using IBX and Dess-Martin Periodinane (DMP) reagent.

Clemmenson and Wolf-Kishner reduction – Huang Millon modification – Birch reduction and MPV reduction. Reduction with sodium borohydride, lithium aluminium hydride, tritertiarybutoxyaluminium hydride, sodium Cyanoborohydride,  $\text{Zn}(\text{BH}_4)_2$ , DIBAL-H, Red-Al,  $\text{Et}_3\text{SiH}$  and  $\text{Bu}_3\text{SnH}$ . Selectrides – Selectivity in reduction 4-t-butylcyclohexanone using selected hydride reductions.

**Distribution of hours:** Theory-90%; Problems-10%

#### **TEXT BOOKS**

| <b>S.No</b> | <b>Authors</b>                       | <b>Title</b>                            | <b>Publishers</b>                           | <b>Year of publication</b> |
|-------------|--------------------------------------|---|---|----------------------------|
| 1           | Jerry March                          | Advanced Organic Chemistry              | John Wiley & Sons, 5 <sup>th</sup> Ed       | 2001                       |
| 2           | F. Carey and R. J. Sundberg          | Advanced Organic Chemistry-Part A and B | Springer Science 5 <sup>th</sup> Ed         | 2007                       |
| 3           | M. B. Smith and Jerry March          | Advanced Organic Chemistry              | John Wiley & Sons, 5 <sup>th</sup> Ed       | 2001                       |
| 4           | J. Clayden, N. Greeves and S. Warren | Organic Chemistry,                      | Oxford University Press, 2 <sup>nd</sup> Ed | 2012.                      |
| 5           | M. B. Smith                          | Organic Synthesis,                      | Academic Press 3 <sup>rd</sup> Ed           | 2011                       |
| 6           | R. O. C. Norman and J. M. Coxon,     | Principles of Organic Synthesis         | Chapman & Hall, 3 <sup>rd</sup> Ed          | 1993                       |
| 7           | Stuart Warren                        | Organic Synthesis                       | Disconnection Approach, Wiley India (P) Ltd | 2007                       |

|   |               |                                 |                               |      |
|---|---------------|---------------------------------|-------------------------------|------|
| 8 | V.K.Ahluwalia | Oxidation in Organic synthesis  | CRC Press, 1 <sup>st</sup> Ed | 2012 |
| 9 | V.K.Ahluwalia | ,Reduction in Organic Synthesis | CRC Press, 1 <sup>st</sup> Ed | 2012 |

**TEACHING METHODOLOGY:**

- PowerPoint presentation
- Models
- Group discussion
- Seminar and Assignments
- Animated videos
- Board and chalk

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9. Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

**PAPER-VI: QUANTUM CHEMISTRY AND ANALYTICAL TECHNIQUES**

| Semest<br>er | Subje<br>ct<br>Code | Catego<br>ry | Instruction Hours |                     |                 |                     |                 |                     | Credi<br>ts |
|--------------|---------------------|--------------|-------------------|---------------------|-----------------|---------------------|-----------------|---------------------|-------------|
|              |                     |              | Lecture           |                     | Theory          |                     | Practic<br>al   |                     |             |
|              |                     |              | Per<br>Wee<br>k   | Per<br>Semest<br>er | Per<br>Wee<br>k | Per<br>Semest<br>er | Per<br>Wee<br>k | Per<br>Semest<br>er |             |
| II           |                     | Core         | 4                 | 60                  | 4               | 60                  | 0               | 0                   | 4           |

**COURSE OBJECTIVES**

- ❖ To learn the principles of quantum mechanics of simple systems, quantum mechanical treatment of multi electron atoms.
- ❖ To learn the principles, instrumentation, interpretation and applications of micro wave, IR, Raman spectroscopy, Polarography, Amperometry, Coulometry, various thermal analysis, various elemental analysis and surface analysis techniques

**COURSE OUTCOMES:**

➤ On the successful completion of course, students will be able to

| <b>CO Number</b> | <b>CO statement</b>   | <b>Knowledge level</b> |
|------------------|---|------------------------|
| CO1              | Revise and update the mathematical concepts of vectors and tensors to chemical systems by solving eigenvalue and eigenvector problems in matrices and first and second order differential equations that are used for solving the time independent Schrodinger equation, particle in a potential-free box, particle on a ring, harmonic oscillator and particle in a Coulomb potential exactly and demonstrate the solutions for hydrogen atom and molecular rotations and vibrations | <b>K2 &amp; K3</b>     |
| CO2              | Calculate the energy of simple multi-electron atoms and molecules, solve all the model problems in quantum mechanics for which exact analytical methods and solutions are available and will apply them to analyze the basis behind the postulatory method of quantum mechanics   | <b>K3 &amp; K2</b>     |
| CO3              | Gain knowledge about the basic principles of rotational and vibrational spectroscopic techniques in different researches  | <b>K3 &amp; K4</b>     |
| CO4              | Acquire knowledge about the basic principles of various electroanalytical techniques such as polarography, amperometry and to study the importance of potentiometric, conductometric and complexometric titration   | <b>K2 &amp; K4</b>     |
| CO5              | Get better understanding of principles, instrumentation and applications of various elemental analysis, surface analysis techniques which will be employed in current research nano projects  | <b>K2 &amp; K3</b>     |

\* CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

**MAPPING WITH PROGRAM OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | M          | M          | M          | S          | S          |
| <b>CO2</b> | M          | M          | S          | S          | S          | M          |
| <b>CO3</b> | M          | M          | M          | M          | S          | M          |
| <b>CO4</b> | M          | S          | S          | S          | S          | M          |
| <b>CO5</b> | M          | S          | S          | S          | M          | S          |

**UNIT-I: QUANTUM CHEMISTRY-I****12 hrs**

Black body radiation – Planck's quantum theory – Wave particle duality – Uncertainty Principle. Operators-linear, commutation, Hermitian and Hamiltonian operators – Eigen functions and Eigen values-Postulates of quantum mechanics – Derivation of Schrodinger's time-independent wave equation and its application to particle in a one dimensional box – particle in a three dimensional box, harmonic oscillator, rigid rotor and hydrogen atom.

**UNIT-II: QUANTUM CHEMISTRY-II****12 hrs**

Born-Oppenheimer approximation-Hydrogen molecule ion – LCAO-MO and VB treatments of the hydrogen molecule – Antisymmetry and Pauli's exclusion principle. Slater determinant wave function, term symbols and spectroscopic states – Russell Saunders coupling.

The variation theorem and Perturbation theory. Applications of variation method and perturbation theory to helium atom. Hybridization – determination of bond angles of  $sp$ ,  $sp^2$  and  $sp^3$  hybridizations – Huckel pi electron (HMO) theory and its applications to ethylene, butadiene and benzene – A brief idea of Hartree and Hartree-Fock self consistent field theory.

**UNIT III: ROTATIONAL AND VIBRATIONAL SPECTROSCOPY****12 hrs**

Microwave spectroscopy – Theory – selection rules – Instrumentation; Energy levels in atoms and molecules – Fourier transformation Rotational spectra of diatomic and polyatomic molecules – P,Q,R branches – effect of isotopic substitution. Non – rigid rotator – Linear molecules. Theory of Rotational Raman spectra.

Vibrational spectra of diatomic molecules – selection rules – overtones, combination and hot bands - Fermi resonance Energy of diatomic molecule – simple harmonic and unharmonic oscillator, rotational character of vibration spectra – Theory of Vibrational Raman spectroscopy-Coherent – Antistokes Raman Spectroscopy (CARS).

**UNIT-IV: SPECTRO AND ELECTROANALYTICAL TECHNIQUES****12 hrs**

X-ray Photoelectron Spectroscopy (XPS), Atomic absorption Spectroscopy (AAS), Atomic emission spectroscopy (AES) – Principles, theory, instrumentation and applications – interpretation of spectra – Merits and demerits – Coloumetry – Polarography – theory, apparatus, DME – Diffusion, Kinetic and catalytic currents – Current – voltage curves for reversible and irreversible system – qualitative and quantitative applications to inorganic system.

Amperometric titrations – theory, apparatus, types of titration curves, successive titration and indicator electrodes – Applications. Cyclic voltametry – theory,

application to inorganic systems. Potentiometric, conductometric and complexometric titrations – Masking and demasking agents

## **UNIT V: SURFACE AND THERMAL ANALYSIS TECHNIQUES**

**12 hrs**

Principles, theory, instrumentation and applications of Scanning Electron Microscopy (SEM), Scanning Tunneling Microscopy (STM), Transmission Electron Microscopy (TEM), Energy Dispersive X-ray Analysis (EDAX), Atomic Force Microscopy (AFM), Electron Spectroscopy for Chemical Analysis (ESCA)– interpretation of spectra – Merits and demerits.

Principles, theory and applications of Thermo Gravimetric Analysis, DTA, DSC, DTG. Interpretation of various thermal analysis curves.

**Distribution of hours: Theory-70%; Problems-30%**

### **TEXT BOOKS**

| <b>S.No</b> | <b>Authors</b>                       | <b>Title</b>                           | <b>Publishers</b>                               | <b>Year of publication</b> |
|-------------|--------------------------------------|--|---|----------------------------|
| 1           | P. W. Atkins                         | Molecular Quantum Mechanics            | Oxford University Press, Oxford                 | 1983                       |
| 2           | M. W. Hanna,                         | Mechanics in Quantum Chemistry         | W. A Benjamin Inc. London                       | 1965                       |
| 3           | I. N. Levine                         | Quantum Chemistry                      | Allyn and Bacon, Boston                         | 1983                       |
| 4           | H. Eyring, J. Walter and G. Kimball, | Quantum Chemistry, Quantum Chemistry   | John Wiley and Sons, New York,                  | 1944                       |
| 5           | M. W. Hanna                          | Mechanics in Quantum Chemistry         | W.A. Benjamin Inc. London                       | 1965.                      |
| 6           | G. M. Barrow                         | Introduction to Molecular Spectroscopy | McGraw Hill, New York                           | 1988.                      |
| 7           | D. A. McQuarrie                      | Quantum Chemistry                      | University Science Books, MilValley, California | 1998.                      |
| 8           | B. K. Sen.                           | Quantum Chemistry                      | Tata McGraw Hill                                | 1992                       |
| 9           | A. K. Chandra                        | Introduction to Quantum Chemistry      | Tata McGraw Hill                                | 1997.                      |

|     |  |  |  |      |
|-----|--|--|--|------|
| 10  | W. Levine  | Quantum Chemistry                      | Prentice Hall  | 1994 |
| 11  | R. K. Prasad   | Quantum Chemistry                      | Wiley Eastern  | 1993 |
| 12  | C. F. Banwell  | Fundamentals of Molecular Spectroscopy | McGraw Hill, New York                                | 1966 |
| 13  | D. A. Skoog and D. M. West                             | Fundamentals of Analytical Chemistry   | Holt Rinehart and Winston Publications, IV Edn       | 1982 |
| 14. | D. A. Skoog, D. M. West, F. J. Holler and S. R. Crouch | Fundamentals of Analytical Chemistry   | Thomson Asia Pte Ltd., Singapore, 8 <sup>th</sup> Ed | 2004 |
| 15. | D. A. Skoog  | Principles of Instrumental Analysis    | Saunders College Pub.Co, 3 <sup>rd</sup> Ed          | 1985 |
| 16. | Willard, Merit, Dean and Settle                        | Instrumental Methods of Analysis       | CBS Publishers and Distributors, 4 <sup>th</sup> Ed  | 1989 |
| 17  | G. D. Christian and J. E. O. Reilly                    | Instrumental Analysis                  | Allyn and Bacon Inc, 2 <sup>nd</sup> Ed              | 1986 |
| 18  | R. S. Drago  | Physical methods in chemistry          | Reinhold, New York                                   | 1968 |
| 19  | V. K. Ahluwalia  | Reduction in Organic Synthesis         | CRC Press, 1 <sup>st</sup> Ed                        | 2012 |

#### REFERENCE BOOKS

| S.No | Authors                                 | Title                              | Publishers           | Year of publication |
|------|---|------------------------------------|----------------------|---------------------|
| 1.   | G.D. Christian and J.E.G. Reily, Allegn | Instrumental Analysis              | Becon II Edition     | 1986                |
| 2.   | Wilson alld                             | Comprehensive Analytical Chemistry | Wilson series.       | 1986                |
| 3.   | R.C. Kapoor and B.S. Aggarwal           | Principles of Polarography         | Wiley Easter Limited | 1991                |
| 4.   | Kolthoff and Elwing                     | Treatise on Analytical Chemistry   |                      |                     |
| 5.   | H.A. Strobel, Addison                   | Chemical Instrumentation           | Wesley Publ. Co      | 1976                |



**TEACHING METHODOLOGY:**

- PowerPoint presentation
- Group discussion
- Seminar and Assignments
- Animated videos
- Board and chalk

**SYLLABUS DESIGNERS:**

1. Dr.PN.Sudha, Principal, Department of Chemistry
2. Dr.M.Nagarathinam, Head & Associate Professor, Department of Chemistry
3. Dr.S.Santha Lakshmi, Assistant Professor, Department of Chemistry
4. Dr.S.Sashikala, Assistant Professor, Department of Chemistry
5. Dr.N.Dhanam, Assistant Professor, Department of Chemistry
6. Dr. K. Vijayalakshmi, Assistant Professor, Department of Chemistry
7. Dr. T. Gomathi, Assistant Professor, Department of Chemistry
8. Mrs. J. Saranya, Assistant Professor, Department of Chemistry
9. Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

**ELECTIVE PAPER-A: MODERN SYNTHETIC STRATEGIES AND RENEWABLE ENERGY RESOURCES**

| Semester | Subject Code | Category | Instruction Hours |              |          |              |           |              | Credits |
|----------|--------------|----------|-------------------|--------------|----------|--------------|-----------|--------------|---------|
|          |              |          | Lecture           |              | Theory   |              | Practical |              |         |
|          |              |          | Per Week          | Per Semester | Per Week | Per Semester | Per Week  | Per Semester |         |
| II       |              | Elective | 3                 | 45           | 3        | 45           | 0         | 0            | 3       |

**COURSE OBJECTIVES:**

- ❖ To understand the basic aspects of organic reactions in terms of acceptor, donor synthons, retrosynthetic analysis and various types of organic syntheses involved in accessing natural products.
- ❖ To understand the mechanism, synthetic utility of transition metal catalyzed organic reactions, concept of asymmetric synthesis, various types of total synthesis involved in natural products, advantages of green reactions and their utility.

**COURSE OUTCOMES:**

- On the successful completion of course, students will be able to

| CO Number | CO statement  | Knowledge level |
|-----------|---|-----------------|
| CO1       | Use retrosynthetic method for the logical dissection of complex organic molecules and devise synthetic methods                    | K3 & K2         |
| CO2       | Learn various organic reactions and reagents used in them as tools applied in the art of organic synthesis                        | K3 & K2         |
| CO3       | Gain knowledge about structural elucidation of steroids, synthesis of various natural products                                    | K2 & K4         |
| CO4       | Learn the importance of minimizing waste, saving power and doing organic synthesis according to the principles of green chemistry | K2 & K3         |
| CO5       | Acquire knowledge about the applications of various types of renewable energy sources and biofuel cells                           | K3 & K4         |

\* CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

### MAPPING WITH PROGRAM OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | M   | M   | M   | M   | S   | S   |
| CO2 | M   | M   | S   | S   | S   | M   |
| CO3 | M   | M   | M   | M   | S   | M   |
| CO4 | M   | S   | S   | S   | S   | M   |
| CO5 | M   | S   | S   | S   | M   | M   |

### UNIT-I: SYNTHETIC METHODOLOGY

9 hrs

Synthons (acceptor and donor) – Synthetic equivalent – Target molecule – Retrosynthetic analysis – 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 – and 1,6 – deoxygenated skeletons and dicarbonyls – Umpolung, antithesis, 1,3 – Dipolar cycloaddition methodologies (Azide, nitrile oxide, azomethine ylides and carbonyl ylides) – Concept of Tandem, cascade and domino reactions in organic synthesis – Various types of cyclization and ring formation reaction – anionic, cationic, radical and transition metal mediated cyclizations.

### UNIT-II: NOVEL REAGENTS AND ASYMMETRIC SYNTHESIS

9 hrs

Protection and deprotection of functional groups (R-OH, R-CHO, RCOR, R-NH<sub>2</sub> and R-COOH) – Role of palladium and nickel catalysts in organic reactions including Pd(0), Ni(0), Pd(II) and Ni(II) complexes – Typical reactions involving Heck, Negishi,

Suzuki – Miyaura, Kumada, Sonogashira, Stille and Hiyama coupling for carbon-carbon bond formation reactions – Buchwald – Hartwig coupling for the carbon – heteroatom bond formation reactions.

Selectivity – Resolution – Kinetic resolution reactions – Desymmetrization – Asymmetric induction – Chiral auxiliary – Generation of Asymmetric synthesis – Substrate – Auxiliary – Reagent and Catalyst control. Auxiliary controlled alkylation of chiral enolates – Evans oxazolidones, chiral hydrazones and chiral imines – Enders RAMP/SAMP and chiral sulfoxide – Asymmetric oxidation [dihydroxylation, epoxidation Sharpless, Jacobsen, Shi] and Asymmetric reduction (Noyori, Corey, Pfaltz) – Boranes reduction.

### **UNIT-III: STEROIDS AND TOTAL SYNTHESIS OF NATURAL PRODUCTS 9 hrs**

Structural elucidation of cholesterol, stigmasterol and ergosterol – synthesis of cholesterol – conversion of cholesterol to progesterone, oestrone and testosterone- Biosynthesis of cholesterol and bile acids.

Classification of Organic Synthesis. Demonstration of various types of total syntheses using alkaloid (Epibatidine and Ibogamine), Prostaglandin (PGE<sub>1</sub>) and Terpenes (longifolene and cedrene). Total synthesis of quinine, morphine, reserpine, cocaine and papaverine

### **UNIT-IV: ESSENTIALS OF GREEN CHEMISTRY**

**9 hrs**

Introduction to green chemistry-definition, origin, history, needs, goals, twelve principles of green chemistry – Usage of Conventional and Green solvents-Advantages, Limitations and drawbacks – Green Synthesis – Designing, Choice of starting materials, choice of reagents, choice of catalysts – biocatalysts, polymer supported catalysts – choice of solvents – Synthesis involving basic principles of green chemistry – Examples: synthesis of adipic acid, methyl methacrylate, paracetamol – Microwave, Ultrasonication and Ultrasound assisted reactions – esterification, reduction and coupling reactions.

### **UNIT-V: RENEWABLE ENERGY RESOURCES**

**9 hrs**

Renewable energy sources – types of renewable energy sources – Solar cells – basic principles, types and their applications – Fuel cells – basic principles, types and their applications. Working principle and applications of Biofuel cells – brief introduction about hydroelectric, biomass, wind power and geothermal power and their applications and limitations – energy from some other natural source.

**Distribution of hours: Theory-100%; Problems-Nil**

**TEXT BOOKS**

| S.No | Authors  | Title  | Publishers  | Year of publication |
|------|--|--|---|---------------------|
| 1    | Jiro Tsuji   | Palladium Reagents and Catalysts   | Wiley & Sons  | 1995                |
| 2    | M. B. Smith and Jerry March                        | Advanced Organic Chemistry   | John Wiley & Sons, 5 <sup>th</sup> Ed                   | 2001                |
| 3    | W. Carruthers                                      | Some Modern Methods of Organic Synthesis                                     | Cambridge University Press, 3 <sup>rd</sup> Ed, Reprint | 1998                |
| 4    | R. O. C. Norman and J. M. Coxon                    | Principles of Organic Synthesis  | Chapman & Hall, 3 <sup>rd</sup> Ed                      | 1993                |
| 5    | Louis S. Hegedus                                   | Transition Metals in the Synthesis of Complex Organic Molecules              | University Science Books, 2 <sup>nd</sup> Ed            | 1999                |
| 6    | L. Brandsma, S. F. Vasilevsky and H. D. Verkruisje | Applications of Transition Metal Catalysts in Organic Synthesis              | Springer-Verlag   | 1999                |
| 7    | R. E. Gawley & J Aube                              | Principles of Asymmetric Synthesis   | Elsevier, 2 <sup>nd</sup> Ed                            | 2012                |
| 8    | Noyori, R  | Asymmetric Catalysis in Organic synthesis                                    | Wiley   | 2001                |
| 9    | I. L. Finar, t                                     | Organic Chemistry Vol 2, Stereochemistry and the Chemistry of Natural Produc | Dorling Kindersley India (P) Ltd                        | 2009                |
| 10   | Corey and Cheng                                    | The Logics of Chemical Synthesis   | John Wiley & Sons                                       | 1989                |
| 11   | K.C. Nicolau and                                   | Classics in Total  | Wiley   | 1996                |

|     |  |   |  |      |
|-----|--|---|--|------|
|     | Sorenson                                   | Synthesis   |  |      |
| 12  | P. T. Anastas and T. C. Williamson         | Frontiers in Benign Chemical Syntheses and Processes, Green Chemistry       | Oxford University Press, Oxford                | 1998 |
| 13  | V. K. Ahluwalia                            | Methods and Reagents of Green Chemistry: An Introduction by Green Chemistry | Kluwer Academic Publisher & Anamaya Publishers | 2004 |
| 14. | R. A, Sheldon, I. Arends and Ulf. Hanefeld | Green Chemistry and Catalysis   | John Wiley & Sons                              | 2007 |
| 15. | <u>Gadi Rothenberg</u>                     | Catalysis: Concepts and Green Applications                                  | John Wiley & Sons                              | 2015 |

### **REFERENCE BOOKS**

| <b>S.No</b> | <b>Authors</b>                | <b>Title</b>                                      | <b>Publishers</b>                          | <b>Year of publication</b> |
|-------------|-------------------------------|---|--|----------------------------|
| 1           | W. Carruther and Jain Coldham | Modern Methods of organic synthesis               | Cambridge University Press, 4th edition    | 2015                       |
| 2.          | Micheal B. Smith              | Organic Syntheis                                  | McGraw Hill, 2 <sup>nd</sup> edition       | 2002                       |
| 3.          | Stuart Warren                 | organic synthesis, the disconnection approach     | John Wiley and sons (Asia) Pvt. Ltd.       | 2008                       |
| 4.          | R.E. Ireland                  | Organic synthesis                                 | Prentice hall of India, Pvt. Ltd New Delhi | 1975                       |
| 5.          | V.K. Ahluwalia                | Green Chemistry: Environmentally Benign Reactions | CRC press                                  | 2008                       |

**TEACHING METHODOLOGY:**

- Board and chalk
- PowerPoint presentation
- Group discussion
- Seminar and Assignments
- Animated videos
- Board and chalk

**SYLLABUS DESIGNERS:**

1. Dr.P.N.Sudha, Principal, Department of Chemistry
2. Dr.M.Nagarathinam, Head & Associate Professor, Department of Chemistry
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4. Dr.S.Sashikala, Assistant Professor, Department of Chemistry
5. Dr.N.Dhanam, Assistant Professor, Department of Chemistry
6. Dr. K. Vijayalakshmi, Assistant Professor, Department of Chemistry
7. Dr. T. Gomathi, Assistant Professor, Department of Chemistry
8. Mrs. J. Saranya, Assistant Professor, Department of Chemistry
9. Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

**ELECTIVE PAPER-B: PHARMACEUTICAL CHEMISTRY**

| Semest<br>er | Subje<br>ct<br>Code | Catego<br>ry | Instruction Hours |                     |                 |                     |                 |                     | Credi<br>ts |
|--------------|---------------------|--------------|-------------------|---------------------|-----------------|---------------------|-----------------|---------------------|-------------|
|              |                     |              | Lecture           |                     | Theory          |                     | Practical       |                     |             |
|              |                     |              | Per<br>Wee<br>k   | Per<br>Semest<br>er | Per<br>Wee<br>k | Per<br>Semest<br>er | Per<br>Wee<br>k | Per<br>Semest<br>er |             |
| II           |                     | Elective     | 3                 | 45                  | 3               | 45                  | 0               | 0                   | 3           |

**COURSE OBJECTIVES:**

- ❖ To study about the drug metabolism and effect of various drugs.
- ❖ To enhance the knowledge in the various areas of molecular modelling, molecular docking, drug design techniques with detail concepts of all the mentioned areas.

**COURSE OUTCOME:**

- On completion of the course, the student should be able to:

| CO Number | CO statement   | Knowledge level |
|-----------|--|-----------------|
| CO1       | Acquire knowledge on the importance of drugs, drug administration, drug metabolism, elimination and discuss the challenges faced in each step of the drug discovery process. | K2 & K3         |

|            |   |                    |
|------------|---|--------------------|
| <b>CO2</b> | Get knowledge about the industrial methods using for drug preparation and formulation.      | <b>K3 &amp; K4</b> |
| <b>CO3</b> | Understand the pharmaceutical industry regulation for manufacturing, packing and marketing. | <b>K3 &amp; K4</b> |
| <b>CO4</b> | Gain knowledge about important drugs and its adverse effects.                               | <b>K2 &amp; K3</b> |
| <b>CO5</b> | Acquire knowledge about anaesthetics, antihistamines and organic pharmaceuticals.           | <b>K3 &amp; K4</b> |

\* CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

### **MAPPING WITH PROGRAM OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | S          | S          | M          | M          | M          |
| <b>CO2</b> | M          | S          | M          | M          | S          | M          |
| <b>CO3</b> | M          | S          | S          | S          | S          | M          |
| <b>CO4</b> | M          | S          | S          | M          | S          | M          |
| <b>CO5</b> | M          | M          | S          | S          | M          | S          |

### **UNIT - I: CLASSIFICATION OF DRUGS**

**9 hrs**

Classification of drugs based on sources - mode of administration - site of action, absorption of drugs - Drugs distribution and elimination - Role of kidney in elimination.

Drug design- Development of new drugs - procedures followed in drug design, concepts of prodrugs and soft drugs.

### **UNIT - II : INDUSTRIAL ASPECTS - I**

**9 hrs**

Unit operation – Principle – extraction - maceration and percolation method – Drying: Tray dryer and drum dryer – Evaporation - Climing film evaporators and calandria – Distillation - Fractional distillation and bubble cap column steam distillation – Centrifugation - Supercentrifugation and non-perforated basket – Filtration: filter press and drum filter – Comminution - mortar and pestle type and Bal mills - types of formulation - Importance of it – factors affecting formulation - finished pharmaceuticals - packing materials - olymers, plastics and metals – closures - repacking.

### **UNIT - III : INDUSTRIAL ASPECTS –II**

**9 hrs**

Regulations - pharmacopeia - Good manufacturing practices (GMP) – Material Management- Laboratory controls- Validations- Drug analysis - aspirin, paracetamol and ciprofloxacin.

**UNIT - IV : EFFECT OF DRUGS****9 hrs**

Adverse responses and side effects of drugs, allergy - Drugs intolerance - Drug addiction, drug abuses and their biological effects. Anticancer drugs: Anticancer drugs and their mechanism of action-Natural and man made radioisotopes and their applications. Antipsychotic drugs- the neuroleptics, antidepressant, butyrophenones, serendipity and drug development.

**UNIT - V : ANAESTHETICS, ANTIHISTAMINES AND ORGANIC PHARMACEUTICALS****9 hours**

Anaesthetics - General and local - gaseous anaesthetics - ether and vinyl ether - halogenated hydrocarbons like chloroform - intravenous anesthetics - thiopentalsodium and cocaine - Antiseptics and disinfectants - Phenols and related compounds - formaldehyde and ethanol.

Antihistamines - classification H1 and H2 receptor antagonists.

Organic Pharmaceuticals - their role as preservatives and food additives.

**Distribution of Marks:** Theory-100%

**TEXT BOOKS**

| S.No | Authors                       | Title  | Publishers                                      | Year of publication |
|------|-------------------------------|--|---|---------------------|
| 1.   | Foye, Williams O              | Principles of Medicinal Chemistry, 7 <sup>th</sup> edition | Wolters kluwer, lippincott Williams and vikkins | 1996                |
| 2.   | G.R Chatwal                   | Synthetic Drugs  | Himalaya Publisher                              | 2009                |
| 3.   | Dr. Jayashree Gosh, S. Chand  | A Textbook of Pharmaceutical Chemistry                     | S. Chand and company limited                    | 2014                |
| 4.   | A. O Bentley                  | Textbook of Pharmaceutical Chemistry                       | Oxford Univ., Press.                            | 1925                |
| 5.   | M.N Chatterje and Rana shinde | Text book of Medical Biochemistry, 8 <sup>th</sup> edition | Jaypee Brothers pub                             | 2012                |
| 6.   | A. Berger                     | Medicinal Chemistry, Vol 1 &2                              | Wiley Interscience, New York                    | 1990                |
| 7.   | Asutoshkar                    | Medicinal Chemistry  | Wiley Eastern                                   | 1992                |



|    |                      |                                      |                     |      |
|----|----------------------|--------------------------------------|---------------------|------|
|    |                      |                                      | Ltd., Chennai       |      |
| 8. | Bentely and Driver's | Textbook of Pharmaceutical Chemistry | Oxford Univ. Press. | 1985 |

### **REFERENCE BOOKS**

| S.No | Authors                    | Title   | Publishers                        | Year of publication |
|------|----------------------------|---|-----------------------------------|---------------------|
| 1.   | Asuthosh Kar,              | Medicinal Chemistry, Revised, 3 <sup>rd</sup> edition | New Age, International Publishers | 2005                |
| 2..  | G.R. Chatwal, Madhu Arrora | Pharmaceutical Chemistry organic                      | Himalaya Pub                      | 2008                |
| 3.   | H.J Roth, A. Kleemann      | Pharmaceutical Chemistry : vol.1 Drug synthesis       | Ellis horwood Ltd.                | 2001                |

### **TEACHING METHODOLOGY:**

- Board and chalk
- PowerPoint presentation
- Models
- Group discussion
- Seminar and Assignments
- Animated videos

### **SYLLABUS DESIGNERS:**

1. Dr.P.N.Sudha, Principal, Department of Chemistry
2. Dr.M.Nagarathinam, Head & Associate Professor, Department of Chemistry
3. Dr.S.Santha Lakshmi, Assistant Professor, Department of Chemistry
- 4.Dr.S.Sashikala, Assistant Professor, Department of Chemistry
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- 6.Dr. K. Vijayalakshmi, Assistant Professor, Department of Chemistry
7. Dr. T. Gomathi, Assistant Professor, Department of Chemistry
8. Mrs. J. Saranya, Assistant Professor, Department of Chemistry
- 9.Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

### **ELECTIVE PAPER-C: HETEROCYCLIC CHEMISTRY**

| Semest<br>er | Subje<br>ct<br>Code | Catego<br>ry | Instruction Hours |                     |                 |                     |                 |                     | Credi<br>ts |
|--------------|---------------------|--------------|-------------------|---------------------|-----------------|---------------------|-----------------|---------------------|-------------|
|              |                     |              | Lecture           |                     | Theory          |                     | Practical       |                     |             |
|              |                     |              | Per<br>Wee<br>k   | Per<br>Semest<br>er | Per<br>Wee<br>k | Per<br>Semest<br>er | Per<br>Wee<br>k | Per<br>Semest<br>er |             |
| II           |                     | Elective     | 3                 | 45                  | 3               | 45                  | 0               | 0                   | 3           |

## **COURSE OBJECTIVES**

- ❖ To study about the chemistry of heterocyclic compounds.
- ❖ To enhance the knowledge strategies for designing the chemical synthesis for higher heterocycles.

## **COURSE OUTCOME**

- On completion of the course, the student should be able to:

| <b>CO Number</b> | <b>CO statement</b>   | <b>Knowledge level</b> |
|------------------|---|------------------------|
| <b>CO1</b>       | Gain knowledge about aromatic compounds and aromatic heterocyclic compounds.  | <b>K2 &amp; K3</b>     |
| <b>CO2</b>       | Get knowledge about strain, bond angle strain, torsional strain and their consequences in small ring heterocycles and conformations of six membered heterocycles. | <b>K3 &amp; K4</b>     |
| <b>CO3</b>       | Understand about the three membered, four membered and five membered heterocyclics.   | <b>K3 &amp; K4</b>     |
| <b>CO4</b>       | Acquire knowledge about mesoionic heterocyclics.  | <b>K2 &amp; K3</b>     |
| <b>CO5</b>       | Gain knowledge about higher heterocyclic compounds  | <b>K3 &amp; K4</b>     |

\* CO-Course Outcomes

Knowledge level K1-Remember; K2-Understand; K3-Apply; K4-Analyze

## **MAPPING WITH PROGRAM OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | M          | S          | M          | M          | M          |
| <b>CO2</b> | M          | S          | M          | S          | S          | M          |
| <b>CO3</b> | M          | S          | S          | S          | S          | M          |
| <b>CO4</b> | M          | S          | S          | M          | S          | M          |
| <b>CO5</b> | M          | M          | M          | S          | S          | S          |

## **UNIT I: NOMENCLATURE OF HETEROCYCLES**

**9 hrs**

Introduction - nomenclature systems - systematic nomenclature system (Hantzsch – Widman system) and replacement nomenclature system for monocyclic, fused, spiro and bridged heterocycles - Aromatic heterocycles – Introduction - chemical behavior of aromatic heterocycles - classification (structural types) - Criteria of aromaticity in heterocycles (bond lengths, dipole moments, empirical resonance energy, delocalization energy, Dewar resonance energy, chemical shifts and <sup>1</sup>HNMR spectra).

**UNIT- II: NONAROMATIC HETEROCYCLES****9 hrs**

Introduction - strain, bond angle strain - torsional strain and their consequences in small ring heterocycles - conformations of six membered heterocycles - molecular geometry - barriers to ring inversion - pyramidal inversion and 1,3 - diaxial interactions. Stereoelectronic effect in saturated six membered heterocycles- anomeric effect - other related effects and attractive interactions through space.

**UNIT III: SMALL RING HETEROCYCLES****9 hrs**

Three membered and four membered heterocycles - Synthesis and reactions of aziridines, oxiranes, thiranes, azetidines, oxetanes and thietanes - Benzo- fused five membered heterocycles: Synthesis and reactions including medicinal applications of benzopyrroles, benzofurans and benzothiophenes.

**UNIT- IV: MESO - IONIC HETEROCYCLES****9 hrs**

General classification - chemistry of some important meso-ionic heterocycles of type A and B and their applications - Six membered heterocycles with one heteroatom - Synthesis and reactions of pyrylium salts and pyrones and their comparisons with pyridinium and thiopyrylium salts and pyridines

**UNIT-V: HIGHER HETEROCYCLES****9 hrs**

Six membered heterocycles with two or more heteroatoms Synthesis and reactions of diazines. triazines and tetrazines - Seven and large membered heterocycles - Synthesis and reactions of azepines, oxepines, thiepinines and diazepines - Synthesis of five and six membered heterocycles with P, As, Sb and Bi.

**Distribution of Marks:** Theory-100%

**TEXT BOOKS:**

| S.No | Authors   | Title                         | Publishers                        | Year of publication |
|------|---|-------------------------------|-----------------------------------|---------------------|
| 1.   | Gupta, M. Kumar and V.Gupta                             | Heterocyclic Chemistry        | Vol. 1 Springer Verlag -3, R. R   | 1998                |
| 2.   | T. Eicher and S. Hauptmann, Thieme                      | The Chemistry of Heterocycles | First Edition,                    | 2003                |
| 3.   | J. A. Joule, K. Mills and G. F. Smith, Chapman and Hall | Heterocyclic Chemistry        | London, New York : Chapman & Hall | 1995                |
| 4.   | T. L. Gilchrist   | Heterocyclic Chemistry        | Longman Scientific Technical      | 2017                |
| 5.   | G. R. Newkome and W.W. Paudler                          | Contemporary Heterocyclic     | Wiley -inter Science.             | 1982                |

|  |  |           |  |  |
|--|--|-----------|--|--|
|  |  | Chemistry |  |  |
|--|--|-----------|--|--|

#### REFERENCES BOOKS:

| S.No | Authors                               | Title   | Publishers                                  | Year of publication |
|------|---------------------------------------|---|---|---------------------|
| 1.   | R. M. Acheson,<br>John Wiley.         | An Introduction to the<br>Heterocyclic<br>Compounds | Interscience<br>Publishers                  | 1960                |
| 2.   | A. R. Katritzky and<br>C.W. Rees, eds | Comprehensive<br>Heterocyclic Chemistry             | Pergamon<br>press, Elsevier<br>Science, Ltd | 1996                |

#### TEACHING METHODOLOGY:

- Board and chalk
- PowerPoint presentation
- Models
- Group discussion
- Seminar and Assignments
- Animated videos

#### SYLLABUS DESIGNERS:

1. Dr.P.N. Sudha, Principal, Department of Chemistry
2. Dr.M.Nagarathinam, Head & Associate Professor, Department of Chemistry
3. Dr.S.Santha Lakshmi, Assistant Professor, Department of Chemistry
- 4.Dr.S.Sashikala, Assistant Professor, Department of Chemistry
- 5.Dr.N.Dhanam, Assistant Professor, Department of Chemistry
- 6.Dr. K. Vijayalakshmi, Assistant Professor, Department of Chemistry
7. Dr. T. Gomathi, Assistant Professor, Department of Chemistry
8. Mrs. J. Saranya, Assistant Professor, Department of Chemistry
- 9.Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

## II SEMSTER

### ORGANIC CHEMISTRY PRACTICALS –I

| Semester | Subject Code | Category | Instruction Hours |              |          |              |           |              | Credits |
|----------|--------------|----------|-------------------|--------------|----------|--------------|-----------|--------------|---------|
|          |              |          | Lecture           |              | Theory   |              | Practical |              |         |
|          |              |          | Per Week          | Per Semester | Per Week | Per Semester | Per Week  | Per Semester |         |
| II       |              | Core     | 0                 | 0            | 0        | 0            | 5         | 75           | 5       |

#### **COURSE OBJECTIVES:**

Students should be able to apply principles of separation and isolation techniques in organic reactions and also to synthesize some important organic molecules.

#### **COURSE OUTCOME:**

At the end of the course, the students should be able to separate the organic mixtures using separating funnel and purity of components can be checked by measuring their melting point/boiling point. Identification of components in a two-component mixture and preparation of their derivatives. Determination of b.p. / m.p. for the components.

Any Six preparation from the following

- (i) Preparation of o-benzyl benzoic acid
- (ii) p-Nitrobenzoic acid from p-nitrotoluene
- (iii) Anthraquinone from anthracene
- (iv) Benzhydrol from Benzophenone
- (v) m-Nitroaniline from m-dinitrobenzene
- (vi) 1,2,3,4 – Tetrahydrocarbazole from phenyl hydrazine
- (vii) p-chlorotoluene from p-toluidine
- (viii) 2,3 – Dimethylindole from phenyl hydrazine and 2 – butanone (boiling acetic acid)
- (ix)** Methyl orange from sulphanilic acid

#### **REFERENCE BOOKS:**

1. Organic Chemistry Laboratory Manual, Dr. M. S. Gnanaprakasam, Visvanathan Pvt., Ltd.,
2. A text book of Practical Organic Chemistry by Arthur I. Vogel
3. Laboratory Manual of Organic Chemistry Raj K. Bansal, Wiley Eastern limited.

**TEACHING METHODOLOGY:**

- Board and chalk
- Demonstration
- Conducting practicals
- Conducting Viva

**SYLLABUS DESIGNERS:**

1. Dr. P.N. Sudha, Principal, Department of Chemistry
2. Dr.M.Nagarathinam, Head & Associate Professor, Department of Chemistry
3. Dr.S.Santha Lakshmi, Assistant Professor, Department of Chemistry
4. Dr.S.Sashikala, Assistant Professor, Department of Chemistry
5. Dr.N.Dhanam, Assistant Professor, Department of Chemistry
6. Dr. K. Vijayalakshmi, Assistant Professor, Department of Chemistry
7. Dr. T. Gomathi, Assistant Professor, Department of Chemistry
8. Mrs. J. Saranya, Assistant Professor, Department of Chemistry
9. Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

**ORGANIC CHEMISTRY PRACTICALS – I**

| Semester | Subject Code | Category | Instruction Hours |              |          |              |           |              | Credits |
|----------|--------------|----------|-------------------|--------------|----------|--------------|-----------|--------------|---------|
|          |              |          | Lecture           |              | Theory   |              | Practical |              |         |
|          |              |          | Per Week          | Per Semester | Per Week | Per Semester | Per Week  | Per Semester |         |
| II       |              | Core     | 0                 | 0            | 0        | 0            | 5         | 75           | 5       |

**COURSE OBJECTIVES:**

The students should be able to apply the principles of qualitative and quantitative analytical techniques (semi micro) in inorganic chemistry for compound identification by group separation and to prepare different metallic coordination complexes.

**COURSE OUTCOMES:**

At the end of the course, the students should be able to plan and conduct experiments for identifying inorganic compounds and preparing the coordination complexes

**UNIT - I**

Semimicro qualitative analysis of mixture containing two common and two less familiar cations.

The following are the less familiar cations to be included. W, Ti, Te, Se, Ce, Zr, V, Li, Mo.

## UNIT - II

- a) Colorimetric experiments – Estimation of Fe, Ni, Cu and Mn.
- b) Preparation of the following (any 5):
  - (i) Potassium tris(oxalato)aluminate (III) trihydrate
  - (ii) Tris (thiourea)copper (I) chloride
  - (iii) Potassium tris(oxalato)chromate (III) trihydrate
  - (iv) Sodium dithiosulphatocuprate (I)
  - (v) Tris(thiourea)copper (I) sulphate
  - (vi) Tetrammine copper(II)sulphate

### REFERENCE BOOKS

1. Textbook of quantitative Analysis, A. Vogel, CBS Pub.,
2. Quantitative Inorganic Analysis, Upadhyaya, S. Chand & Co., Ltd.,
3. Advanced Practical Chemistry, Chatterjee, Books & Allied (P) Ltd

### TEACHING METHODOLOGY:

- Board and chalk
- Demonstration
- Conducting practicals
- Conducting Viva

### SYLLABUS DESIGNERS:

1. Dr.P.N.Sudha, Principal, Department of Chemistry
2. Dr.M.Nagarathinam, Head & Associate Professor, Department of Chemistry
3. Dr.S.Santha Lakshmi, Assistant Professor, Department of Chemistry
4. Dr.S.Sashikala, Assistant Professor, Department of Chemistry
5. Dr.N.Dhanam, Assistant Professor, Department of Chemistry
6. Dr. K. Vijayalakshmi, Assistant Professor, Department of Chemistry
7. Dr. T. Gomathi, Assistant Professor, Department of Chemistry
8. Mrs. J. Saranya, Assistant Professor, Department of Chemistry
9. Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

## PHYSICAL CHEMISTRY PRACTICALS - I

| Semester | Subject Code | Category | Instruction Hours |              |          |              |           |              | Credits |
|----------|--------------|----------|-------------------|--------------|----------|--------------|-----------|--------------|---------|
|          |              |          | Lecture           |              | Theory   |              | Practical |              |         |
|          |              |          | Per Week          | Per Semester | Per Week | Per Semester | Per Week  | Per Semester |         |
| II       |              | Core     | 0                 | 0            | 0        | 0            | 5         | 75           | 5       |

### **COURSE OBJECTIVES:**

The students should be able to validate the conceptual understanding acquired from the theory classes

### **COURSE OUTCOMES:**

At the end of the course, the students should be able to explain the principle behind the experiments performed in the laboratory plan and perform experiments and interpret experimental results

### **Experiments for Physical Chemistry Practical – I**

1. Study of the kinetics of acid catalysed hydrolysis of ester and determine the relative strength of acids
2. Determination of the temperature coefficient and Arrhenius activation energy and frequency factor for the acid catalysed hydrolysis of ester
3. Study the iodination of acetone catalysed by acids.
4. Study of the kinetics of reaction between potassium iodide and persulphate and determination of the rate constant of primary salt effect
5. Study of the kinetics of reaction between KI and  $K_2S_2O_8$  and determination of the order
6. Study of the phase diagram for a simple binary system
7. Study of the adsorption of oxalic acid by charcoal [Fruendlich isotherm]
8. Determination of the distribution coefficient of iodine between  $CCl_4$  and water (Demo)
9. Determination of the equilibrium constant for the reaction between potassium iodide and iodine by partition method (Demo).
10. Determination of the concentration of the given unknown potassium iodide solution using partition method (Demo).
11. Study the inversion of cane sugar in the presence of acid using Polarimeter

### **TEACHING METHODOLOGY:**

- Board and chalk
- Demonstration



- Conducting Experiments
- Conducting Viva

#### **SYLLABUS DESIGNERS:**

1. Dr.P.N.Sudha, Principal, Department of Chemistry
2. Dr.M.Nagarathinam, Head & Associate Professor, Department of Chemistry
3. Dr.S.Santha Lakshmi, Assistant Professor, Department of Chemistry
4. Dr.S.Sashikala, Assistant Professor, Department of Chemistry
5. Dr.N.Dhanam, Assistant Professor, Department of Chemistry
6. Dr. K. Vijayalakshmi, Assistant Professor, Department of Chemistry
7. Dr. T. Gomathi, Assistant Professor, Department of Chemistry
8. Mrs. J. Saranya, Assistant Professor, Department of Chemistry
9. Mrs. R. Bharathi Priyadharsini, Assistant Professor, Department of Chemistry

#### **SCHEME OF VALUATION FOR PRACTICAL EXAMINATIONS**

##### **ORGANIC CHEMISTRY PRACTICALS-I**

##### **Organic practicals - Max. Marks: 60**

|                              |                                  |
|------------------------------|----------------------------------|
| Record                       | - 10                             |
| Qualitative organic analysis | - 30                             |
| Preparation                  | - 10 (Quality – 3 & Quantity- 7) |
| Viva                         | - 10                             |
|                              | ----                             |
|                              | 60                               |
|                              | ----                             |

##### **Qualitative Organic Analysis: 30**

|                        |       |
|------------------------|-------|
| Pilot Separation       | - 4   |
| Aliphatic/Aromatic     | - 2+2 |
| Saturated/Unsaturated  | - 2+2 |
| Elements (N, X & S)    | - 3+3 |
| Functional Group tests | - 2+2 |
| Confirmatory           | - 2+2 |

Derivative - 2+2

## SCHEME OF VALUATION FOR PRACTICAL EXAMINATIONS

### INORGANIC CHEMISTRY PRACTICALS – I

**Inorganic Practical : Max. Marks :60**

|                      |                                  |
|----------------------|----------------------------------|
| Record               | - 10                             |
| Colorimetry          | - 10 (Experiment-7+ Procedure-3) |
| Preparation          | - 10 (Quality-3+ Quantity- 7)    |
| Qualitative Analysis | - 20 (Each radical – 5)          |
| Viva                 | - 10                             |
|                      | _____                            |
|                      | 60                               |
|                      | _____                            |

### Calorimetry:

Result: 7 Marks

| Instrument | Marks |
|------------|-------|
| % error    |       |
| 5%         | 7     |
| 7%         | 5     |
| 10%        | 4     |
| 12%        | 3     |
| Above 12%  | 2     |

## SCHEME OF VALUATION FOR PRACTICAL EXAMINATIONS

### PHYSICAL CHEMISTRY PRACTICALS-I

#### Maximum marks :60

|              |   |    |
|--------------|---|----|
| Record       | - | 10 |
| Manipulation | - | 20 |
| Practical    | - | 20 |
| Viva voce    | - | 10 |

**60**

#### Practical:

##### For all experiments

|             |           |
|-------------|-----------|
| Calculation | : 5 marks |
| Graph       | : 7 marks |

#### Result

|                |           |
|----------------|-----------|
| Error up to 5% | : 8 marks |
| 6 to 10%       | : 5 marks |
| > 10%          | : 3 marks |

### QUESTION PAPER PATTERN

#### Section-A (5 Questions x 6 marks = 30 marks)

- ❖ Questions in Section-A will contain 10 questions in “Either Or” pattern drawn from 5 units (two questions from each unit in either or pattern)

#### Section-B (3 Questions x 15 Marks = 45 Marks)

- ❖ Questions in Section-B will contain 5 questions of open choice drawn from 5 units (One question from each unit)

## DEPARTMENT OF PHYSICS- ALLIED

### PROGRAMME OUTCOMES (PO):

**PO 1:** Students attain proficiency in Critical thinking, analytical thinking and Problem solving and perform Computations and logical reasoning.

**PO 2:** Students will be able to enhance to solve problems.

**PO 3:** To understand the role of chemistry and mathematics in daily life and in the society.

**PO 4:** To create thirst in critical thinking, analyzing and problem solving skills.

**PO 5:** To develop the activity in understanding and applying the principles in science.

## Allied Physics I

| Semester | Subject Code | Category | Lecture | Theory  |             | Practical | Credit |
|----------|--------------|----------|---------|---------|-------------|-----------|--------|
|          |              |          |         | Hr/week | Hr/Semester |           |        |
| I        |              | Allied   | 60 Hrs  | 4       | 60          | NIL       | 4      |

### COURSE OBJECTIVES:

- Apply Physics principles and mathematical methods of various fields of Physics.
- To explain various Physical, Electrical and Optical properties of materials.
- To obtain the intellectual ability to translate, interpret and extrapolate the most important scientific models and laws governing the motion of objects.

### COURSE OUTCOMES:

On the successful completion of this course students will be able

| CO Number  | CO Statement  | Knowledge Level(K1-K4) |
|------------|---|------------------------|
| <b>CO1</b> | To get the basic knowledge about materials which they use their day today life and its practical applications.  | K2                     |
| <b>CO2</b> | To analysis basics of optics and apply them to intuitive capability to research on things involved in light and | K4                     |
| <b>CO3</b> | To design and trouble shoot basic electrical circuits and to classify the magnetic materials                    | K3                     |
| <b>CO4</b> | To extend the application oriented knowledge of Ultrasonic waves and its role in building construction.         | K2                     |
| <b>CO5</b> | To construct, simple electronic components and to apply them in their day-today life.                           | K3                     |

Knowledge level: K1-Remember, K2-Understanding Level, K3-Apply, K4 –Analysis.

### MAPPING WITH PROGRAMME OUTCOMES

| Cos        | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| <b>CO1</b> | M   | M   | S   | S   | S   |
| <b>CO2</b> | S   | S   | S   | M   | M   |
| <b>CO3</b> | S   | M   | S   | S   | M   |
| <b>CO4</b> | S   | S   | S   | S   | S   |
| <b>CO5</b> | S   | S   | S   | S   | S   |

S- Strong      M – Medium      L – Low

## ALLIED PHYSICS I

### UNIT-I: PROPERTIES OF MATTER

12 Hrs

**Elasticity:** Hooke's Law-Elastic Constants- Relation between three moduli of elasticity- Stress and strain diagram- Poisson's ratio- Bending of Beam-Bending Moment-Cantilever- Depression at the Loaded End of the Cantilever- Determination of Young's Modulus by Non-Uniform Bending- I shape Girder-Principle and Working of Atomic force microscopy.

**Torsion:** Torsion couple- Potential Energy in a Twisted Wire- Torsional Pendulum - Rigidity Modulus-Determination of Rigidity Modulus by Torsional Oscillation (Without Masses)-Applications of Torsion Springs- in Clocks-Clocks Pin- automotive-Medical Equipments & Door Hinges.

**Viscosity:** Viscosity of Liquids-Viscous Force-Stokes' law-Co-Efficient Of Viscosity of a Liquid- Poiseuille's formula (No Derivation)-Determination of Co-Efficient of Viscosity (Graduated Burette method) -Comparison of Viscosities of Two Liquids by Graduated Burette Method- Applications of Viscosity in day today life (any five).

### UNIT- II: OPTICS

12 Hrs

Defects of Images (Lens): Spherical aberration- Methods to minimize spherical aberration-minimizing spherical aberration with two lenses out of contact- Rainbow-Primary Rainbow.

Physical Optics: Coherent sources -Interference- Determination of diameter of a thin wire by air wedge- Test for optical flatness- Interference in Mechanical & Radio waves -Holograms-applications of holography.

Polarisation: Optical activity- specific rotatory power of an optically active substance- Determination of specific rotatory power of a solution using Laurent half-shade polarimeter- uses of polarized light. Applications of Polarized Light: LCD.

### UNIT-III: ELECTRICITY AND MAGNETISM

12 Hrs

Electricity-Transient current-Growth and decay of charge containing Resistance and Capacitor in a circuit (RC-Series Circuit) -Growth and decay of current in a circuit containing Inductance and resistance (LR series circuit) - smart screen-touch screen - voltage type-current type.

Introduction to magnetism- magnetic Induction (B)-magnetisation (M)-magnetic intensity (H)-relation between B & M- Different types of magnetic materials (dia- , para- , ferro – and antiferro)- hysteresis loop.

#### **UNIT-IV: SOUND AND ACCOUSTICS OF BUILDING**

**12Hrs**

**Sound:** Transverse vibration of strings- Velocity and frequency of vibrations of a stretched string- laws of vibrations along a stretched string- Sonometer- A.C.Frequency- Steel wire-Brass wire.

**Ultrasonic's:** Introduction to Ultrasonics -Production of Sound waves by Piezo-electric method-Properties and uses-applications of ultrasonics: SONAR and NDT.

**Acoustics of buildings:** Reverberation- Reverberation time- conditions for the perfect acoustics.

#### **UNIT-V: DIGITAL ELECTRONICS**

**12 Hrs**

**Junction diode**-Construction and working of AND, OR, NOT, NAND and NOR gates using diodes-Demorgan's theorem-Zener diode characteristics-Zener diode as voltage regulator-Rectifier-full wave bridge rectifier.

Integrated Circuits- SSI- MSI- LSI- VLSI- Advantages of IC's- Limitations of IC's- Fabrication of diode and transistor by monolithic technology.

#### **TEACHING METHODOLOGY:**

- Class Room Teaching
- Assignments
- Discussions
- Home Test
- PPT Presentations
- Mini Projects
- Demo using Models

#### **TEXT BOOKS**

| <b>S.NO</b> | <b>AUTHORS</b>           | <b>TITLE</b>          | <b>PUBLISHERS</b>                                  | <b>YEAR OF PUBLICATION</b> |
|-------------|--------------------------|-----------------------|--|----------------------------|
| 1.          | R. Murugesan             | Allied Physics        | Chand & Co. First Edition                          | 2005                       |
| 2.          | Prof. Dr.G.Ravichandran, | Allied Physics Part-I | Ppadmapriya Publications, Puducherry First Edition | 2007                       |
| 3.          | D.S.Mathur               | Element of            | S.Chand & Co.                                      | 1999                       |

|    |                                      |   |                                    |      |
|----|--------------------------------------|---|------------------------------------|------|
|    |                                      | Properties of matter                                      |                                    |      |
| 4. | Prof. Subramaniam                    | Optics  | S.Chand & Co.                      | 2007 |
| 5. | R. Murugesan,                        | Modern physics  | S.Chand & Co.                      | 2004 |
| 6. | Hugh D. Young and Roger A. Freedman, | Sears & Zemansky's University Physics with Modern Physics | Pearson publications, 14th Edition | 2015 |

### REFERENCE BOOKS

| S.NO | AUTHORS   | TITLE                                 | PUBLISHERS       | YEAR OF PUBLICATION |
|------|---|---------------------------------------|------------------|---------------------|
| 1.   | Venugopal   | Digital Circuits and systems          | Tata McGraw Hill | 2011                |
| 2.   | S. Salivahanan & N. S.Kumar,                                    | Electronic Devices and circuits       | Tata McGraw Hill | 2012                |
| 3.   | U.Tietze,   | Handbook of design and applications   | Ch. Schenk,      | 2008                |
| 4.   | Integrated Electronics: Analog and Digital circuits and Systems | Jacob Millmann and Christos C Halkias | McGraw Hill,     | 2013                |

### WEB SOURCE:

1. <http://www.scienceclarified.com/everyday/Real-Life-Chemistry-Vol-3-Physics-Vol-1/Fluid-Mechanics-Real-life-applications.html>
2. <http://www.circuitstoday.com/monolithic-ic>
3. <https://www.elprocus.com/ever-wondered-lcd-works/>

### SYLLABUS DESIGNER

1. **Dr.C.Vinothini,**  
Assistant Professor & Head,
2. **Dr. N. Jabena Begum,**  
Assistant Professor,

## Allied Physics II

| Semester | Subject Code | Category | Lecture | Theory  |             | Practical | Credit |
|----------|--------------|----------|---------|---------|-------------|-----------|--------|
|          |              |          |         | Hr/week | Hr/Semester |           |        |
| II       |              | Allied   | 60 Hrs  | 4       | 60          | 2         | 6      |

### COURSE OBJECTIVES:

- To understand the basic knowledge with the contents of, Fundamentals of Materials Science
- To know about the basis of nanomaterials and its characterization and applications, and also to know about the principles used in the characterization techniques used to study the nanomaterials.
- To understand and describe the principles behind various superconducting applications

### COURSE OUTCOMES:

On the successful completion of this course students will be able

| CO Number  | CO Statement  | Knowledge Level(K1-K4) |
|------------|---|------------------------|
| <b>CO1</b> | To develop critical thinking on the nature of materials like conductors, semiconductors and dielectrics | K3                     |
| <b>CO2</b> | To analyze different types of crystal structures and its behaviour                                      | K4                     |
| <b>CO3</b> | To understand the principle behind nanomaterial and its applications in various fields.                 | K2                     |
| <b>CO4</b> | To extend the application oriented knowledge on communication technology.                               | K3                     |
| <b>CO5</b> | To understand the basis of superconductivity and to apply them in our day today life                    | K2                     |

Knowledge level: K1-Remember, K2-Understanding Level, K3-Apply, K4 –Analysis.

### MAPPING WITH PROGRAMME OUTCOMES

| Cos        | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | S   | S   | S   |
| <b>CO2</b> | S   | S   | S   | S   | M   |
| <b>CO3</b> | M   | M   | S   | M   | S   |
| <b>CO4</b> | M   | S   | S   | M   | M   |
| <b>CO5</b> | S   | S   | S   | S   | S   |



**ALLIED PHYSICS II****UNIT I: CONDUCTOR, SEMICONDUCTOR AND DIELECTRIC MATERIALS 12hrs**

Solids-Classification of solids - Energy band theory - Electrical and thermal properties: Conductors-semiconductors and dielectrics - Intrinsic & extrinsic semiconductors - n-type and p-type semiconductor-reason for using copper instead of aluminium conductors in electrical installation work- Hall Effect- Sensors.

**UNIT-II: CRYSTALLOGRAPHY** **12hrs**

Crystalline and amorphous solids-lattice-Unit cell - Primitive cell – lattice parameters- Lattice planes-classification of crystal system - Bravias lattice - Miller indices –Bragg’s law-structure determination-XRD technique- reciprocal lattice (concepts only)-crystal imperfections: point, line, surface and volume defects

**UNIT -III: NANOMATERIALS AND ITS APPLICATIONS** **12hrs**

Nanomaterials-Classification of nanomaterials (0D,1D and 2D)-surface to volume ratio- Properties of materials Vs nanomaterials- preparation methods: bottom up and top down method.

Quantum dot-Carbon nanotube (CNT):types and applications-graphene-thin film-thin film in PV technology for energy conversion – as photocatalyst-as anti microbial agents.

**UNIT IV: LASERS AND FIBER OPTICS** **12hrs**

**Lasers:** Principle- Spontaneous and Stimulated Emission - types: CO<sub>2</sub> and dye lasers-applications.

**Fiber Optics:** Principle: Total internal reflection – Acceptance angle -Numerical aperture- Classification of fibres based on refractive index and modes:Step index & Graded index, Single & Multi mode - Fiber optic communication system- block diagram- merits and demerits of fiber optic communication system.

**UNIT V: SUPER CONDUCTIVITY** **12hrs**

Superconductivity and its occurrence- Type I and II superconductors –properties- Meissner effect- isotope effect- postulates of BCS theory- Low temperature and high temperature conductivity -applications of superconductors: SQUIDS-magnetic levitation.

**TEACHING METHODOLOGY:**

- Class Room Teaching
- Assignments
- Discussions

- Home Test
- PPT Presentations
- Demo using Models

**TEXT BOOKS:**

| S.NO | AUTHORS  | TITLE  | PUBLISHERS  | YEAR OF PUBLICATION |
|------|--|--|---|---------------------|
| 1.   | Arumugam M   | Materials Science.   | Anuradha publishers                                   | 2010                |
| 2.   | Pillai S.O.  | Solid State Physics.   | New Age International (P) Ltd., publishers,           | 2009                |
| 3.   | K. Ravichandran,<br>K. Swaminathan,<br>B. Sakthivel,                 | Introduction to Thin Films,                                      | Research India Publications,                          | 2013                |
| 5.   | K. Ravichandran,<br>K. Swaminathan,<br>B. Sakthivel, C.<br>Ravidhas, | Introduction to Characterization of Nanomaterials and Thin Films | Jazym Publications,                                   | 2015                |
| 6.   | Er. Rakesh Rathi   | Nanotechnology   | S.chand Publication                                   | 2009                |
| 7.   | Prof.Dr.G.<br>Ravichandran   | Allied Physics Part-II   | padmapriya Publications,<br>Puducherry, First Edition | 2007                |
| 8.   | B.B. Laud  | Lasers and Non-Linear optics,                                    | New Age International, New Delhi                      | 2011                |
| 9.   | Dr.A.Chandrasekaran  | Engineering Physics  | Scitech publishers                                    | 2019                |

**REFERENCE BOOKS:**

| S.NO | AUTHORS         | TITLE                   | PUBLISHERS          | YEAR OF PUBLICATION |
|------|-----------------|-------------------------|---------------------|---------------------|
| 1.   | Palanisamy P.K. | Materials Science.      | SCITECH Publishers, | 2011                |
| 2.   | Senthilkumar G. | Engineering Physics II. | VRB Publishers,     | 2011                |
| 3.   | Mani P.         | Engineering Physics II. | Dhanam Publications | 2011                |

|    |                                    |   |                                |      |
|----|------------------------------------|---|--------------------------------|------|
| 4. | Marikani A.                        | Engineering Physics   | PHI Learning Pvt.,<br>India,   | 2009 |
| 5. | S.<br>Shanmugam,.                  | Nanotechnology  | TBH Edition                    | 2010 |
| 6. | K.Thyagarajan<br>and Ajay<br>Ghtak | Introduction to Fiber<br>optics                             | Cambridge,<br>University Press | 1999 |
| 7. | John M.<br>Senior,                 | Optical fiber<br>communications:<br>Principles and practice | PHI, 2 <sup>nd</sup> edition.  | 2014 |

#### **WEB SOURCES:**

1. <https://www.electrochem.org/semiconductors-shaping-society>
2. <https://www.scribd.com/doc/26247685/Practical-Applications-of-Electrical-Conductors>
3. <http://hyperphysics.phy-astr.gsu.edu/hbase/Solids/Squid.html>

#### **SYLLABUS DESIGNER**

**1. Dr. N. Jabena Begum,**

Assistant Professor,  
Department of Physics,  
DKM College for Women,  
Vellore.

**2. Dr. C. Vinothini,**

Assistant Professor & Head,  
Department of Physics,  
DKM College for Women,  
Vellore.

## ALLIED PHYSICS PRACTICAL

1. Young's Modulus- Non-uniform bending method using Pin and Microscope.
2. Determination of rigidity modulus by static torsion method.
3. Torsion Pendulum - determination of rigidity modulus – without mass.
4. Determination of Co-efficient of viscosity- Graduated Burette.
5. Determination of surface tension by drop weight method.
6. Specific heat capacity of a liquid- by Newton's law of cooling.
7. Sonometer- Determining A.C Frequency (Screw gauge is given)
8. Potentiometer – calibration of low range voltmeter.
9. Potentiometer – calibration of ammeter
10. Figure of merit and voltage sensitiveness of a galvanometer.
11. Air wedge – diameter of thin wire
12. Spectrometer – determination of angle of prism and refractive index
13. Spectrometer – Grating – minimum deviation –Wavelength of mercury lines.
14. Construction of AND, OR gates using diodes and NOT by using transistor
15. Reverse characteristics of Zener diode-Zener diode as voltage regulator.

### SCHEME OF EVALUATION:

| S.No | Theory         | Theory | Practical's |
|------|----------------|--------|-------------|
| 1    | External marks | 75     | 60          |
| 2    | Internal marks | 25     | 40          |

| S.No | UNITS | 2Marks | 5Marks                     | 10Marks                                       |
|------|-------|--------|----------------------------|---|
| 1    | I     | 1,2    | 1                          | 1 unit (or) 2 unit                            |
| 2    | II    | 3,4    | 2                          |   |
| 3    | III   | 5,6    | 3                          | 3 unit (or) 4unit                             |
| 4    | IV    | 7,8    | 4                          |   |
| 5    | V     | 9,10   | 5                          | 5 unit (or) Either or pattern 1 from any unit |
|      |       |        | 6,7,8 from any three units |   |

## **DEPARTMENT OF ZOOLOGY - UG**

(For the candidates admitted from the academic year 2019-2020 onwards)

### **SEMESTER – I**

| S. No        | Part | Study Component    |              | Ins. Hrs / Week | Credit | Title of the Paper                                 | Maximum Marks 100 |           |       |
|--------------|------|--------------------|--------------|-----------------|--------|--|-------------------|-----------|-------|
|              |      | Course Title       |              |                 |        |  | CIA               | Uni. Exam | Total |
| 1.           | I    | Language           | Paper I      | 6               | 4      | Tamil I  | 25                | 75        | 100   |
| 2.           | II   | English            | Paper I      | 6               | 4      | English I  | 25                | 75        | 100   |
| 3.           | III  | Core Theory        | Paper I      | 6               | 6      | Invertebrata                                       | 25                | 75        | 100   |
| 4.           | III  | Core Practical     | Practical I  | 3               | -      | Invertebrata & Chordata                            | -                 | -         | -     |
| 5.           | III  | Allied-I Theory    | Paper I      | 4               | 4      | Chemistry-I  | 25                | 75        | 100   |
| 6.           | III  | Allied-I Practical | Practical    | 3               | -      | Chemistry  | -                 | -         | -     |
| 7.           | IV   | EVS                | -            | 2               | 2      | Environmental Studies                              | 25                | 75        | 100   |
|              |      |                    |              | 30              | 20     |  |                   |           | 500   |
| SEMESTER-II  |      |                    |              |                 |        |  |                   |           |       |
| 8.           | I    | Language           | Paper II     | 6               | 4      | Tamil II   | 25                | 75        | 100   |
| 9.           | II   | English            | Paper II     | 4               | 4      | English II   | 25                | 75        | 100   |
| 10.          | III  | Core Theory        | Paper II     | 5               | 5      | Chordata   | 25                | 75        | 100   |
| 11.          | III  | Core Practical I   | Practical I  | 3               | 3      | Invertebrata & Chordata                            | 40                | 60        | 100   |
| 12.          | III  | Allied-I Theory    | Paper II     | 4               | 4      | Chemistry-II                                       | 25                | 75        | 100   |
| 13.          | III  | Allied-I Practical | Practical    | 3               | 2      | Chemistry  | 40                | 60        | 100   |
| 14.          | IV   | Value Education    | -            | 3               | 2      | Value Education                                    | -                 | 50        | 50    |
| 15.          | IV   | Soft Skill         | -            | 2               | 1      | Soft Skill   | -                 | 50        | 50    |
| Total        |      |                    |              | 30              | 25     |  |                   |           | 700   |
| SEMESTER-III |      |                    |              |                 |        |  |                   |           |       |
| 16.          | I    | Language           | Paper III    | 6               | 4      | Tamil III  | 25                | 75        | 100   |
| 17.          | II   | English            | Paper III    | 6               | 4      | English III  | 25                | 75        | 100   |
| 18.          | III  | Core Theory        | Paper III    | 4               | 4      | Cell &Molecular Biology                            | 25                | 75        | 100   |
| 19.          | III  | Core Practical     | Practical II | 3               | -      | Cell &Molecular Biology,Genetics and Biotechnology | -                 | -         | -     |

|   |     |                     |               |               |           |  |    |    |            |
|---|-----|---------------------|---------------|---------------|-----------|--|----|----|------------|
| 20.   | III | Allied-II Theory    | Paper I       | 4             | 4         | Botany   | 25 | 75 | 100        |
| 21.   | III | Allied-II Practical | Practical     | 3             | -         | Botany   | -  | -  | -          |
| 22.   | IV  | Skill Based         | Paper I       | 2             | 2         | Public Health & Hygiene                              | -  | 50 | 50         |
| 23.   | IV  | Non Major           | Paper I       | 2             | 2         | Vermiculture   | -  | 50 | 50         |
| <b>Total</b>  |     |                     |               | <b>30</b>     | <b>20</b> |  |    |    | <b>500</b> |
| <b>SEMESTER-IV</b>  |     |                     |               |               |           |  |    |    |            |
| 24.   | I   | Language            | Paper IV      | 6             | 4         | Tamil IV   | 25 | 75 | 100        |
| 25.   | II  | English             | Paper IV      | 6             | 4         | English IV   | 25 | 75 | 100        |
| 26.   | III | Core Theory         | Paper IV      | 4             | 4         | Genetics and Biotechnology                           | 25 | 75 | 100        |
| 27.   | III | Core Practical I    | Practical II  | 3             | 3         | Cell & Molecular Biology, Genetics and Biotechnology | 40 | 60 | 100        |
| 28.   | III | Allied-II Theory    | Paper II      | 4             | 4         | Botany   | 25 | 75 | 100        |
| 29.   | III | Allied-II Practical | Practical     | 3             | 2         | Botany   | 40 | 60 | 100        |
| 30.   | IV  | Skilled based       | Paper I       | 2             | 2         | Biofertilizer Production                             | -  | 50 | 50         |
| 31.   | IV  | Non Major           | Paper I       | 2             | 2         | Mushroom Cultivation                                 | -  | 50 | 50         |
| <b>Total</b>  |     |                     |               | <b>30</b>     | <b>25</b> |  |    |    | <b>700</b> |
| <b>Extra 1 credit for Summer Internship Training Programme (Optional)</b> |     |                     |               |               |           |  |    |    |            |
| <b>SEMESTER-V</b>   |     |                     |               |               |           |  |    |    |            |
| 32.   | I   | Core Theory         | Paper V       | 5             | 5         | Biostatistics & Bioinformatics                       | 25 | 75 | 100        |
| 33.   | II  | Core Theory         | Paper VI      | 4             | 4         | Developmental Biology                                | 25 | 75 | 100        |
| 34.   | III | Core Theory         | Paper VII     | 4             | 4         | Animal Physiology                                    | 25 | 75 | 100        |
| 35.   | III | Elective I          | Paper I       | 5             | 3         | Biochemistry   | 25 | 75 | 100        |
| 36.   | III | Elective II         | Paper II      | 4             | 3         | Human Endocrinology                                  | 25 | 75 | 100        |
| 37.   | III | Core Practical      | Practical III | 3             | -         | Animal Physiology & Developmental Biology            | -  | -  | -          |
| 38.   | IV  | Core Practical      | Practical IV  | 3             | -         | Environmental Biology & Immunology                   | -  | -  | -          |
| 39.   | IV  | Skill Based         |               | 2             | 2         | Aquarium Fish Keeping                                | -  | 50 | 50         |
| <b>Total</b>  |     |                     |               | <b>30 Hrs</b> | <b>21</b> |  |    |    | <b>550</b> |

| <b>SEMESTER-VI</b>  |     |                |               |           |           |   |     |    |            |
|---|-----|----------------|---------------|-----------|-----------|---|-----|----|------------|
| 40.   | III | Core Theory    | Paper VIII    | 5         | 4         | Environmental Biology                     | 25  | 75 | 100        |
| 41.   | III | Core Theory    | Paper IX      | 4         | 4         | Immunology                                | 25  | 75 | 100        |
| 42.   | III | Core Theory    | Paper X       | 4         | 4         | Evolution                                 | 25  | 75 | 100        |
| 43.   | III | Core Practical | Practical III | 3         | 3         | Animal Physiology & Developmental Biology | 40  | 60 | 100        |
| 44.   | III | Core Practical | Practical IV  | 3         | 3         | Environmental Biology & Immunology        | 40  | 60 | 100        |
| 45.   | III | Elective III   | Paper III     | 4         | 3         | Medical Laboratory Technology (MLT)       | 25  | 75 | 100        |
| 46.   | III | Elective IV    | Paper IV      | 4         | 3         | Microbiology                              | 25  | 75 | 100        |
| 47.   | IV  | Skill Based    | Paper IV      | 3         | 2         | Sericulture                               | -   | 50 | 50         |
| Extension Activities  |     |                |               |           | 3         |   | 100 | -  | 100        |
| <b>Total</b>  |     |                |               | <b>30</b> | <b>29</b> |   |     |    | <b>850</b> |
| <b>Extra 1 credit for Mini Project in the VI Semester- Optional- to be submitted on 31<sup>st</sup> March</b> |     |                |               |           |           |   |     |    |            |

### Consolidated Papers and Mark Statements for UG Zoology

| <b>Part</b>  | <b>Subject</b>        | <b>Papers</b> | <b>Credit</b> | <b>Total Credits</b> | <b>Marks</b> | <b>Total Marks</b> |
|--------------|-----------------------|---------------|---------------|----------------------|--------------|--------------------|
| <b>I</b>     | Language              | 4             | 4             | 16                   | 100          | 400                |
| <b>II</b>    | English               | 4             | 4             | 16                   | 100          | 400                |
| <b>III</b>   | Allied Odd Theory     | 2             | 4             | 8                    | 100          | 200                |
|              | Allied Even Theory    | 2             | 4             | 8                    | 100          | 200                |
|              | Allied Even Practical | 2             | 2             | 4                    | 100          | 200                |
| <b>III</b>   | Elective              | 4             | 3             | 12                   | 100          | 400                |
| <b>III</b>   | Core Theory           | 10            | -             | 44                   | 100          | 1000               |
|              | Core Practical        | 4             | -             | 12                   | 100          | 400                |
| <b>IV</b>    | EVS                   | 1             | 2             | 2                    | 100          | 100                |
| <b>IV</b>    | Value Education       | 1             | 3             | 2                    | 50           | 50                 |
|              | SKB                   | 4             | 2             | 8                    | 50           | 200                |
|              | Non Major             | 2             | 2             | 4                    | 50           | 100                |
|              | Soft Skill            | 1             | 1             | 1                    | 50           | 50                 |
|              | Extension Activities  |               | 3             | 3                    |              | 100                |
| <b>Total</b> |                       | <b>41</b>     |               | <b>140</b>           |              | 3800               |

**Consolidated Credits and Total Marks for UG Zoology**

| Semester | Credits | Marks |
|----------|---------|-------|
| I        | 20      | 500   |
| II       | 25      | 700   |
| III      | 20      | 500   |
| IV       | 25      | 700   |
| V        | 21      | 550   |
| VI       | 29      | 850   |
| Total    | 140     | 3800  |

**Consolidated Papers and Mark Statements for UG Zoology**

| Part  | Subject               | Papers | Credit | Total Credits | Marks | Total Marks |
|-------|-----------------------|--------|--------|---------------|-------|-------------|
| I     | Language              | 4      | 4      | 16            | 100   | 400         |
| II    | English               | 4      | 4      | 16            | 100   | 400         |
| III   | Allied Odd Theory     | 2      | 4      | 8             | 100   | 200         |
|       | Allied Even Theory    | 2      | 4      | 8             | 100   | 200         |
|       | Allied Even Practical | 2      | 2      | 4             | 100   | 200         |
| III   | Elective              | 4      | 3      | 12            | 100   | 400         |
| III   | Core Theory           | 10     | -      | 44            | 100   | 1000        |
|       | Core Practical        | 4      | -      | 12            | 100   | 400         |
| IV    | EVS                   | 1      | 2      | 2             | 100   | 100         |
| IV    | Value Education       | 1      | 3      | 2             | 50    | 50          |
|       | SKB                   | 4      | 2      | 8             | 50    | 200         |
|       | Non Major             | 2      | 2      | 4             | 50    | 100         |
|       | Soft Skill            | 1      | 1      | 1             | 50    | 50          |
|       | Extension Activities  |        | 3      | 3             |       | 100         |
| Total |                       | 41     |        | 140           |       | 3800        |

**Consolidated Credits and Total Marks for UG Zoology**

| Semester | Credits | Marks |
|----------|---------|-------|
| I        | 20      | 500   |
| II       | 25      | 700   |
| III      | 20      | 500   |



|       |     |      |
|-------|-----|------|
| IV    | 25  | 700  |
| V     | 21  | 550  |
| VI    | 29  | 850  |
| Total | 140 | 3800 |

## **DEPARTMENT OF ZOOLOGY -UG**

### **PROGRAMME EDUCATIONAL OBJECTIVES (PEO)**

**PEO1.** To make the students to understand habit and habitat and the structure of the lower animals.

**PEO2.** To acquire knowledge on the Entrepreneurial skills of vermiculture, prawn culture, pearl culture etc.,

### **PROGRAMME OUTCOMES (PO)**

**PO1.** To understand the importance of biodiversity and to create awareness on protecting biodiversity, habitat, adaptation, organization and taxonomic status of non-Chordates and Chordates.

**PO2.** To acquire knowledge on the morphology and anatomical structure for the identification and classification of animals.

**PO3.** To develop knowledge on the various modes of adaptations in animals.

**PO4.** To recognise the Economic importance of animals

**PO5.** To analyse the Affinities and relationship between animals

**PO6.** To apply the knowledge in developing Entrepreneurial skills

### **INVERTEBRATA**

| Semester | Subject Code | Category | Lecture  |                      | Theory   |                      | Practical | Credit |
|----------|--------------|----------|----------|----------------------|----------|----------------------|-----------|--------|
|          |              |          | Hrs/week | Total Hours/Semester | Hrs/week | Total Hours/Semester |           |        |
| I        |              | Core I   | 6        | 90                   | 6        | 90                   | Nil       | 6      |

### **COURSE OBJECTIVES**

- To understand the systematic and functional morphology of various groups of invertebrates.

- To study their economic importance, affinities and adaptations.

### **COURSE OUTCOMES (CO)**

On the successful completion of the course, students will be able to:

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| CO1              | <ul style="list-style-type: none"> <li>• To acquire knowledge on diversity of animals and to apply the general taxonomical rules on animal classification</li> </ul>   | K3                             |
| CO2              | <ul style="list-style-type: none"> <li>• To Classify phylum porifera and coelentrata with taxonomic keys</li> <li>• To analyse the economic importance of sponges and coelenterate animals</li> <li>• To recognize the importance of coral reefs as the habitat for various aquatic organisms</li> </ul> | K3                             |
| CO3              | <ul style="list-style-type: none"> <li>• To analyse the causes for the diseases caused by helminth parasites</li> <li>• To acquire the knowledge on the significance of Earthworm as “Farmer’s Friend”</li> </ul>  | K4                             |
| CO4              | <ul style="list-style-type: none"> <li>• To recognise the economic importance of animals</li> <li>• To understand the basic concept of prawn culture, apiculture and pollination.</li> </ul>   | K3                             |
| CO5              | <ul style="list-style-type: none"> <li>• To create the basic knowledge of pearl culture and to understand the economic importance of molluscs</li> <li>• To relate the phylogenetic significance of echinoderm larvae</li> </ul>   | K4                             |

**Knowledge Level:** K1- Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | S          | S          | M          |
| <b>CO2</b> | M          | S          | S          | M          | M          | S          |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO3</b> | M | M | S | S | S | S |
| <b>CO4</b> | S | S | M | M | S | S |
| <b>CO5</b> | S | S | M | S | M | M |

**S- Strong; M – Medium ; L- Low**

Distribution of Marks: Theory 100% and Problems Nil %

## **UNIT – I**

**(16 Hours)**

1.1 Principles of Taxonomy – Binomial nomenclature –Rules of nomenclature; Levels of Organisation; Outline Classification of the animal kingdom.

1.2 Protozoa: General characters and classifications upto class level with examples; Type Study: Plasmodium (Morphology and Life History); Parasitic protozoans in human- Entamoeba, Trypanosoma, Leishmania

## **UNIT – II**

**(18 Hours)**

2.1 Porifera : General characters and classification upto classes with examples; Type Study: Sycon: Structure, histology and canal system; Economic importance of sponges

2.2 Coelenterata : General characters and classification upto classes with examples; Type Study: Obelia (Morphology and Metagenesis); Polymorphism in coelenterates; Coral and coral reefs

## **UNIT – III**

**(19 Hours)**

3.1 Helminthes : General characters and classification upto classes with examples; Type Study: Taenia solium – Morphology and Life History; Parasitic adaptations of Helminthes and disease control; Nematode Parasite – Ascaris lumbricoides, Wuchereria bancrofti (Morphology and Life History)

3.2 Annelida : General characters and classification upto classes with examples; Type study Earthworm : Morphology, Digestive system, Excretory System and Reproductive System

Parasitic adaptations of Leech; Metamerism

## **UNIT –IV**

**(19 Hours)**

4.1 Arthropoda : General characters and classification upto classes with examples; Type Study: Prawn – Morphology, Appendages, Digestive system, Excretory System,

Respiratory system and Reproductive System; Mouth parts of insects (Cockroach, Mosquito, Honey Bee, House Fly and Butterfly).

4.2 Economic importance of insects; Larval forms of Crustacea and their significance; Insecta type study : Cockroach - Digestive system, Nervous system and Urinogenital system

## UNIT – V

(18 Hours)

5.1 Mollusca : General characters and classification upto classes with examples; Type Study: Fresh water mussel – Morphology & Musculature, Digestive, Respiratory and Excretory system; Torsion in Gastropods; Economic importance of Molluscs : Pearl culture and Oyster culture

5.2 Echinodermata : General characters and classification upto classes with examples; Type study: Sea Star – Morphology and Water Vascular system; Echinoderm larvae and their significance.

### TEXT BOOKS:

| S.no | Authors   | Books   | Publishers                      | Year of publication         |
|------|---|---|---------------------------------|-----------------------------|
| 1.   | Ekambaranatha Ayyar M. and T.N. Ananthakrishnan | Manual of Zoology Vol 1 (Invertebrate), Part I and II                                       | S.Viswanathan Pvt.Ltd., Chennai | 1992                        |
| 2.   | Jordan E.L. and P.S.Verma                       | Invertebrata, 12 <sup>th</sup> Edition  | S.Chand and Co.Ltd., New Delhi  | (Revised Edition 2013)      |
| 3.   | Kotpal R.L.                                     | Protozoa, Porifera, Coelenterata, Helminthes, Annelida, Arthropoda, Mollusca, Echinodermata | Rastogi Publishers, Meerut      | 1992 (Revised edition 2012) |

### REFERENCE BOOKS:

|   | Authors            | Books                                     | Publishers                                  | Year of publication |
|---|--------------------|---|---|---------------------|
| 1 | Parker and Haswell | Textbook of Zoology, Vol I (Invertebrate) | A.Z.T.B.S. Publishers and Distributors, New | 1964                |

|   |  |  |                                     |  |
|---|--|--|-------------------------------------|--|
|   |  |  | Delhi                               |  |
| 2 | Borradile L.A. and F.A.Pott                | Invertebrates  | Cambridge University Press, UK      |  |
| 3 | Sedgwick                                   | A Student text book of Zoology, Vol I and II                 |                                     |  |
| 4 | Kotpal R.L., S.K.Agarwal, R.P.R. Khetarpal | Modern Textbook of Zoology                                   | gi Publishers                       |  |
| 5 | s R.D.                                     | Invertebrate Zoology IV Edition                              | Holt Saunders International Edition |  |
| 6 | Barrington E.J.W                           | Invertebrate Structure and Function, 2 <sup>nd</sup> Edition | and Nelson                          |  |

#### **WEB SOURCES:**

[www.sciencedirect.com](http://www.sciencedirect.com).

[www.pubmed.com](http://www.pubmed.com)

[www.khansacademy.com](http://www.khansacademy.com)

#### **TEACHING METHODOLOGY**

- Class room teaching
- Charts/ Models
- PPT Presentations
- Discussions
- Assignments
- Home test

## SYLLABUS DESIGNERS

Dr. K. Devi, HOD & Associate Professor

Dr. D. Sasikala, Assistant Professor

Dr. V. Kiruthiga, Assistant Professor

Dr. V. Rekha, Assistant Professor

Dr. A. Vinodhini, Assistant Professor

## CHORDATA

| Semester | Subject Code | Category | Lecture  |                      | Theory   |                      | Practical | Credit |
|----------|--------------|----------|----------|----------------------|----------|----------------------|-----------|--------|
|          |              |          | Hrs/week | Total Hours/Semester | Hrs/week | Total Hours/Semester |           |        |
| II       |              | Core II  | 5        | 75                   | 5        | 75                   | Nil       | 5      |

### COURSE OBJECTIVES:

To understand the systematic and functional morphology of various groups of chordates.

To study their affinities and adaptations to different modes of life.

### COURSE OUTCOMES (CO)

On the successful completion of the course, students will be able to :

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | <ul style="list-style-type: none"><li>To understand the phylogenetic relationship of non- chordates and chordates</li></ul>  | KI, K2                  |
| CO2       | <ul style="list-style-type: none"><li>To apply the knowledge in identifying different types of fishes and to develop fish culturing practices</li><li>To analyse the adaptations of amphibians</li></ul> | K2, K3                  |
| CO3       | <ul style="list-style-type: none"><li>To recognize the poisonous and non poisonous snakes and to</li></ul>   | K2, K3, K4              |

|     |  |        |
|-----|--|--------|
|     | understand the biting mechanism  |        |
| CO4 | <ul style="list-style-type: none"> <li>To recall the connecting link between animals</li> <li>To understand the migration and flight adaptations of birds</li> </ul> | K1, K2 |
| CO5 | <ul style="list-style-type: none"> <li>To understand the phylogenetic relationship among various mammals</li> </ul>  | K2, K3 |

**Knowledge Level:** K1- Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

Mapping with Programme Outcomes

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | S   | S   | M   |
| CO2 | S   | M   | S   | S   | S   | S   |
| CO3 | M   | M   | M   | M   | M   | S   |
| CO4 | S   | S   | S   | S   | S   | M   |
| CO5 | S   | M   | S   | S   | S   | M   |

**S- Strong; M – Medium ; L- Low**

Distribution of Marks: Theory 100% and Problems Nil

## UNIT – I

**(12 Hours)**

1.1 General characters of Chordata; Classification of Chordates; Origin of Chordates; Morphology of Balanoglossus, Herdmania and Amphioxus;

1.2 Affinities and phylogenetic relationship of Cephalochordata with Hemichordata, Affinities and phylogenetic relationship of Cephalochordata with Urochordata; Structure and affinities of Cyclostomata- Petromyzon

## UNIT – II

**(18 Hours)**

2.1 Pisces - General characters & classification upto orders with examples; Comparative study of Chondrichthyes and Osteichthyes; Type Study: Shark- Morphology, Digestive system, Respiratory system , Circulatory system, Reproductive system and Sense organs; Parental care in fishes; Migration of Fishes

2.2 Amphibia - General characters & classification upto orders with examples; Type Study: Frog – Morphology, Digestive system, Respiratory system , Circulatory system, Reproductive system and Life cycle; Adaptive features of Anura, Urodela and Apoda; Parental care in Amphibia

### **UNIT – III**

**(16 Hours)**

3.1 Reptilia - General characters & classification upto orders with examples; Type Study: Calotes – Morphology, Digestive system, Circulatory system and Urinogenital system.

3.2 Identification of poisonous and non poisonous snakes; Types of poisons; South Indian snakes. Poison apparatus and biting mechanism of poisonous snake.

### **UNIT – IV**

**(14 Hours)**

4.1 Aves - General characters & classification upto orders with examples; Type Study: Pigeon – Morphology, Digestive system, Respiratory system with Air sacs and Circulatory system.

4.2 Archaeopteryx as a connecting link; Migration of Birds; Flight adaptations; Ratitae; Types of feathers.

### **UNIT – V**

**(15 Hours)**

5.1 Mammalia- General characters & classification upto orders with examples; Type Study: Rabbit- Morphology, Integument, Digestive system, Respiratory system , Circulatory system and Reproductive system.

5.2 Flying mammals; Prototheria- Egg laying mammals; Dentition in mammals; Metatheria

### **TEXT BOOKS:**

|    | <b>Authors</b>                                  | <b>Title</b>   | <b>Publishers</b>                       | <b>Year of publication</b> |
|----|---|--|---|----------------------------|
| 1. | Ekambaranatha Ayyar M. and T.N. Ananthakrishnan | Manual of Zoology.Vol. I (Invertebrate), Part I and II | S. Viswanathan (Printers and Publishers | 1992.                      |
| 2. | Jordan E.L. and P.S. Verma                      | Invertebrata Zoology 12 <sup>th</sup> Edition          | S.Chand and Co. Ltd., New Delhi.        | 1993                       |



|    |         |       |                          |      |
|----|---------|-------|--------------------------|------|
| 3. | 1, R.L. | brate | gi Publishers,<br>Meerut | 1992 |
|----|---------|-------|--------------------------|------|

#### REFERENCE BOOKS:

|    | ors                        |                                   | ishers                                | Year of publication |
|----|----------------------------|-----------------------------------|---------------------------------------|---------------------|
| 1. | Nigam H.C.                 | gy of Chordates                   | Vishal Publications,<br>Jalandhar.    | 1983                |
| 2. | Waterman, Allyn J. et al., | Chordate structure and functions. | Mac. Millan and Co., New York         | 1971                |
| 3. | Jollie M.                  | Chordate Morphology.              | East West Press Pvt. Ltd., New Delhi. | 1968                |
| 4. | Hyman L.H..                | Comparative vertebrate Zoology    | McGraw Hill Co., New York             | 1982                |

#### WEB SOURCES:

[www.sciencedirect.com](http://www.sciencedirect.com).

[www.pubmed.com](http://www.pubmed.com)

[www.khansacademy.com](http://www.khansacademy.com)

#### TEACHING METHODOLOGY

- Class room teaching
- Charts/ Models
- PPT Presentations
- Discussions
- Assignments
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#### SYLLABUS DESIGNERS

Dr. K. Devi, HOD & Associate Professor

Dr. D. Sasikala, Assistant Professor

Dr. V. Kiruthiga, Assistant Professor

Dr. V. Rekha, Assistant Professor

Dr. A. Vinodhini, Assistant Professor

## **PRACTICAL – I**

### **INVERTEBRATA & CHORDATA**

| <b>Semester</b> | <b>Subject Code</b> | <b>Category</b>  | <b>Practical</b> |                             | <b>Theory</b> | <b>Practical</b> | <b>Credit</b> |
|-----------------|---------------------|------------------|------------------|-----------------------------|---------------|------------------|---------------|
|                 |                     |                  | <b>Hrs/week</b>  | <b>Total Hours/Semester</b> |               |                  |               |
| II              |                     | Core Practical-I | 3                | 45                          | Nil           | 45 Hrs           | 3             |

### **OBJECTIVES:**

- To understand the systematic and functional morphology of various groups of invertebrates and chordates.
- To study their biological significance, affinities and adaptations to their respective mode of life.
- To relate the structure and functions of various organs of animals.
- To study about the skeletal system of vertebrates

### **I. MAJOR PRACTICAL**

#### **DISSECTIONS**

Cockroach/ Prawn (Nervous system) - Digestive System, Reproductive System & Nervous System

Frog- Digestive System, Urino Genital System (male), Arterial System & Venous System. (model/ chart)

### **II. MINOR PRACTICAL**

#### **MOUNTING**

- 1) Mouth Parts of Cockroach, Mosquito, Honey Bee & House Fly,
- 2) Prawn Appendages
- 3) Shark- Placoid Scale
- 4) Earthworm- body setae

### **SPOTTERS:**

**A) ADAPTATIONS TO THEIR RESPECTIVE MODE OF LIFE**

Entamoeba, Plasmodium, Sycon, Liverfluke, Taenia solium, Nereis, Limulus, Crustacean Larvae- Nauplius, Zoea, Star Fish, Balanoglossus, Ichthyophis, Draco and Bat.

**B) BIOLOGICAL SIGNIFICANCE**

Obelia Colony, Physalia, Trochophore Larva, Peripatus, Bipinnaria Larva, Amphioxus, Shark, Arius, Axolotl Larva, Hyla, Cobra (Poison Apparatus of Cobra), Viper, Pigeon.

**C) RELATE STRUCTURE AND FUNCTION**

Sponge Spicules, Gemmules, Taenia-Scolex, Nereis-Parapodium, Prawn-Appendages, Star Fish-Pedicellaria, Placoid Scale of Shark, Quill Feather of Pigeon.

**D) DRAW NEAT LABELED SKETCH**

T.S of Neries, T.S of Liver Fluke, Obelia medusa, T.S of Amphioxus through Pharynx, T.S through an Arm of Sea Star.

**E) OSTEOLOGY**

Study of the following Skulls with Reference to Dentition- Dog, Rabbit, Man.

Pectoral Girdles of Frog, Calotes, Pigeon, Rabbit.

Pelvic Girdles of Frog, Calotes, Pigeon, Rabbit.

Pigeon- Synsacrum

**DEPARTMENT OF ZOOLOGY - PG**

**(For the candidates admitted from the academic year (2019-2020))**

**SEMESTER-I**

| S. NO | Study Components |             | Hrs/ week | Credit | Title of the Paper                    | Max. Marks |      |       |
|-------|------------------|-------------|-----------|--------|---------------------------------------|------------|------|-------|
|       | Course Title     |             |           |        |                                       | C.A        | Sem. | Total |
| 1     | Core             | Paper- I    | 5         | 5      | Life and diversity of Invertebrates   | 25         | 75   | 100   |
| 2     | Core             | Paper -II   | 5         | 4      | Life and diversity of Chordates       | 25         | 75   | 100   |
| 3     | Core             | Paper -III  | 5         | 5      | Cell and Molecular Biology            | 25         | 75   | 100   |
| 4     | Core             | Practical-I | 4         | -      | Life and Diversity of Invertebrates & | -          | -    | -     |

|               |                  |                  |    |    |  |     |     |     |
|---------------|------------------|------------------|----|----|--|-----|-----|-----|
|               |                  |                  |    |    | Chordates  |     |     |     |
| 5             | Core             | Practical-II     | 4  | -  | Cell and Molecular Biology, Genetics, Biotechnology and Bioinformatics | -   | -   | -   |
| 6             | Core             | Practical-III    | 4  | -  | Environmental Biology & Evolution                                      | -   | -   | -   |
| 7             | Elective         | Paper-I          | 3  | 3  | Aquaculture and Farm Management  | 25  | 75  | 100 |
|               |                  |                  | 30 | 17 |  | 100 | 300 | 400 |
|               | Optional         | Self Study paper |    | 2* | Online Course  | -   | -   | -   |
| SEMESTER – II |                  |                  |    |    |  |     |     |     |
| 8             | Core             | Paper-IV         | 5  | 5  | Genetics   | 25  | 75  | 100 |
| 9             | Core             | Paper-V          | 4  | 4  | Environmental Biology & Evolution                                      | 25  | 75  | 100 |
| 10            | Core             | Paper-VI         | 4  | 4  | Biotechnology and Bioinformatics                                       | 25  | 75  | 100 |
| 11            | Core             | Practical-I      | 4  | 4  | Life and Diversity of Invertebrates & Chordates                        | 40  | 60  | 100 |
| 12            | Core             | Practical –II    | 4  | 4  | Cell and Molecular Biology, Genetics, Biotechnology and Bioinformatics | 40  | 60  | 100 |
| 13            | Core             | Practical –III   | 4  | 4  | Environmental Biology & Evolution                                      | 40  | 60  | 100 |
| 14            | Elective         | Paper-II         | 3  | 3  | Endocrinology  | 25  | 75  | 100 |
| 15            | Compulsory paper |                  | 2  | 2  | Human Rights   | 25  | 75  | 100 |
|               |                  |                  | 30 | 30 |  | 245 | 555 | 800 |
| SEMESTER-III  |                  |                  |    |    |  |     |     |     |
| 16            | Core             | Paper-VII        | 5  | 5  | Animal Physiology  | 25  | 75  | 100 |

|                    |          |                  |    |    |  |     |     |     |
|--------------------|----------|------------------|----|----|--|-----|-----|-----|
| 17                 | Core     | Paper-VIII       | 5  | 5  | Developmental Biology                            | 25  | 75  | 100 |
| 18                 | Core     | Paper-IX         | 5  | 5  | Microbiology & Immunology                        | 25  | 75  | 100 |
| 19                 | Core     | Practical –IV    | 4  | -  | Animal Physiology & Immunology                   | -   | -   | -   |
| 20                 | Core     | Practical –V     | 4  | -  | Developmental Biology & Microbiology             | -   | -   | -   |
| 21                 | Core     | Practical –VI    | 4  | -  | Research Methodology, Biostatistics & Entomology | -   | -   | -   |
| 22                 | Elective | Paper -III       | 3  | 3  | Biophysics & Biochemistry                        | 25  | 75  | 100 |
|                    |          |                  | 30 | 18 |  | 100 | 300 | 400 |
|                    | Optional | Self Study paper |    | 2* | Online Course                                    | -   | -   | -   |
| <b>SEMESTER-IV</b> |          |                  |    |    |  |     |     |     |
| 23                 | Core     | Paper-X          | 6  | 5  | Research Methodology & Biostatistics             | 25  | 75  | 100 |
| 24                 | Core     | Practical –IV    | 4  | 4  | Animal Physiology & Immunology                   | 40  | 60  | 100 |
| 25                 | Core     | Practical –V     | 4  | 4  | Developmental Biology & Microbiology             | 40  | 60  | 100 |
| 26                 | Core     | Practical -VI    | 4  | 4  | Research Methodology, Biostatistics & Entomology | 40  | 60  | 100 |
| 27                 | Elective | Paper-IV         | 3  | 3  | Entomology                                       | 25  | 75  | 100 |
| 28                 | Project  |                  | 9  | 5  |  | 25  | 75  | 100 |
|                    |          |                  | 30 | 25 |  | 195 | 405 | 600 |

### CONSOLIDATED CREDITS AND MARKS FOR P.G. ZOOLOGY (2019-2020)

| Subject          | Papers | Credit | Total credits | Marks | Total marks |
|------------------|--------|--------|---------------|-------|-------------|
| Main Theory      | 10     | 4-5    | 47            | 100   | 1000        |
| Main practical   | 6      | 4      | 24            | 100   | 600         |
| Elective         | 4      | 3      | 12            | 100   | 400         |
| Compulsory paper | 1      | 2      | 2             | 100   | 100         |
| Project          | 1      | 5      | 5             | 100   | 100         |
| Total            | 22     | -      | 90            | -     | 2200        |

### PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

**PEO 1:** To achieve excellence in education and scientific research in the field of Zoology. To develop and implement ways and means to ensure quality performance and outputs of the Zoology program.

**PEO 2:** To improve the skills of graduates in Zoology and to motivate the students by providing them with hands on experimental practices and to incorporate state of the art about life science.

### PROGRAMME OUTCOMES (PO)

**PO1:** To comprehend the systematic position, biodiversity, functional morphology, mode of life, affinities and phylogeny of Invertebrates

**PO2:** To understand the systematic position, hierarchical taxonomy of the chordates and fossils.

**PO3:** To understand the structure and molecular basis of cellular interactions, energy transformation, regulation and control of genes, cell cycle and information transfer.

**PO4:** The objective of the Aquaculture paper is to understand the culture practices of both fin fish and shell fishes in India and World and to understand the scope of employment opportunities in aquaculture.

**PO5:** To acquire the knowledge of the importance of population genetics and nuances of genetic engineering and applied genetics

**PO6:** To generate up-to-date knowledge on environmental conservation and management and to create the awareness on pollution and its management.

## PAPER-1- LIFE AND DIVERSITY OF INVERTEBRATES

| Semester | Subject Code | Category | Lecture  |                      | Theory   |                      | Practical | Credit |
|----------|--------------|----------|----------|----------------------|----------|----------------------|-----------|--------|
|          |              |          | Hrs/week | Total Hours/Semester | Hrs/week | Total Hours/Semester |           |        |
| I        |              | Core     | 4        | 60                   | 4        | 60                   | Nil       | 3      |

### COURSE OBJECTIVES

To comprehend the systematic position, biodiversity, functional morphology, mode of life, affinities and phylogeny of invertebrates.

### COURSE OUTCOMES (CO)

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | To understand the systematic position and classification of invertebrate animals based on their hierarchy. | K2                      |
| CO2       | To understand the evolution and polymorphism of coelenterates and parasitic adaptations of helminthes.     | K2                      |
| CO3       | To imbibe knowledge on the economic importance of invertebrates  | K3                      |
| CO4       | To update the knowledge of mollusca and their evolutionary significance.                                   | K4                      |
| CO5       | To acquire knowledge on phylogeny of invertebrates and fossils.  | K4                      |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyze

### MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | M   | S   | S   |
| CO2 | M   | S   | S   | S   | M   | M   |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO3</b> | S | S | S | M | S | S |
| <b>CO4</b> | S | S | M | S | M | M |
| <b>CO5</b> | S | S | S | S | S | M |

**S- Strong; M – Medium ; L- Low**

#### **UNIT-I**

**(16 Hrs)**

Broad classification of the Animal Kingdom, Affinities and Phylogeny of Invertebrates - Concepts of species, hierarchical taxonomy.

##### **Protozoa**

Feeding, Reproduction and Parasitic adaptations with suitable examples.

Economic importance of Protozoa.

Theories on Origin and evolution of Metazoa.

##### **Porifera**

Functional morphology of Freshwater and Marine sponges with suitable examples.

Reproduction in sponges.

Systematic position and Affinities.

#### **UNIT-II**

**(16 Hrs)**

##### **Coelenterata**

Origin and evolution, Polymorphism and Reproduction.

Corals and Coral reefs.

##### **Helminthes**

Functional morphology and adaptations for parasitic mode of life. Human Helminth diseases.

#### **UNIT-III**

**(16 Hrs)**

##### **Annelida**

Archiannelida. Interrelationship between different classes of Annelida. Origin and evolution of coelom. Adaptive radiation and Metamerism in Annelida.

##### **Arthropoda**

Xiphosura-structure and affinities. Larval forms in crustaceans. Economic importance of Crustaceans. Phylogeny of Arthropoda.

#### **UNIT-IV**

**(16 Hrs)**

##### **Mollusca**

Torsion in Gastropods - Adaptive radiation in Mollusca. Phylogeny of Mollusca.

##### **Echinodermata**

Origin and evolutionary significance of Echinoderm larvae.

#### **UNIT-V**

**(16 Hrs)**

##### **Minor Phyla**

Structural peculiarities and affinities of Nemertinea and Rotifera.

Invertebrate fossils: Trilobites and Brachiopoda



**TEXT BOOKS:**

| <b>S.No</b> | <b>Authors</b>                | <b>Title</b>                               | <b>Publishers</b>                  | <b>Year of Publication</b> |
|-------------|-------------------------------|--|------------------------------------|----------------------------|
| 1.          | Hyman L.H.                    | The Invertebrata, Vol I to VI.             | Mc Graw – Hill Book Co., New York. | 1951                       |
| 2.          | Carter, G.S.A.                | General Zoology of Invertebrates           | Sidewick& Jackson Ltd., London.    | 1969.                      |
| 3.          | Barrington, E.J. W.           | Invertebrate Structure and Functions       | English Language Book Society.     | 1969.                      |
| 4.          | Marshall A.J and Williams W.D | Textbook of Zoology, Vol. I: Invertebrates | 7 <sup>th</sup> Edition – ELBS     | 1976.                      |

**REFERENCE BOOKS:**

| <b>S.No</b> | <b>Authors</b>                                    | <b>Title</b>                  | <b>Publishers</b>                 | <b>Year of Publication</b> |
|-------------|---|-------------------------------|-----------------------------------|----------------------------|
| 1.          | Barnes. R.D                                       | Invertebrate Zoology          | . W.B. Saunders Co.,Philadelphia  | 1974                       |
| 2.          | Borradile, L.A. Eastham, L.E.S. and J.T. Saunders | The Invertebrate              | Cambridge University Press        | 1977                       |
| 3.          | Moore, R.C. Lalicker, C.G. and Fisher,A.G.        | Invertebrate Fossils.         | Mc Graw Hill Book Co., New York   | 1952                       |
| 4.          | Gardinar, M.S.                                    | Biology of the Invertebrates, | McGraw - Hill Book Co., New York. | 1972                       |
| 5.          | Richard C Brusca                                  | Invertebrate Zoology          | Hardcever Publisier               | 2003                       |

**WEB SOURCES:**[www.sciencedirect.com](http://www.sciencedirect.com)[www.pubmed.com](http://www.pubmed.com)[www.livescience.com](http://www.livescience.com)**TEACHING METHODOLOGY**

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**SYLLABUS DESIGNERS**

Dr. K. Devi, HOD &amp; Associate Professor

Dr. K. Suganthi, Assistant Professor

Dr. S. Vijayakumari, Assistant Professor

**PAPER-2- LIFE AND DIVERSITY OF CHORDATES**

| Semester | Subject Code | Category | Lecture  |                      | Theory   |                      | Practical | Credit |
|----------|--------------|----------|----------|----------------------|----------|----------------------|-----------|--------|
|          |              |          | Hrs/week | Total Hours/Semester | Hrs/week | Total Hours/Semester |           |        |
| I        |              | Core     | 4        | 60                   | 4        | 60                   | Nil       | 3      |

**COURSE OBJECTIVES:**

To comprehend the systematic position, functional morphology, mode of life, affinities and biodiversity of chordates

**COURSE OUTCOMES :**

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To understand the new trends in taxonomy of chordate animals.                     | K2                      |
| CO2       | To update the knowledge on affinities and structural peculiarities of vertebrates | K4                      |

|     |  |    |
|-----|--|----|
|     | (fishes)   |    |
| CO3 | To comprehend the fossil history, evolution and adaptive radiation in fishes and amphibian.              | K3 |
| CO4 | To acquire knowledge on the adaptive radiation, fossils of reptiles, birds and the evolution of mammals. | K4 |
| CO5 | To acquire knowledge on comparative anatomy of vertebrates.  | K4 |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyze

#### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | S          | S          | M          |
| <b>CO2</b> | M          | S          | S          | S          | M          | M          |
| <b>CO3</b> | S          | M          | S          | M          | S          | S          |
| <b>CO4</b> | M          | S          | M          | S          | M          | M          |
| <b>CO5</b> | S          | S          | S          | S          | S          | M          |

**S- Strong; M – Medium ; L- Low**

### **UNIT-I: TAXONOMY**

**(16 Hrs)**

#### **Principles of taxonomy**

Nomenclature- Binomial, Trinomial nomenclature.

Suffix as for super family name-(oidea), family name (idea), use of suffixes 'i', 'orum', 'ae', 'arum', 'ensis' and 'iensis'.

#### **Tautonyms synonyms and Homonyms.**

New trends in taxonomy: Ecological approach, Ethological approach, Cytological approach, Biochemical approach and Numerical taxonomy.

**Taxonomic key:** Indented, Simple non-Bracket Grouped type, combination

**Pictorial:** Branching type, Circular and Box-type

### **UNIT-II**

**(16 Hrs)**

**Prochordata:** Systematic position and Phylogeny of Prochordates.

**Ostracoderms:** Silurian and Devonian Ostracoderms. Evolutionary position of the Ostracoderms.

**Placoderms:** Origin of Jaws - Structural peculiarities of Cyclostomata.

### **UNIT-III**

**(16 Hrs)**

**Chondrichthyes:** Fossil history of Chondrichthyes, tendencies in Elasmobranch evolution.

**Actinopterygii:** Origin and evolution, Adaptive radiation of bony fishes.

**Amphibia:** Origin and evolution of Amphibia.

#### UNIT-IV

(16 Hrs)

**Reptilia:** Evolution of Reptilia. Saurischian and Ornithischian Dinosaurs - Rhynchocephalia - Adaptive radiation of Reptiles.

**Aves:** Birds as glorified reptiles. Fossil history of Birds. Palate in Birds. Adaptive radiation in Birds.

**Mammal:** Evolution of Mammals, Structural peculiarities of Prototheria, Metatheria and Eutheria.

#### UNIT-V

(16 Hrs)

**Comparative anatomy:** Origin and evolution of the vertebrate integumentary system. Paired fins and limbs, heart and aortic arches and brain of vertebrates.

#### TEXT BOOKS:

| S.No | Authors                     | Title   | Publishers   | Year of Publication |
|------|-----------------------------|---|--|---------------------|
| 1.   | Jolie. M                    | Chordate Morphology.  | East West Press. Pvt, Ltd,                         | 1968.               |
| 2.   | Romer. A.S and Parson. T.S. | Vertebrate Body   | W.B. Saunders Co., Philaelpia.                     | 1978                |
| 3.   | Holstead                    | The Pattern of Vertebrate Evolution.  | Freeman and Co. San Francisco. U.S.A.              | 1969                |
| 4.   | Kapoor. V.C.                | Theory and Practice of Animal Taxonomy.   | Oxford and IBH Publishing Co., Pvt, Ltd. New Delhi | 1998                |
| 5.   | Kenneth V. Kardong          | Vertebrates- Comparative Anatomy, Functions, Evolution, 4 <sup>th</sup> Edition | Tata McGraw Hill Editions                          | 2011                |

**REFERENCE BOOKS:**

| S.No | Authors         | Title   | Publishers                                 | Year of Publication |
|------|-----------------|---|--|---------------------|
| 1.   | Waterman. A.J   | Chordate Structure and Function.              | McMillan Co. London.                       | 1971                |
| 2.   | Hyman, L.H      | Comparative Vertebrate Anatomy.               | The University of Chicago Press, Chicago.  | 1966                |
| 3.   | Young, J.2      | Life of Vertebrates. Clarendon Press, Oxford. | Clarendon Press, Oxford.                   | 1969                |
| 4.   | Colbert, E.H    | Evolution of Vertebrates.                     | John Wiley and Sons Inc, New York.         | 1969                |
| 5.   | Hobart M. Smith | Evolution of Chordate Structure               | Holt, Rinehart and Winston. Inc. New York. | 1960                |

**WEB SOURCES:**

[www.science direct .com](http://www.science-direct.com)

[www.pubmed.com](http://www.pubmed.com)

[www.livescience.com](http://www.livescience.com)

**TEACHING METHODOLOGY**

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Dr. K. Suganthi, Assistant Professor

Dr. S. Vijayakumari, Assistant Professor

### PAPER-3- CELL AND MOLECULAR BIOLOGY

| Semester | Subject Code | Category | Lecture  |                      | Theory   |                      | Practical | Credit |
|----------|--------------|----------|----------|----------------------|----------|----------------------|-----------|--------|
|          |              |          | Hrs/week | Total Hours/Semester | Hrs/week | Total Hours/Semester |           |        |
| I        |              | Core     | 5        | 75                   | 4        | 75                   | Nil       | 4      |

#### COURSE OBJECTIVES:

To understand the structure and molecular basis of cellular interactions, energy transformation, regulation and control of genes, cell cycle and information transfer.

#### COURSE OUTCOMES:

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | To understand the knowledge on the structure and functions of cell organelles.               | K2                      |
| CO2       | To understand the knowledge on the structure and functions of nucleus and chromosomes.       | K2                      |
| CO3       | To gain the knowledge about cell cycles and cancer cells.                                    | K3                      |
| CO4       | To understand the knowledge on chemistry of DNA and its replication.                         | K2                      |
| CO5       | To gain the knowledge the experimental techniques of DNA replication and mechanism of genes. | K3                      |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyze

#### Mapping with Programme Outcome

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | S   | S   | M   |
| CO2 | S   | M   | S   | S   | M   | M   |
| CO3 | M   | S   | S   | M   | S   | S   |
| CO4 | S   | M   | M   | S   | M   | M   |
| CO5 | S   | S   | S   | S   | S   | M   |

**S- Strong; M – Medium ; L- Low**

**UNIT-I****(16 Hrs)****STRUCTURE AND FUNCTIONS OF CELL ORGANELLES**

**Plasma membrane:** Structure, Membrane receptors, Membrane transport - Membrane Potentials - cell adhesion, intercellular recognition - Intercellular junctions. Endoplasmic reticulum - intracellular transport. Mitochondria - Energetics - cellular respiration - mitochondrial replication. Ribosomes - Structure and function.

**UNIT-II: NUCLEUS AND CHROMOSOMES****(16 Hrs)**

Cytoplasmic interactions, Nuclear receptors - Cell fusion: homokaryons, heterokaryons. Structure and function of Chromatin - Euchromatin and heterochromatin - Polytene and lampbrush Chromosomes.

**UNIT-III: CELL CYCLES AND CANCER CELL****(16 Hrs)**

Cell cycles - its components  $G_0$ - $G_1$  transition - Spindle organization - Chromosome movements - Regulation and synchronization of cell division. Cancer cell: Differences between normal and cancer cell- structural and functional characteristics -Tumour Viruses- Oncogenes - Environmental factors inducing cancer. Hormones in relation to cancer-Theories of carcinogenesis.

**UNIT-IV: DNA REPLICATION AND REPAIR****(16 Hrs)**

Chemistry of DNA - types of DNA - Enzymology and mechanism of DNA replication in prokaryotes - DNA repair- Mismatch repair, Base Excision Repair, Nucleotide Excision Repair.

**UNIT-V: TRANSCRIPTION AND TRANSLATION****(16 Hrs)**

Types of RNA, RNA polymerase, promoters, transcription in prokaryotes and eukaryotes, post transcriptional modification- splicing, capping and poly adenylation. Genetic code, Wobble hypothesis, Mechanism and regulation of translation in prokaryotes and eukaryotes, post translational modifications. antibiotic inhibitors of Protein synthesis.

**TEXT BOOKS:**

| S.No | Authors                                     | Title                       | Publishers                       | Year of Publication |
|------|---|-----------------------------|----------------------------------|---------------------|
| 1.   | De Robertis. E.D.F. and De Robertis. E.M.F. | Cells and Molecular Biology | B.I Publications Pvt Ltd, India. | 2001                |
| 2.   | Lewin. B.                                   | Genes VII                   | Oxford University                | 2000                |

|    |               |  |                            |      |
|----|---------------|--|----------------------------|------|
|    |               |  | Press, New York.           |      |
| 3. | Shanmugam, G. | . A laboratory manipulation in fish            | Madurai Kamaraj University | 1988 |
| 4. | De Witt       | An evolutionary approach. Biology of the cell. | Saunders Company           | 1977 |
| 5. | Karp, G.      | Cell Biology                                   | McGraw Hill Ltd., Japan.   | 1979 |

### REFERENCE BOOKS

| S.No | Authors                    | Title                          | Publishers                                       | Year of Publication |
|------|----------------------------|--------------------------------|--|---------------------|
| 1.   | Howland J.L.               | Cell Physiology                | McMillan Publishing Co., New York                | 1973                |
| 2.   | Avers. C.J.                | Cell Biology                   | Van Nostrand Company, New York                   | 1976                |
| 3.   | Korenberg. A               | DNA Replication                | Dorothy- W.H. Freeman and Company, San Francisco | 1974                |
| 4.   | Hawkins, J.D               | Gene Structure and Expression  | Cambridge University Press, London.              | 1996                |
| 5.   | Albert, B and Watson. J.D. | Molecular Biology of the cell. | Garland Publishing, London.                      | 1990                |



**WEB SOURCES:**[www.sciencedaily.com](http://www.sciencedaily.com)[www.sciencemag.com](http://www.sciencemag.com)[www.treehugger.com](http://www.treehugger.com)[www.nature.com](http://www.nature.com)**TEACHING METHODOLOGY**

- Class room teaching
- Assignments
- Discussions
- Home test
- PPT Presentations
- Demonstration from the Video slides, videos and interactive software.

**SYLLABUS DESIGNERS**

Dr. K. Devi, HOD &amp; Associate Professor.

Dr. K. Suganthi, Assistant Professor.

Dr. S. Vijayakumari, Assistant Professor.

**ELECTIVE PAPER-1 AQUACULTURE AND FISH MANAGEMENT**

| Semester | Subject Code | Category | Lecture  |                      | Theory   |                      | Practical | Credit |
|----------|--------------|----------|----------|----------------------|----------|----------------------|-----------|--------|
|          |              |          | Hrs/week | Total Hours/Semester | Hrs/week | Total Hours/Semester |           |        |
| I        |              | Core     | 5        | 75                   | 5        | 75                   | Nil       | 5      |

**COURSE OBJECTIVES:**

The objective of the paper is to understand the culture practices of both fin fish and shell fishes in India and World.

This paper is planned to teach in the lines of knowing the candidate species of important fin and shell fishes.

Gaining knowledge in the food and feeding habits, investigating the seed production and farm management and method of farming.

This paper also to provide scope for employment opportunities in aquaculture activities.

**COURSE OUTCOMES:**

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K1-K4)</b> |
|------------------|---|--------------------------------|
| <b>CO1</b>       | To get employment opportunities in the Hatchery and Fish farm.  | K3                             |
| <b>CO2</b>       | To able to design and construct fish farm and prawn farm and to maintain the young ones in the hatchery | K4                             |
| <b>CO3</b>       | To understand the techniques on seed production, induced breeding and live feed formulation.            | K2                             |
| <b>CO4</b>       | To acquire knowledge on composite fish culture.   | K4                             |
| <b>CO5</b>       | To understand about the water quality management, fish disease diagnostic methods.                      | K2                             |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyze

**MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | S          | S          | M          |
| <b>CO2</b> | M          | M          | S          | S          | M          | M          |
| <b>CO3</b> | S          | S          | S          | M          | S          | S          |
| <b>CO4</b> | M          | S          | M          | S          | M          | M          |
| <b>CO5</b> | S          | M          | S          | M          | S          | M          |

**S- Strong; M – Medium ; L- Low**

**UNIT-I****(16 Hrs)****INTRODUCTION TO AQUACULTURE**

Importance of aquaculture, Global scenario, Present status in India - Prospects and scope.

## **Aquaculture Farms**

Site selection, topography, water availability and supply, soil conditions and quality. Design and layout, structure and construction.

### **UNIT II: BIOLOGY OF IMPORTANT CULTIVABLE SPECIES AND THEIR**

#### **ECONOMICS**

**(16 Hrs)**

Standard guidance for choosing cultivable species - Seaweeds, Crustaceans (Prawns & Lobsters), Molluscs (Mussels and Oysters) and fishes - Biological criteria - Environmental adaptability and compatibility - Economic importance - economics, market values, by-products and availability in adjacent region.

### **UNIT-III:**

**(16 Hrs)**

#### **SURVEY OF SEED RESOURCES AND SEED & FEED PRODUCTION**

Distribution and abundance of natural seed resources, collection methods and segregation.

Artificial seed production - breeding under controlled condition, induced breeding technique, larval rearing, packing and transportation.

Live feed - Microalgae, Rotifer and Artemia - their culture. Feed formulation - Conventional and non-conventional ingredients, feed additives, feed attractants and feed formulations.

### **UNIT-IV: CULTURE SYSTEMS**

**(16 Hrs)**

Traditional, Extensive, Semi-intensive and intensive systems, composite fish culture, paddy-cum-fish culture, integrated fish culture, sewage water fish culture, raceway culture, cage, pen and rack culture, Culture system management - pond preparation, production and economics.

### **UNIT-V: FARM MANAGEMENT**

**(16 Hrs)**

Water quality management - temperature, salinity, pH, O<sub>2</sub>, CO<sub>2</sub> levels, nutrients and trace elements.

Control of parasites, predators, weeds and diseases in culture ponds.

Disease diagnosis - ELISA, Western blotting - DNA based diagnosis of diseases and fish vaccines.

**TEXT BOOKS:**

| <b>S.No</b> | <b>Authors</b>                       | <b>Title</b>                                      | <b>Publishers</b>                                 | <b>Year of Publication</b> |
|-------------|--------------------------------------|---|---|----------------------------|
| 1.          | Sinha, V.R.P. and Srinivastava, H.C. | Aquaculture Productivity                          | Oxford and IBH Publications Co., Ltd., New Delhi. | 1991                       |
| 2.          | Dash, M.C. and Patnik, P.N.          | Brackish water culture                            | Palani Paramount publications, Palani.            | 1994                       |
| 3.          | Paul Raj, S.                         | Shrimp Farming techniques, Problems and solutions | Palani Paramount Publications, Palani.            | 1995                       |
| 4.          | Ponnuchammy, R.                      | . Practical Guide to shrimp farming.              | . Palani Paramount Publications, palani           | 1997                       |

**REFERENCE BOOKS:**

| <b>S.No</b> | <b>Authors</b>                 | <b>Title</b>                     | <b>Publishers</b>  | <b>Year of Publication</b> |
|-------------|--------------------------------|----------------------------------|--|----------------------------|
| 1.          | Balugut, E.A                   | Aquaculture system and practices | A selected review publishing House, New Delhi.                                     | 1989                       |
| 2.          | Michael, B.N. and Singholka, B | Freshwater Prawn Farming.        | A manual of culture of Macrobrachium rosenbergii. Daya Publishing House, New Delhi | 1985                       |
| 3.          | Paul Raj, S.                   | Aquaculture                      | A.D. Palani Paramount Publications, Palani.  | 2000                       |
| 4.          | Post, G.M                      | Text Book of Fish Health.        | TFH Publication  | 1983                       |

|    |               |                                      |  |      |
|----|---------------|--------------------------------------|--|------|
| 5. | Pillay, T.V.R | Aquaculture Principles and Practices | Blackwell Scientific Publications Ltd. | 1990 |
|----|---------------|--------------------------------------|--|------|

#### WEB SOURCES:

[www.livescience.com](http://www.livescience.com)

[www.sciencemag.com](http://www.sciencemag.com)

[www.treehugger.com](http://www.treehugger.com)

[www.nature.com](http://www.nature.com)

#### TEACHING METHODOLOGY

- Class room teaching
- Assignments
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- PPT Presentation
- Demonstration from the Video slides, videos and interactive software.

#### SYLLABUS DESIGNERS

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Dr. K. Suganthi, Assistant Professor

Dr. S. Vijayakumari, Assistant Professor

### ORGANIC FARMING (Self Study Paper)

#### Unit.1

##### Concept of Organic Farming

**Introduction to Organic Farming-** Scope, Concept, Development, Principles and Need for Organic Farming.

Agencies and Institutions related to Organic Agriculture- Types of Organic Farming- Biodynamic Farming- Benefits and Present State of Organic Farming- Requirements - Components for an Organic Farm.

#### Unit :2

##### Vermicomposting

**Earthworms-** Introduction-Classification and Biology of *Lampito marutii*.

**Vermicomposting Methods** –Anaerobic (Pit) and Aerobic (Heap) method, Tank method, Bin method and Wormery. Harvesting the Compost.

**Bio-fertilizers-** Introduction, Types of Bio-fertilizers-Advantages of using Biofertilizers in Agriculture.

**Unit 3 :****Pest Control and Pest Management**

**Pest Control-** Use of Bio-control agents, Bio-pesticides, Pheromones, trap crops.

**Pest Management-**Introduction-Culture Practices. Biological Pest Management with the Agrivi Farm, Botanical Powder Formulations- Integrated diseases and Pest Management.

**Unit: 4****Plant Protection in Organic Farming**

**Plant Protection** –Introduction-Organic-Integrated and Conventional methods. Plant Protection Strategies in Organic Farming.

**Prevention Methods-** Nutrition Management-Cultivation Practices-Crop rotation.

**Unit:5****Entrepreneurship Development**

**Entrepreneurship-** Concept, Characteristics, Approaches and Need for Entrepreneurship. Agri-Enterprises- Stages of Establishing Enterprise, Project Identification, Step to be Considered in Setting up an Enterprise, Feasibility Report-Product Selection.

**Project Management And Appraisal** – Market, Technical, Social, Financial Analysis. Planning for Marketing, Target Marketing and Competitive Strategy.

**PAPER-4- GENETICS**

| Semester | Subject Code | Category | Lecture  |                      | Theory   |                      | Practical | Credit |
|----------|--------------|----------|----------|----------------------|----------|----------------------|-----------|--------|
|          |              |          | Hrs/week | Total Hours/Semester | Hrs/week | Total Hours/Semester |           |        |
| II       |              | Core     | 3        | 45                   | 3        | 45                   | Nil       | 3      |

**COURSE OBJECTIVES:**

To understand the fine structure of genetic materials and regulation of their action.  
 To know the chromosomal basis of genetic disorders, development and differentiation.  
 Also, to know the importance of population genetics and nuances of genetic engineering and applied genetics.

**COURSE OUTCOMES:**

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| <b>CO1</b>       | To understand the fundamental aspects on structure of DNA and RNA and microbial genetics.        | K2 & K3                        |
| <b>CO2</b>       | To understand the concept of gene action, Operon concept and inborn errors of metabolism in man. | K2                             |
| <b>CO3</b>       | To understand the human genetic disorders and to gain knowledge on genetic counseling.           | K2                             |
| <b>CO4</b>       | To know about the carcinogenesis, mutagens and the population genetics.                          | K4                             |
| <b>CO5</b>       | To gain knowledge on genetic engineering and its applications in hospital with ethics.           | K3 & K4                        |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyze

**MAPPING WITH PROGRAMME OUTCOME:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | S          | S          | M          |
| <b>CO2</b> | M          | M          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | M          | S          | S          |
| <b>CO4</b> | M          | S          | M          | S          | M          | M          |
| <b>CO5</b> | S          | M          | S          | M          | S          | S          |

**S- Strong; M – Medium ; L- Low**

**UNIT-I: MOLECULAR STRUCTURE OF GENETIC MATERIAL (16 Hrs)**

Molecular structure of DNA and RNA - Replication, theories, Gene concept - One gene one polypeptide concept.

Identification of DNA and RNA as the genetic material.

Microbial Genetics - Conjugation, transformation and transduction and Sexduction.

Chromosome mapping in prokaryotes (Virus, Bacteria) and eukaryotes (Neurospora and Man)

**UNIT-II: REGULATION OF GENE ACTION (16 Hrs)**

Enzyme regulation of gene action. Gene regulation of gene action - Operon concept - GAL and LAC Operon system. Evidence of regulation of gene action.

Genes and metabolism. Inborn errors of metabolism in Man (With reference to protein, carbohydrates, Lipid and nucleic acid).

**UNIT-III:****(16 Hrs)****CHROMOSOME AND GENETICS DISORDERS**

Evolution of sex chromosomes. Dosage compensation - X inactivation. Geneomic imprinting.

**Human Genetics:** Normal human karyotype - Variations in karotypes (autosomal and sex chromosomal, structural and numerical) with special reference to classical syndromes in man. Principles and methods of pedigree analysis - statistical evaluation. Genetic counselling - Objectives, ethics and principles . Methods of counselling for point mutation, structural and chromosomal disorders.

**UNIT-IV:****(16 Hrs)****GENES IN DEVELOPMENT, RADIATION GENETICS AND POPULATION GENETICS**

Genes in development and differentiation Mechansim of chromosomal breakage - physical chemical and biological factors or agents. Mutagens and mutagenesis and carcinogenesis - genetic changes in Neoplasia in man.

**Population genetics:**

Population and gene pool. Hardy Weinberg Law-Genetic equilibrium. Factors affecting Hardy Weinberg equilibrium.

Calculation of gene frequencies for Autosomal (Complete dominance, codominance and multiple alleles) and sex linked genes.

**UNIT-V:****(16 Hrs)****GENETIC ENGINEERING AND APPLIED GENETICS**

**Genetic Engineering** - Restrictive enzymes - Recombinant DNA techniques. Applications of Recombinant DNA technology.

**Applied Genetics** - Application of genetics in animal breeding. Application of genetics in Crime and Law - DNA fingerprinting, Genetic basis of inteilgence. Studies on Twins.

**TEXT BOOKS:**

| <b>S.N<br/>o</b> | <b>Authors</b>                       | <b>Title</b>    | <b>Publishers</b>                         | <b>Year of<br/>Publication</b> |
|------------------|--------------------------------------|-----------------|---|--------------------------------|
| 1.               | Daniel L. Hartl                      | Geneties        | Jones and Barflaff<br>Publishing, Boston. | 1994                           |
| 2.               | Lewin, B.                            | Genes VII       | Oxford University<br>Press, New York.     | 2000                           |
| 3.               | Ayala, F. I. and<br>Kieger, J.A. Jr. | Modern Genetics | The Benjamin<br>Publishing Co.<br>London, | 1980                           |



|    |                             |                         |                         |      |
|----|-----------------------------|-------------------------|-------------------------|------|
| 4. | Tamarin, R.H.               | Principles of Genetics  | WCB Publishers<br>Munro | 1996 |
| 5. | Market, C.L. &<br>Ursprung, | Development<br>Genetics | Prentice Hall.          | 1973 |

#### REFERENCE BOOKS:

| S.No | Authors   | Title  | Publishers   | Year of Publication |
|------|---|--|--|---------------------|
| 1.   | Watson. J.D. Hopkins, N.H., Roberts, J.W., Steitz, J.A. and Weiner, A.M | Molecular Biology of the Gene. W.A.                            | Benjamin/Cummings Co., New York.                       | 1987                |
| 2.   | Sinnot. E.W., Dunn. L.C., Dobzhansky, T.H                               | Principles of Genetics   | McGraw Hill Co., New Delhi.                            | 1973                |
| 3.   | Goodenough, U   | Genetics   | Saundes College Publishing Co., London                 | 1984                |
| 4.   | Jenking, J.B.   | Human Genetics   | The Benjamin Cummings Publishing & Co., London         | 1983                |
| 5.   | Pandian, T.J. and Muthukrishnan, J                                      | Research Methods for Gene and Choromosome Manipalation in Fish | Department of Biotechnology, Govt. of India, New Delhi | 1990                |

#### WEB SOURCES:

[www.sciencemag.com](http://www.sciencemag.com)

[www.treehugger.com](http://www.treehugger.com)

[www.nature.com](http://www.nature.com)

#### TEACHING METHODOLOGY

- Class room teaching
- Assignments
- Discussions
- Home test
- PPT Presentations
- Demonstration from the Video slides, videos and interactive software.

## SYLLABUS DESIGNERS

Dr. K. Devi, HOD & Associate Professor  
Dr. K. Suganthi, Assistant Professor  
Dr. S. Vijayakumari, Assistant Professor

## PAPER-5- ENVIRONMENTAL BIOLOGY & EVOLUTION

| Semester | Subject Code | Category | Lecture  |                      | Theory   |                      | Practical | Credit |
|----------|--------------|----------|----------|----------------------|----------|----------------------|-----------|--------|
|          |              |          | Hrs/week | Total Hours/Semester | Hrs/week | Total Hours/Semester |           |        |
| II       |              | Core     | 4        | 60                   | 4        | 60                   | Nil       | 4      |

### COURSE OBJECTIVES:

To understand the nature of relationships among organisms that comprise functioning of ecosystem. To provide the knowledge on interactions between organisms and their environments to drive the dynamics of populations and communities. To know the different types of pollution and their management to protect the health and welfare of human population in the world.

### COURSE OUTCOMES:

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To acquire knowledge on the ecosystem , energy transformations across tropic levels.                            | K3                      |
| CO2       | To gain knowledge on physic-chemical parameters in coastal ecosystem and renewable and non renewable resources. | K4                      |
| CO3       | To analyze the germplasm conservation, cryopreservation and environmental protection acts.                      | K4                      |
| CO4       | To understand the concepts of evolution through fossil evidences.   | K2                      |
| CO5       | To know the process of evolution in   | K4                      |

|  |  |  |
|--|--|--|
|  | mammals, genetic drift, hybridization and role of<br>polyploidy. |  |
|--|--|--|

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyze

#### **MAPPING WITH PROGRAMME OUTCOME:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | S          | S          | M          |
| <b>CO2</b> | M          | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | M          | S          | S          |
| <b>CO4</b> | M          | S          | M          | S          | S          | M          |
| <b>CO5</b> | S          | M          | S          | M          | S          | S          |

**S- Strong; M – Medium ; L- Low**

#### **UNIT-I**

**(16 Hrs)**

##### **ECOSYSTEM AND COMMUNITY**

Review of concept of ecosystem - Natural and Man-made ecosystem, with examples. Energyflow - Trophic structure and levels - Pyramids, food chain and web - ecological efficiencies, and productivity and its measurement.

Definition, nature and flux of energy through communities. Influence of competition, pradation and disturbances - Community succession - homeostasis.

#### **UNIT-II:**

**(16 Hrs)**

##### **HABITAT AND RESOURCES ECOLOGY**

Biomass, Adaptations with reference to physico - chemical features of environment of coastal ecosystems.

Renewable and non - renewable resources - animal resources. Conventional and non - conventional energy sources.

#### **UNIT III:**

**(16 Hrs)**

##### **ENVIRONMENTAL CONSERVATION AND MANAGEMENT**

Principles of conservation - Rain water harvesting - Soil health and fauna - Inputs in agricultural Biosphere reserves - Wildlife conservation and management - biodiversity - Germplasm conservation and cryopreservation.

Problems of urbanization - Sewage, soil waste and industrial waste disposal and management.

Social forestry - tribal welfare. Environmental Protection Act.

**UNIT-IV:****(16 Hrs)****EVIDENCES AND POLYMORPHISM**

**Evidences:** The need of evidences for the fact of evolution - evidences from comparative anatomy, embryology, physiology and biochemistry

Biogeography, Plate tectonics and continental drift - Evidences from systematic, evolutionary taxonomy - Evidences from paleontology - evolutionary trends in fossils, types of fossils.

**Mimicry** - Batesian and Mullerian mimicry and evolution.

**Polymorphism** - Transient and stable - Maintenance of polymorphism.

**UNIT-V:****(16 Hrs)****GENETIC BASIS OF EVOLUTION AND SPECIATION**

Mutations and their role in evolution - the neutralist hypothesis - population size and evolution - the role of genetic drift - hybridization and evolution - The role of polyploidy, isolating mechanisms - pre-mating, post mating - problems of the origin of isolating mechanism.

Genetics and Ecology of speciations. Mayr's founder principle and genetic evolution in the peripheral isolates - Ecological opportunities for speciation.

**HUMAN EVOLUTION** - Sociobiology: Definition and scope - selfish gene, altruism and kin selection - bioethics.

**TEXT BOOKS:**

| <b>S.No</b> | <b>Authors</b>            | <b>Title</b>                               | <b>Publishers</b>  | <b>Year of Publication</b> |
|-------------|---------------------------|--|--|----------------------------|
| 1.          | Berwer. A                 | The Science of ecology                     | Saunders's college publishing                                    | 1988                       |
| 2.          | Alpha Soli, I. Arceivala. | Wastewater treatment for pollution control | Second Ed. Tata McGraw Hill Publication Company Ltd., New Delhi. | 1998                       |
| 3.          | P.A.Moody.                | Introduction to Evolution                  | Harper International.  | 1978                       |
| 4.          | G.L. Stebbins.            | Process of Organic Evolution               | Prentice Hall  | 1979                       |

|    |           |                         |                                |      |
|----|-----------|-------------------------|--------------------------------|------|
|    |           |                         | India, New Delhi.              |      |
| 5. | M. Grene. | Dimensions of Darwinism | Cambridge University Press. UK | 1983 |

#### REFERENCE BOOKS

| S.No | Authors                         | Title                                 | Publishers                             | Year of Publication |
|------|---------------------------------|---------------------------------------|--|---------------------|
| 1.   | Odum. E.P                       | Fundamentals of Ecology.              | Nataraj Publishers                     | 1996                |
| 2.   | Trivedi, P.R.and Gurdeepraj, K. | Environmental Biology                 | Akashdeep Publishing House, New Delhi. | 1992                |
| 3.   | Asthana, D.K. and Asthana, M    | Environmental Problems and Solutions. | S. Chand and Co., New Delhi.           | 2001                |
| 4.   | Abraham,J.C.B                   | Evolution (A Laboratory Manual)       | Macmillan india Ltd.,Chennai           | 1987                |
| 5.   | E.C.Minkoff                     | Evolutionary Biology                  | Addison Wesley,London                  | 1984                |
| 6.   | E.O.Dodson                      | Evolution                             | Reinhold,Newyork                       | 1990                |

#### WEB SOURES:

[www.science daily.com](http://www.science daily.com)

[www.sciencemag.com](http://www.sciencemag.com)

[www.treehugger.com](http://www.treehugger.com)

[www.nature.com](http://www.nature.com)

#### TEACHING METHODOLOGY

- Class room teaching
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- PPT Presentations

#### SYLLABUS DESIGNERS

Dr. K. Devi, HOD & Associate Professor.

Dr. K. Suganthi, Assistant Professor.

Dr. S. Vijayakumari, Assistant Professor.

#### **PAPER-6- BIOTECHNOLOGY AND BIOINFORMATICS**

| <b>Semester</b> | <b>Subject Code</b> | <b>Category</b> | <b>Lecture</b> |                      | <b>Theory</b> |                      | <b>Practical</b> | <b>Credit</b> |
|-----------------|---------------------|-----------------|----------------|----------------------|---------------|----------------------|------------------|---------------|
|                 |                     |                 | Hrs/week       | Total Hours/Semester | Hrs/week      | Total Hours/Semester |                  |               |
| II              |                     | Core            | 4              | 60                   | 4             | 60                   | Nil              | 4             |

#### **COURSE OBJECTIVES:**

To familiarize the use of the data and techniques of engineering and technology in biology for the study of living organisms, to make or modify products or processes for specific use. To understand the basic concepts of bioinformatics in order to analyze through computational management.

#### **COURSE OUTCOMES:**

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| <b>CO1</b>       | To understand the fingerprinting, cloning, blotting techniques and applications of biotechnology in human welfare.         | K2                             |
| <b>CO2</b>       | To acquire knowledge on organ culture, embryo transfer in human, cryobiology and Good laboratory Practices at global level | K3 & K4                        |
| <b>CO3</b>       | To know the practical uses of biotechnology and its applications in medicine, food production and agriculture              | K3                             |
| <b>CO4</b>       | To analyze the information from genomics and proteomics database software.   | K3 & K4                        |
| <b>CO5</b>       | To gain knowledge on algorithm and tool sequence analyzes.   | K3                             |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyze

#### **MAPPING WITH PROGRAMME OUTCOME:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | S          | S          | M          |
| <b>CO2</b> | M          | M          | S          | S          | S          | S          |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO3</b> | S | S | S | M | S | S |
| <b>CO4</b> | S | S | M | S | S | M |
| <b>CO5</b> | S | M | S | M | S | S |

**S- Strong; M – Medium ; L- Low**

#### **UNIT-I:**

**(16 Hrs)**

#### **RECOMBINANT DNA TECHNOLOGY**

Gene cloning - the basic steps - various types of restriction enzymes - ligase linkers and adaptors - c DNA - transformation - Selection of recombinants. Hybridization techniques chemical synthesis of oligonucleotides.

Gene probe - Molecular finger printing (DNA finger printing ) - RFLP - the PCR techniques - Genomic library - Blotting techniques - Southern blotting - Northern blotting - Western blotting.

#### **UNIT-II:**

**(16 Hrs)**

#### **ANIMAL BIOTECHNOLOGY**

Cell culture - Organ culture - whole embryo culture - Embryo transfer - In vitro fertilization (IVF) technology - Dolly - embryo transfer in human. Transgenic animal. Human gene therapy. Cryobiology.

#### **UNIT-III:**

**(16 Hrs)**

#### **ENVIRONMENTAL BIOTECHNOLOGY AND APPLICATIONS OF BIOTECHNOLOGY**

Bioremediation - bioremediation of hydrocarbons - Industrial wastes - Heavy metals - Xenobiotics - bioleaching - biomining - biofuels. Applications of biotechnology in agriculture, medicine and food science. Genetically modified organism (GMO'S) - GM foods. Biotechnology & biosafety - IPR.

#### **UNIT-IV:**

**(16 Hrs)**

#### **BASIC BIOINFORMATICS**

Bioinformatics - Biological / Specialized Database - Servers for Bioinformatics (NCBI, EBI, Genomant) Virtual Library - Data mining - Data Warehousing - Searching techniques - Genomics - Proteomics.

#### **UNIT-V:**

**(16 Hrs)**

#### **ALGORITHM IN BIOINFORMATICS**

Algorithm and tools sequence analysis - Similarity Search - Genetic algorithm - Gene finding - Protein prediction - Biomolecular visualization - Phylogenetic analysis - Drug designing.

**TEXT BOOKS:**

| S.No | Authors                                 | Title   | Publishers                                    | Year of Publication |
|------|---|---|---|---------------------|
| 1.   | R.C.Dubey                               | A text book of biotechnology  | Rajendra Ravindra Printer. New Delhi.         | 2001                |
| 2.   | Dawson, M.T., Powell .R, and Gannon, F. | Gene Technology   | Bios Scientific Publishers                    | 1996                |
| 3.   | Lydell Norris                           | Textbook of Biotechnology   | Syrawood Publishing house                     | 2016                |
| 4.   | Arthur, M.L.                            | Introduction to Bioinformatics  | Oxford University Press, New Delhi.           | 2003                |
| 5.   | Baxevanis, A. and Ouellette, B.F.       | Bioinformatics: A practical guide to the analysis of genes and proteins | Wiley Interscience, Hoboken, New Jersey, USA. | 1998                |

**REFERENCE BOOKS:**

| S.No | Authors                      | Title  | Publishers                               | Year of Publication |
|------|------------------------------|--|--|---------------------|
| 1.   | Purohit, S.S. and S.K.Mathur | Biotechnology Fundamentals and Application         | Agro Botanica, New Delhi                 | 1999                |
| 2.   | Chopra, V.L. and Nanin, A    | Genetic Engineering and Biotechnology.             | Oxford and IBH Publishing Co., New Delhi | 1992                |
| 3.   | Gupta, P.K                   | Biotechnology and Genomics.                        | Rastogi Publications, Meerut             | 2004                |
| 4.   | Higgins D.and Taylor, W.     | Bioinformatics: Sequence, Structure and Databanks. | Oxford University Press, New Delhi       | 2000                |
| 5.   | Westhead, D.R., Parish,      | Bioinformatics.                                    | Viva Books Pvt. Ltd., New Delhi          | 2003                |



|    |                          |   |  |      |
|----|--------------------------|---|--|------|
|    | J.H. and<br>Tugman, R.M. |   |  |      |
| 6. | Arthur M.<br>Lesk.       | Introduction to<br>Protein<br>structure | Oxford<br>University Press,<br>New Delhi | 2006 |

#### WEB SOURCES:

[www.pubmed.com](http://www.pubmed.com)

[www.sciencemag.com](http://www.sciencemag.com)

[www.treehugger.com](http://www.treehugger.com)

[www.nature.com](http://www.nature.com)

#### TEACHING METHODOLOGY

- Class room teaching
- Assignments
- Discussions
- Home test
- PPT Presentations
- Demonstration from the Video slides, videos and interactive software.

#### SYLLABUS DESIGNERS

Dr. K. Devi, HOD & Associate Professor.

Dr. K. Suganthi, Assistant Professor.

Dr. S. Vijayakumari, Assistant Professor.

#### ELECTIVE PAPER-2 ENDOCRINOLOGY

| Semester | Subject Code | Category | Lecture  |                      | Theory   |                      | Practical | Credit |
|----------|--------------|----------|----------|----------------------|----------|----------------------|-----------|--------|
|          |              |          | Hrs/week | Total Hours/Semester | Hrs/week | Total Hours/Semester |           |        |
| II       |              | Core     | 5        | 75                   | 5        | 75                   | Nil       | 5      |

#### COURSE OBJECTIVES:

To acquire knowledge on the structure of Thyroid gland, Parathyroid, Adrenal, Thymus and Pineal gland.

To acquire knowledge on the synthesis of their hormones.

To Understand the gastrointestinal hormones and sex hormones. To understand the role of hormones in pregnancy and lactation.

**COURSE OUTCOMES:**

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K1-K4)</b> |
|------------------|---|--------------------------------|
| <b>CO1</b>       | To understand the structure and functions of hormones and its mechanism.  | K2                             |
| <b>CO2</b>       | To understand the structure and functions of Pituitary, Thyroid and Parathyroid glands.                                     | K2                             |
| <b>CO3</b>       | To understand Structure and functions of the, pancreas, pineal gland, adrenal glands and their action on stress management. | K2 &K3                         |
| <b>CO4</b>       | To acquire knowledge on the hormones secreted by insects, crustaceans and moulting.   | K4                             |
| <b>CO5</b>       | To understand the hormonal control of anuran amphibians and reproductive hormones of male and female gametes in human.      | K3                             |

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyze

**MAPPING WITH PROGRAMME OUTCOMES :**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | M          | M          | S          | S          |
| <b>CO2</b> | M          | S          | S          | S          | M          | M          |
| <b>CO3</b> | S          | S          | S          | M          | S          | S          |
| <b>CO4</b> | S          | S          | M          | S          | M          | M          |
| <b>CO5</b> | S          | S          | S          | S          | S          | M          |

**S- Strong; M – Medium ; L- Low**

**UNIT-I:**

**(16 Hrs)**

**INTRODUCTION TO ENDOCRINOLOGY**

Introduction, objectives and scope of endocrinology - modern concepts and problems in Endocrinology - endocrine glands in crustaceans, insects and vertebrates. Experimental methods of hormone research - general classes of chemical messengers.

**UNIT-II:****(16 Hrs)****PITUITARY AND THYROID GLANDS**

Pituitary gland - characteristics, structural organization - hormone secretion and its functions - Hypothalamic control – Feedback mechanism and releasing factors.

Thyroid gland - structural organizations, metabolic effects of thyroid - effects on reproduction - parathyroid its structure and functions.

**UNIT-III:****(16 Hrs)****PANCREAS AND ADRENAL GLANDS**

Structure of pancreas, pancreatic hormones and their functions.

Structural organizations of adrenals, functions of cortical and medullary hormones.

**UNIT-IV:****(16 Hrs)****INSECTS AND CRUSTACEAN ENDOCRINOLOGY**

Concepts of neurosecretions - endocrine systems in crustaceans - endocrine control of moulting and metamorphosis - neuroendocrine system in insects - endocrine control of moulting - metamorphosis and reproduction.

**UNIT-V:****(16 Hrs)****VERATEBRATE REPRODUCTIVE ENDOCRINOLOGY**

Structure of mammalian testis and ovary - male and female sex accessory organs - hormones of testis and ovary - estrous and menstrual cycle - hormones of pregnancy - parturition - hormonal control of lactation. Hormonal control of metamorphosis in an anuran amphibian.

**TEXT BOOKS:**

| <b>S.No</b> | <b>Authors</b>                              | <b>Title</b>   | <b>Publishers</b>                 | <b>Year of Publication</b> |
|-------------|---|--|-----------------------------------|----------------------------|
| 1.          | Barrington, E.J.W.                          | An introduction to general and comparative endocrinology | Claredon Press Oxford.            | 1985                       |
| 2.          | Philip felig, Lawrence A. Frohman           | Endocrinology and Metabolism                             | McGraw-Hill Medical               | 2001                       |
| 3.          | Melmed, Shlomon Williams and Robert Hardin. | Textbook of endocrinology                                | Philadelphia : Elsevier/Saunders. | 2011                       |
| 4.          | <u>Shlomo Melmed</u>                        | Textbook of Endocrinology                                | Elsevier                          | <b>2016</b>                |

|    |   |                           |                        |      |
|----|---|---------------------------|------------------------|------|
|    | <u>MBChB</u><br><u>MACP ,Kenneth</u><br><u>S. Polonsky MD</u> |                           | Publications           |      |
| 5. | Mala<br>Dharmalingam  | Textbook of Endocrinology | Jaypee<br>Publications | 2010 |

#### RENCE BOOKS:

| S.No | Authors                         | Title   | Publishers   | Year of Publication |
|------|---------------------------------|---|--|---------------------|
| 1.   | Haris, G.W. and B.T. Donovan    | The Pituitary Gland   | S. Chand and Co.   | 1968                |
| 2.   | Bentley, P.J                    | Comparative vertebrate endocrinology                          | Cambridge University Press. Cambridge                          | 1985                |
| 3.   | Turner, C.D. and J.T. Bangara   | General endocrinology Saunders International Student edition. | Toppan Company Limited. Tokyo                                  | 1986                |
| 4.   | Ingleton, P.M. and J.T. Bangara | Fundamentals of comparative vertebrate endocrinology          | Kluwer Academic Publishers.                                    | 1986                |
| 5.   | Mac Hadley                      | Endocrinology, 3 <sup>rd</sup> Edition                        | A Simon & Schuster Company, Englewood Cliffs, New Jersey. USA. | 1992                |

#### WEB SOURCES:

[www.sciencemag.com](http://www.sciencemag.com)

[www.treehugger.com](http://www.treehugger.com)

[www.nature.com](http://www.nature.com)

#### TEACHING METHODOLOGY

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- Assignments
- Discussions
- Home test

- PPT Presentations
- Demonstration from the Video slides, videos and interactive software.

### **SYLLABUS DESIGNERS**

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Dr. K. Suganthi, Assistant Professor

Dr. S. Vijayakumari, Assistant Professor.

### **PRACTICAL -1**

#### **LIFE AND DIVERSITY OF INVERTEBRATES AND CHORDATES**

| Semester | Subject Code | Category         | Practical |                      | Theory | Practical | Credit |
|----------|--------------|------------------|-----------|----------------------|--------|-----------|--------|
|          |              |                  | Hrs/week  | Total Hours/Semester |        |           |        |
| I        |              | Core Practical-I | 4         | 60                   | Nil    | 60        | 5      |

### **OBJECTIVES:**

- To identify and study of selected Protozoans
- To understand the evolution /different types of coelom.
- To dissect and mount the digestive system of insects
- To Study of the specimens and their adaptive features for their respective modes of life
- To Study of the skull types with reference to jaw suspensions

### **INVERTEBRATA**

**(75 Hrs)**

#### **MEDICAL IMPORTANCE**

Identification and study of selected Protozoans (*Entamoeba histolytica*, *Plasmodium vivax*) and Helminthes (*Taenia solium*)

Different Types of Coelom

Identification and study of sections of available animals from Cnidaria (Hydra), Aschelminthes (*Ascaris lumbricoides*- Male and Female) and Annelida (Nereis)  
Identification and study of larval forms forms (Crustaceans and Echinoderms) of major phyla of Invertebrates.

**Major dissection**

Dissection of digestive system of insect (Cockroach), Sepia.

Dissection of nervous system of Prawn, insect (Cockroach), and Sepia.

Dissection of reproductive system of insect (Cockroach)

**Mounting of mouth parts** of Honey bee, Housefly, Mosquito

Appendages of Prawn

Sting apparatus of Honeybee

Radula of Phyla

**Study of prepared slides** - mouthparts of bug and Butterfly to relate their structure and function.

**CHORDATA****(45 Hrs)**

**To study of the following specimen to bring out their affinities:**

- a. Amphioxus
- b. Balanoglossus
- c. Ascidian

**To study of the following specimens with reference to their adaptive features for their respective modes of life**

- d. Echineis
- e. Ichthyophis / Uraeotyphlus
- f. Hyla
- g. Draco
- h. Pigeon
- i. Bat

**To study of the following skull types with reference to jaw suspensions**

- j. Fish
- k. Frog
- l. Calotes
- m. Snake
- n. Rat/Rabbit

**Dissection and mounting**

Webberian ossicles in Cat fish.

Aortic arches in Teleost

IXth and Xth Cranial nerves of Cat fish.

## **PRACTICAL -2**

### **CELL AND MOLECULAR BIOLOGY, GENETICS, BIOTECHNOLOGY AND BIOINFORMATICS**

| <b>Semester</b> | <b>Subject Code</b> | <b>Category</b>   | <b>Practical</b> |                             | <b>Theory</b> | <b>Practical</b> | <b>Credit</b> |
|-----------------|---------------------|-------------------|------------------|-----------------------------|---------------|------------------|---------------|
|                 |                     |                   | <b>Hrs/week</b>  | <b>Total Hours/Semester</b> |               |                  |               |
| I               |                     | Core Practical-II | 4                | 60                          | Nil           | 60               | 5             |

#### **OBJECTIVES:**

- To measure using ocular and stage micrometers of cell from any prepared slide.
- To understand the culture of Drosophila, Sex identification. Identification of blood groups A, B, ABO and Rh
- To observe the demonstration of principle and application of Tissue culture techniques.
- To understand and interpretation of Biological data bases.

### **CELL AND MOLECULAR BIOLOGY**

**(35 Hrs)**

#### **CYTOLOGICAL TECHNIQUES**

Micrometry – measurements using ocular and stage micrometers – measurements of cell from any prepared slide.

Vital staining – Buccal smear stained with Methylene blue.

#### **CHROMOSOME**

Chromosome preparation – procedure. Preparation of meiotic chromosomes from any fish – (demonstration)

#### **MOLECULAR BIOLOGY TECHNIQUES (Demonstration only)**

Centrifuge, Isolation of DNA from Liver – Isolation of RNA – Denaturation of DNA – measurement of spectrophotometry – Isolation and analysis of proteins – electrophoresis

**GENETICS****(20 Hrs)**

1. Preparation of culture medium Culture of *Drosophila*. Methods of maintenance. Sex identification. Identification of four mutants.
2. Identification of blood groups A,B, ABO and Rh.
3. Mounting of salivary glands of *Drosophila* larva or *Chironomus* larva. Analysis of banding pattern
4. Karyotyping using human metaphase chromosome plates (Giemsa stained). Eye Karyotyping, Identification of syndromes (Down, Klinefelter and Turner) from Karyotype Photographs showing clinical features of each syndrome case.

**BIOTECHNOLOGY****(20****Hrs)**

Visit to Biotechnology Laboratory to observe the demonstration of principle and application of

1. Tissue culture.
2. Titration and preparation of virulent phage.
3. Isolation of DNA from the plasmids.
4. Restriction enzymes digestion of DNA.
5. DNA electrophoresis in Agarose gel.
6. PCR

Necessary books may be referred to learn the techniques and to be recorded in the record Note books. Observation of photographs of different instruments used in Biotechnology, their principles and applications.

**BIOINFORMATICS****(20****Hrs)****1. Biological data bases**

- a) Nucleotide sequence data base
- b) Protein sequence data base
- c) Structural data bases (NDB, PDB).

**2. Sequence analysis**

- a) Pairwise sequence alignment
- b) Multiple sequence alignment
- c) Similarity search
- d) File format conversion



### 3. Protein structure prediction

Primary structure prediction

Secondary structure prediction

Tertiary structure prediction

Function prediction

### PRACTICAL -3

#### ENVIRONMENTAL BIOLOGY AND EVOLUTION

| Semester | Subject Code | Category           | Practical |                      | Theory | Practical | Credit |
|----------|--------------|--------------------|-----------|----------------------|--------|-----------|--------|
|          |              |                    | Hrs/week  | Total Hours/Semester |        |           |        |
| I        |              | Core Practical-III | 4         | 60                   | Nil    | 60        | 5      |

#### OBJECTIVES:

- Isolation and identification of Plankton (Freshwater).
- To understand the mechanisms and factors involving in aquatic system
- To study the interaction and adaptation among species

#### ENVIRONMENTAL BIOLOGY

(65 Hrs)

1. Estimation of Aquatic - Primary productivity - Dark and Light bottle.
2. Estimation of Dissolved oxygen, Salinity, Nitrites, Phosphates, Calcium, Silicates and Alkalinity in water samples.
3. Analysis of Industrial effluent - TDS, TSS, BOD, (COD - Demonstration).
4. Collection, isolation and identification of Plankton (Freshwater).
5. Study of sandy, muddy and rocky shore fauna with special reference to the adaptation to the environment (any FOUR).
6. Animal Association - parasitism, mutualism and commensalisms (any ONE/TWO)
7. Visit to:-
  - a). Drinking water treatment plant.
  - b). Effluent treatment plant
  - c). Sewage treatment plant.
  - d). Sandy, Muddy and Rocky Shores.

#### SYLLABUS DESIGNERS

Dr. K. Devi, HOD & Associate Professor.

Dr. K. Suganthi, Assistant Professor.

Dr. S. Vijayakumari, Assistant Professor.

## **DEPARMENT OF BIOCHEMISTRY-UG**

### **B.Sc Biochemistry**

#### **PROGRAM OBJECTIVE**

**PEO1:** To introduce students a solid foundation in biology and chemistry, develop analytical and critical-thinking skills.

**PEO2:** To use modern laboratory skills and apparatus to implement experimental protocols that allows independent exploration of biological phenomena through the scientific method.

#### **PROGRAME OUTCOME**

**PO1.** Students gain knowledge about the structural-functional relationships of proteins, lipids, nucleic acids, and carbohydrates and their role in metabolic pathways.

**PO2.** Course prepares the students to participate in independent research.

**PO3.** The tools used in analytical biochemistry will help the students to improve their potential applications in medical science.

**PO4.** Students will be able to analyze, plan current biochemical and molecular techniques to generate and test hypotheses, using statistical methods from experimental data.

**PO5.** Students in the Biochemistry major will be able to apply and effectively communicate scientific reasoning and data analysis in both written and oral forums.

**PO6.** Students in the Biochemistry major will understand and practice the ethics surrounding scientific research.

## DEPARTMENT OF BIOCHEMISTRY (UG)

| S. No. | Part | Study Components |             | Ins. Hrs/ Week | Credit | Title of the Paper                   | Max. Marks |       |     |
|--------|------|------------------|-------------|----------------|--------|--------------------------------------|------------|-------|-----|
|        |      | Course Title     |             |                |        |                                      | CIA        | Sem . | Tot |
|        |      | SEMESTER I       |             |                |        |                                      |            |       |     |
| 1.     | I    | Language         | Paper I     | 6              | 4      | Tamil –I                             | 25         | 75    | 100 |
| 2.     | II   | English          | Paper I     | 6              | 4      | English –I                           | 25         | 75    | 100 |
| 3.     | III  | Core             | Paper I     | 6              | 5      | Cell Biology                         | 25         | 75    | 100 |
| 4.     | III  | Core             | Practical I | 3              | 0      | Cell biology & Bioorganic Chemistry  | 0          | 0     | 0   |
| 5.     | III  | Allied           | Paper I     | 4              | 4      | Chemistry-I                          | 25         | 75    | 100 |
| 6.     | III  | Allied           | Practical I | 3              | 0      | Chemistry Practical                  | 0          | 0     | 0   |
| 7.     | IV   | EVS              |             | 2              | 2      | Environmental Studies                | 25         | 75    | 100 |
|        |      |                  |             | 30             | 19     |                                      | 125        | 375   | 500 |
|        |      | SEMESTER II      |             |                |        |                                      | CIA        | Sem   | Tot |
| 8.     | I    | Language         | Paper II    | 6              | 4      | Tamil paper II                       | 25         | 75    | 100 |
| 9.     | II   | English          | Paper II    | 4              | 4      | English paper II                     | 25         | 75    | 100 |
| 10.    | III  | Core             | Paper II    | 5              | 5      | Bio-Organic Chemistry                | 25         | 75    | 100 |
| 11.    | III  | Core             | Practical I | 3              | 3      | Cell biology & Bio-organic Chemistry | 40         | 60    | 100 |
| 12.    | III  | Allied           | Paper II    | 4              | 4      | Chemistry-II                         | 25         | 75    | 100 |
| 13.    | III  | Allied           | Practical I | 3              | 2      | Chemistry Practical                  | 40         | 60    | 100 |
| 14.    | IV   | Value educatio   |             | 2              | 2      | Value Education (Gen Awareness)      | -          | 50    | 50  |

|     |    |            |  |           |           |            |     |     |     |
|-----|----|------------|--|-----------|-----------|------------|-----|-----|-----|
| 15. | IV | Soft skill |  | 2         | 1         | Soft skill | -   | 50  | 50  |
|     |    |            |  | <b>30</b> | <b>25</b> |            | 180 | 520 | 700 |

| S.No . | Part | Study Components     |              | Ins. Hrs / Week | Credit | Title of the Paper                               | Max. Marks |       |     |
|--------|------|----------------------|--------------|-----------------|--------|--|------------|-------|-----|
|        |      | Course Title         |              |                 |        |  |            |       |     |
|        |      | SEMESTER III         |              |                 |        |  | CIA        | Sem . | Tot |
| 16.    | I    | Language             | Paper III    | 6               | 4      | Tamil –III                                       | 25         | 75    | 100 |
| 17.    | II   | English              | Paper III    | 6               | 4      | English -III                                     | 25         | 75    | 100 |
| 18.    | III  | Core                 | Paper III    | 4               | 4      | Analytical Techniques-I                          | 25         | 75    | 100 |
| 19.    | III  | Core                 | Practical II | 3               | 0      | Analytical Techniques & Biochemical Preparations | 0          | 0     | 0   |
| 20.    | III  | Allied               | Paper III    | 4               | 4      | Microbiology I                                   | 25         | 75    | 100 |
| 21.    | III  | Allied               | Practical II | 3               | 0      | Microbiology Practical                           | 0          | 0     | 0   |
| 22.    | IV   | Skill Based I        | Paper I      | 2               | 2      | Medical Laboratory Technology – I                |            | 50    | 50  |
| 23.    | IV   | Non Major Elective I | Paper I      | 2               | 2      | Diagnostic Biochemistry I                        |            | 50    | 50  |
|        |      |                      |              | 30              | 20     |  | 200        | 300   | 500 |
|        |      |                      |              |                 |        |  |            |       |     |
|        |      | SEMESTER IV          |              |                 |        |  | CIA        | Sem . | Tot |
| 24.    | I    | Language             | Paper IV     | 6               | 4      | Tamil paper -IV                                  | 25         | 75    | 100 |
| 25.    | II   | English              | Paper IV     | 6               | 4      | English –IV                                      | 25         | 75    | 100 |

|     |     |                       |           |           |           |  |            |            |            |
|-----|-----|-----------------------|-----------|-----------|-----------|--|------------|------------|------------|
| 26. | III | Core                  | Paper IV  | 4         | 4         | Analytical Techniques-II                         | 25         | 75         | 100        |
| 27. | III | Core                  | Practical | 3         | 3         | Analytical Techniques & Biochemical Preparations | 40         | 60         | 100        |
| 28. | III | Allied                | Paper IV  | 4         | 4         | Microbiology II                                  | 25         | 75         | 100        |
| 29. | III | Allied                | Practical | 3         | 2         | Microbiology Practical                           | 40         | 60         | 100        |
| 30. | IV  | Skill Based II        | Paper II  | 2         | 2         | Medical Laboratory Technology – II               |            | 50         | 50         |
| 31. | IV  | Non Major Elective II | Paper II  | 2         | 2         | Diagnostic Biochemistry II                       |            | 50         | 50         |
|     |     |                       |           | <b>30</b> | <b>25</b> |  | <b>180</b> | <b>520</b> | <b>700</b> |

| S. No. | Part | Study Components |               | Ins. Hrs/ Week | Credit | Title of the Paper                         | Max. Marks |      |     |
|--------|------|------------------|---------------|----------------|--------|--|------------|------|-----|
|        |      | Course Title     |               |                |        |  | CIA        | Sem. | Tot |
|        |      | SEMESTER V       |               |                |        |  |            |      |     |
|        | III  | Core             | Paper V       | 5              | 5      | Enzymes & Enzyme Techniques                | 25         | 75   | 100 |
|        | III  | Core             | Paper VI      | 4              | 4      | Human Physiology                           | 25         | 75   | 100 |
|        | III  | Core             | Paper VII     | 4              | 4      | Genetics & Molecular Biology               | 25         | 75   | 100 |
|        | III  | Core             | Practical III | 5              | 0      | Colorimetric Estimations & Enzyme kinetics | 0          | 0    | 0   |

|  |     |                 |              |           |           |                                     |     |     |     |
|--|-----|-----------------|--------------|-----------|-----------|-------------------------------------|-----|-----|-----|
|  | III | Core            | Practical IV | 4         | 0         | Hematology and Urine analysis       | 0   | 0   | 0   |
|  | III | Elective I      | Paper I      | 3         | 3         | Biostatistics                       | 25  | 75  | 100 |
|  | III | Elective II     | Paper II     | 3         | 3         | Hormonal Biochemistry               | 25  | 75  | 100 |
|  | IV  | Skill Based III | Paper III    | 2         | 2         | Applications of Computer in Biology | 0   | 50  | 50  |
|  |     |                 |              | <b>30</b> | <b>21</b> |                                     | 125 | 425 | 550 |
|  |     |                 |              |           |           |                                     |     |     |     |

|  |     | <b>SEMESTER VI</b> |               |           |           |  | <b>CIA</b> | <b>Sem.</b> | <b>Tot</b> |
|--|-----|--------------------|---------------|-----------|-----------|--|------------|-------------|------------|
|  | III | Core               | Paper VIII    | 5         | 5         | Nutritional Plant Biochemistry             | 25         | 75          | 100        |
|  | III | Core               | Paper IX      | 4         | 4         | Intermediary Metabolism                    | 25         | 75          | 100        |
|  | III | Core               | Paper X       | 4         | 4         | Biotechnology                              | 25         | 75          | 100        |
|  | III | Core               | Practical III | 5         | 3         | Colorimetric Estimations & Enzyme Kinetics | 40         | 60          | 100        |
|  | III | Core               | Practical IV  | 4         | 3         | Hematology and Urine analysis              | 40         | 60          | 100        |
|  | III | Elective III       | Paper III     | 3         | 3         | Immunology                                 | 25         | 75          | 100        |
|  | III | Elective IV        | Paper IV      | 3         | 3         | Clinical Biochemistry                      | 25         | 75          | 100        |
|  | IV  | Skill Based IV     | Paper IV      | 2         | 2         | Bioinformatics                             | 0          | 50          | 50         |
|  | V   |                    |               |           | 3         | Extension Activity                         | 100        | 0           | 100        |
|  |     |                    |               | <b>30</b> | <b>30</b> |  | 305        | 545         | 850        |

**CONSOLIDATED STATEMENT**

| Part     | Subject               | Papers    | Credit | Total credits | Marks | Total marks |
|----------|-----------------------|-----------|--------|---------------|-------|-------------|
| Part I   | Languages             | 4         | 4      | 16            | 100   | 400         |
| Part II  | English               | 4         | 4      | 16            | 100   | 400         |
| Part III | Allied (Odd Sem)      | 2         | 4      | 8             | 100   | 200         |
|          | Allied (Even Sem)     | 2         | 4      | 8             | 100   | 200         |
|          | Allied Prac(Even Sem) | 2         | 2      | 4             | 100   | 200         |
|          | Electives             | 4         | 3      | 12            | 100   | 400         |
|          | Core                  | 10        | 4-5    | 44            | 100   | 1000        |
|          | Core practical        | 4         | 3      | 12            | 100   | 400         |
| Part IV  | Env. Science          | 1         | 2      | 2             | 100   | 100         |
|          | Soft skill            | 1         | 1      | 1             | 50    | 50          |
|          | Value Education       | 1         | 2      | 2             | 50    | 50          |
|          | Non major             | 2         | 2      | 4             | 50    | 100         |
|          | Skill based           | 4         | 2      | 8             | 50    | 200         |
| Part V   | Extension Activity    | 1         | 3      | 3             | 100   | 100         |
|          | <b>Total</b>          | <b>42</b> |        | <b>140</b>    |       | <b>3800</b> |

**CELL BIOLOGY**

| Sem | Subject Code | Category | Lecture   |           | Theory    |           | Practical |           | Credits |
|-----|--------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
|     |              |          | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. |         |
| I   |              | Core     | 6         | 90        | 6         | 90        | -         | -         | 5       |

**COURSE OBJECTIVE:**

To enable the students to get themselves aware on how different tissue types are combined to form organs and how the organs function which follows from the structure and function of the constituent tissue.

**COURSE OUTCOMES:**

On the successful completion of the course, students will be able to –

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K<sub>1</sub> – K<sub>4</sub>)</b> |
|------------------|--|--|
| <b>CO1</b>       | To understand the relationship between prokaryotic and eukaryotic cells. | <b>K1</b>  |
| <b>CO2</b>       | To know the structure and functions of various cell organelles.          | <b>K2</b>  |
| <b>CO3</b>       | To gain knowledge about the membrane models and transport system         | <b>K2</b>  |
| <b>CO4</b>       | To learn about oncogenes, tumour progression and its prevention.         | <b>K3</b>  |
| <b>CO5</b>       | To understand the basic phases involved in cell cycle.                   | <b>K4</b>  |

(\*CO – Course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

#### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | S          | S          | M          | M          | M          |
| <b>CO2</b> | S          | M          | M          | S          | S          | M          |
| <b>CO3</b> | S          | S          | M          | S          | M          | S          |
| <b>CO4</b> | M          | M          | S          | S          | M          | S          |
| <b>CO5</b> | S          | S          | S          | M          | S          | S          |

(S- STRONG

M-MEDIUM

L-LOW)

**Total Hours : 90**

#### **UNIT – I**

##### **Introduction to cells and their organization**

**15 hrs**

An overview of cells – Origin and evolution of cells. Cell theory, cell as basic unit of life. Classification of cells –Prokaryotic cells and Eukaryotic cells. Comparison of prokaryotic and eukaryotic cells. Molecular composition of cells - Water, Carbohydrates, lipids, nucleic acids and proteins.

#### **UNIT-II**

##### **Structure and function of subcellular organelles**

**15 hrs**

Subcellular organelles: The ultra structure of cell wall, plasma membrane, nucleus, mitochondria, rough and smooth endoplasmic reticulum, Golgi apparatus, lysosome, peroxisome, chloroplast and glyoxisome and their function.

#### **UNIT-III**



**Membrane models and transport system****20 hrs**

Biomembrane – structure, organization and basic functions, fluid mosaic model, Transport across cell membrane – uniport, symport and antiport. Passive and active transport and ion channel.

**UNIT –IV****Types and functions of tissues****25 hrs**

Types of tissue, Characteristics of cancer, Properties of cancer cells, Tumour progression. Origin of cancer, types of cancer, causes of cancer, Diagnosis, Treatment, Oncogenes, Prevention of cancers.

**UNIT – V****Cell cycle and cell division****15 hrs**

The cell cycles- phases of cell cycle. Cell divisions, Amitosis, Mitosis, Significance of Mitosis, Meiosis – Heterotypic and Homotypic division. Significance of Meiosis. Comparison between Mitosis and Meiosis.

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems – Nil

**TEACHING METHODOLOGY:**

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

**TEXT BOOKS:**

| S.NO. | AUTHORS                  | TITLE                                    | PUBLISHERS                | YEAR OF PUBLICATION |
|-------|--------------------------|--|---------------------------|---------------------|
| 1.    | David Sadava and         | Cell biology and structure and functions | Jones Bartlett publishers | 2009                |
| 2.    | Lodish, Berk, Zipursky   | Molecular Cell Biology                   | Baltimore, Freeman.       | 2007                |
| 3.    | P.S. Verma, V.K. Agarwal | Cytology                                 | Chand Publications        | 2006                |
| 4.    | N.Arumugam               | Cell Biology                             | Saras Publications        | 2001                |

|    |                                |   |                                |      |
|----|--------------------------------|---|--------------------------------|------|
| 5. | David L. Nelson,<br>Michael M. | Lehninger Principles<br>of Biochemistry | Macmillan Worth<br>Publishers. | 1987 |
|----|--------------------------------|---|--------------------------------|------|

#### REFERENCE BOOKS:

| S. NO. | AUTHORS                                     | TITLE                      | PUBLISHERS                      | YEAR OF PUBLICATION |
|--------|---|----------------------------|---------------------------------|---------------------|
| 1.     | Karp, G.                                    | Cell and Molecular Biology | John Wiley & Sons. Inc.         | 2010                |
| 2.     | Bruce Alberts and Dennis Bray               | Essential Cell Biology     | Garland Science                 | 2013                |
| 3.     | De Robertis, E.D.P. and De Robertis, E.M.F. | Cell and Molecular Biology | Lippincott Williams and Wilkins | 2010                |

#### WEB SOURCES:

- [http://www.biology.arizona.edu/cell\\_bio/cell\\_bio.html](http://www.biology.arizona.edu/cell_bio/cell_bio.html)
- [https://ecok.libguides.com/biology/web\\_sources](https://ecok.libguides.com/biology/web_sources)
- <https://www.nicholls.edu/biol-ds/biol155/Lectures/Cell%20Biology.pdf>
- <http://www.bio-nica.info/Biblioteca/Bolsover2004CellBiology.pdf>

#### SYLLABUS DESIGNER:

- Dr.B.Hebsibah Elsie, Assistant Professor of Bio-Chemistry
- Mrs K.Shoba, Assistant Professor of Bio-Chemistry

### BIO – ORGANIC CHEMISTRY

| Sem | Subject Code | Category | Lecture   |           | Theory    |           | Practical |           | Credits |
|-----|--------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
|     |              |          | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. |         |
| II  |              | Core     | 5         | 75        | 5         | 75        | -         | -         | 5       |

#### COURSE OBJECTIVE:

To enable the students to learn the basic functions, structures and biological importance of biochemical compounds and also to understand the significance of the complex bio-molecules such as polysaccharides, lipids, proteins and nucleic acids.

**COURSE OUTCOMES:**

On the successful completion of the course, students will be able to -

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K<sub>1</sub> – K<sub>4</sub>)</b> |
|------------------|---|--|
| <b>CO1</b>       | To understand the structure, classification and functions of Carbohydrates  | <b>K1</b>  |
| <b>CO2</b>       | To understand the structure, classification, reactions of Amino acids   | <b>K2</b>  |
| <b>CO3</b>       | To gain the knowledge about structures, physical and chemical properties and biological importance of protein molecule. | <b>K2</b>  |
| <b>CO4</b>       | To understand the significance, structures, physical and chemical properties of lipids.                                 | <b>K3</b>  |
| <b>CO5</b>       | To gain basic knowledge about DNA and RNA.  | <b>K4</b>  |

(\*CO – Course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

**MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | S          | M          |
| <b>CO2</b> | S          | S          | M          | M          | S          | S          |
| <b>CO3</b> | M          | M          | M          | S          | M          | S          |
| <b>CO4</b> | S          | M          | S          | S          | M          | M          |
| <b>CO5</b> | M          | S          | S          | M          | S          | S          |

(S- STRONG

M-MEDIUM

L-LOW)

**Total Hours : 75**

**UNIT-I****Carbohydrates**

**[15 hrs]**

Definition and classification of carbohydrates, linear and cyclic forms (Haworth projection) for glucose, fructose and mannose and disaccharides (maltose, lactose, sucrose). General properties of monosaccharides and disaccharides. Occurrence, significance and structure of polysaccharides (Starch, glycogen and cellulose).

Reaction of Carbohydrates due to the presence of hydroxyl, aldehyde and ketone groups.

## **UNIT-II**

### **Amino acids**

**[10 hrs]**

Aminoacids- biological role. General structure of amino acids. 3- and 1-letter abbreviations. Classification of amino acids based on nature of R group (polar, non polar, acidic, basic, neutral). Physical properties of amino acids, isoelectric point, titration curve (alanine, lysine, glutamic acid), optical activity. Chemical reactions due to carboxyl group, amino group and side chains. Colour reactions of amino acids.

## **UNIT-III**

### **Proteins**

**[20 hrs]**

Introduction, classification based on solubility, shape, composition and function. Structure of proteins- primary, secondary, tertiary and quaternary, various forces involved- quaternary structure. Biological functions, physical properties- ampholytes, isoionic point, salting in and salting out, denaturation, nature of peptide bond. Biologically important peptides-structure and functions (esp. insulin, glutathione, vasopressin).

## **UNIT-IV**

### **Lipids**

**[15 hrs]**

Introduction, definition of fatty acids. Classification, nomenclatures, structures, properties of fatty acids (Essential Fatty Acids) Structure and function of prostaglandins, tri-acyl glycerol. Structure and functions of phospholipids (Lecithin, cephalin and phosphatidyl inositol), spingo myelin, plasmalogens. Structure and function of glycolipids, cholesterol. Characterization of fats – iodine value, saponification value, acid number, acetyl number, Polensky number, Reichert-Meissl number.

## **UNIT V**

### **Nucleic acids**

**[15 hrs]**

Nucleic acids - Definition, composition, nucleoside, nucleotide and polynucleotide. Double helical model of DNA. Properties of DNA. Structure of RNA, tRNA, mRNA and rRNA and its biological functions. Differences between DNA and RNA.

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems – Nil

**TEACHING METHODOLOGY:**

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

**TEXT BOOKS:**

| S. NO | AUTHORS                          | TITLE        | PUBLISHERS               | YEAR OF PUBLICATION |
|-------|----------------------------------|--------------|--------------------------|---------------------|
| 1.    | U.Satyanarayana,<br>U.Chakrapani | Biochemistry | Books and Allied (P) Ltd | 2010                |

**REFERENCE BOOKS:**

| S. NO | AUTHORS          | TITLE                        | PUBLISHERS                      | YEAR OF PUBLICATION |
|-------|------------------|------------------------------|---------------------------------|---------------------|
| 1.    | J L Jain         | Fundamentals of Biochemistry | S Chand                         | 2016                |
| 2.    | Anil Chandra Deb | Fundamentals of Biochemistry | New Central Book Agency (p) Ltd | 2001                |

**WEB SOURCES :**

- [https://en.wikibooks.org/wiki/Structural\\_Biochemistry/Organic\\_Chemistry/Carbohydrates](https://en.wikibooks.org/wiki/Structural_Biochemistry/Organic_Chemistry/Carbohydrates)
- <http://themedicalbiochemistrypage.org/carbohydrates.html>
- [https://en.wikibooks.org/wiki/Category:Book:Structural\\_Biochemistry](https://en.wikibooks.org/wiki/Category:Book:Structural_Biochemistry)

**SYLLABUS DESIGNER:**

- Dr.B.Hebsibah Elsie, Assistant Professor of Bio-Chemistry
- Mrs.K.Shoba, Assistant Professor of Bio-Chemistry

**I YEAR - MAIN PRACTICAL – I****CELL BIOLOGY & BIO-ORGANIC CHEMISTRY**

| Sem | Sub. Code | Category | Lecture   |          | Theory    |       | Practical |          | Credits |
|-----|-----------|----------|-----------|----------|-----------|-------|-----------|----------|---------|
|     |           |          | Hrs/ week | Hrs/ sem | Hrs/ week | Hrs / | Hrs/ Week | Hrs/ sem |         |

|    |  |            |   |   |   |            |   |    |   |
|----|--|------------|---|---|---|------------|---|----|---|
|    |  |            |   | . |   | <b>sem</b> |   | .  |   |
| II |  | Practicals | - | - | - | -          | 3 | 45 | 3 |

## CELL BIOLOGY

1. Study of mitotic division using onion root tip
2. Microscopic structure of cell organelles
3. Study of slides and spotters relevant to the type studied in theory.

## BIO- ORGANIC CHEMISTRY

### 1.VOLUMETRIC ESTIMATION

1. Estimation of Glucose by Benedict's method
2. Estimation of Glycine by formal titration
3. Estimation of Ascorbic acid
4. Determination of saponification value of an edible oil
5. Iodine value of an oil
6. Acid number

### 2. QUALITATIVE ANALYSIS OF BIOMOLECULES:

1. Analysis of Carbohydrates (Glucose, fructose, xylose, galactose, sucrose , maltose, lactose and starch).
2. Analysis of Amino acids (Histidine, tyrosine, tryptophan, cysteine, arginine, methionine)
3. Test for Proteins
4. Test for lipids

## TEXT BOOKS

| S. NO | AUTHORS       | TITLE   | PUBLISHERS                         | YEAR OF PUBLICATION |
|-------|---------------|---|------------------------------------|---------------------|
| 1.    | Ranjna Chawla | Practical Clinical Biochemistry Methods and Interpretations | Jaypee Brothers Medical Publishers | 2014                |

|    |                    |                                   |                                    |      |
|----|--------------------|-----------------------------------|------------------------------------|------|
| 2. | Harold Varley      | Practical Clinical Biochemistry   | CBS                                | 2005 |
| 3. | Damodaran Geetha K | Practical biochemistry            | Jaypee Brothers Medical Publishers | 2016 |
| 4. | J.Jayaraman        | Laboratory Manual in Biochemistry | New age International publishers   | 2011 |
| 5. | Ramnik Sood        | Medical laboratory Technology     | Jaypee                             | 2006 |

#### **SYLLABUS DESIGNER:**

- Dr.B.Hebsibah Elsie, Assistant Professor of Bio-Chemistry
- Mrs.K.Shoba, Assistant Professor of Bio-Chemistry

#### **ALLIED BIOCHEMISTRY- I**

| Sem | Subject Code | Category | Lecture   |           | Theory    |           | Practical |           | Credits |
|-----|--------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
|     |              |          | Hrs/ week | Hrs / sem | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. |         |
| II  |              | Allied   | 4         | 60        | 4         | 60        | -         | -         | 4       |

#### **COURSE OBJECTIVE:**

To enable the students to learn and comprehend the structure, properties and functions of biomolecules.

#### **COURSE OUTCOMES:**

On the successful completion of the course, students will be able to -

| CO Number | CO Statement  | Knowledge Level (K <sub>1</sub> – K <sub>4</sub> ) |
|-----------|---|--|
| CO1       | Understand and relate the carbohydrate, its types, structure and properties | K2   |
| CO2       | Students will analyze structural-functional                                 | K4   |

|     |  |    |
|-----|--|----|
|     | relationships of aminoacids  |    |
| CO3 | Provides a clear knowledge on the different levels of protein structure and their interdependence                      | K2 |
| CO4 | Provide an understanding of characteristics for each type of lipid and several major functions of lipids.              | K4 |
| CO5 | Understand the composition and roles of <i>nucleic acids</i> in the cell and distinguish between its different types . | K1 |

(\*CO – Course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

### MAPPING WITH PROGRAMME OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | M   | S   | M   |
| CO2 | S   | S   | M   | M   | S   | S   |
| CO3 | M   | M   | M   | S   | M   | S   |
| CO4 | S   | M   | S   | S   | M   | M   |
| CO5 | M   | S   | S   | M   | S   | S   |

(S- STRONG

M-MEDIUM

L-LOW)

### UNIT I

**Total Hours :60**

#### Chemistry of Carbohydrates

**[15 hrs]**

Classification of carbohydrates, Monosaccharides : Linear and ring forms of Glucose and Fructose, Mutarotation. Disaccharides: occurrence, structure, physical properties of Maltose, Sucrose and Lactose. Polysaccharides: Starch and Cellulose - Occurrence, structure, physical properties.

### UNIT II

#### Chemistry of Aminoacids

**[10 hrs]**

Amino acids -Definition, General structure of amino acids, classification of amino acids, physical properties of amino acids, Isoelectric point, Isoelectric pH and Zwitter ion. Chemical properties- Reaction with Ninhydrin, 1-Fluoro-2, 4-dinitrobenzene (FDNB) reaction

### UNIT III

#### Chemistry of Proteins

**[15 hrs]**

Classification of proteins based on solubility, size and shape, Peptide bond - Formation of peptide bond, Physical properties of proteins - Salting in and Salting out,



Denaturation and renaturation of proteins, Structure of protein: primary, secondary, tertiary and quaternary levels of organization.

#### **UNIT IV**

##### **Chemistry of Lipids**

**[10 hrs]**

Definition, classification and functions of lipid, Fatty acids- Saturated fatty acids: Butyric, arachidic and stearic acid. Unsaturated fatty acids: Oleic, Linoleic and linolenic acid. cholesterol- structure and biological significance. Structure and functions of phospholipids-sphingomyelin. Characterization of fat- Emulsification, Saponification, Acid number, Rancidity, Iodine number and Reichert- Meissl number. Bile acid, Bile salt and its functions.

#### **UNIT V**

##### **Chemistry of Nucleic acids**

**[10 hrs]**

Nucleic acids - Definition, composition, nucleoside, nucleotide and polynucleotide. Double helical model of DNA. Structure of RNA: tRNA, mRNA and rRNA and its biological functions. Differences between DNA and RNA.

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems – Nil

##### **TEACHING METHODOLOGY:**

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

##### **TEXT BOOKS:**

| <b>S.NO</b> | <b>AUTHORS</b>                   | <b>TITLE</b> | <b>PUBLISHERS</b>           | <b>YEAR OF PUBLICATION</b> |
|-------------|----------------------------------|--------------|-----------------------------|----------------------------|
| 1.          | U.Satyanarayana,<br>U.Chakrapani | Biochemistry | Books and<br>Allied (P) Ltd | 2010                       |

##### **REFERENCE BOOKS:**

| <b>S.NO</b> | <b>AUTHORS</b> | <b>TITLE</b>                    | <b>PUBLISHERS</b> | <b>YEAR OF PUBLICATION</b> |
|-------------|----------------|---------------------------------|-------------------|----------------------------|
| 1.          | J. L. Jain     | Fundamentals of<br>Biochemistry | S Chand           | 2016                       |

|    |                                |                                      |  |      |
|----|--------------------------------|--------------------------------------|--|------|
| 2. | Anil Chandra Deb               | Fundamentals of Biochemistry         | New Central Book Agency (p) Ltd                        | 2001 |
| 3. | David L. Nelson<br>Michael Cox | Lehninger Principles of Biochemistry | Cox-CBS Publishers                                     | 2017 |
| 4. | Murray R K                     | Harper's illustrated Biochemistry    | P.A. Mayes and U.W.Rodwell -Lange Medical publications | 2006 |
| 5. | Chatterjee                     | Textbook of Medical Biochemistry     | Jaypee Brothers Medical Publishers (P) Ltd             | 2012 |

#### WEB SOURCES:

- [https://en.wikibooks.org/wiki/Structural\\_Biochemistry/Organic\\_Chemistry/Carbohydrates](https://en.wikibooks.org/wiki/Structural_Biochemistry/Organic_Chemistry/Carbohydrates)
- <http://themedicalbiochemistrypage.org/carbohydrates.html>
- [https://en.wikibooks.org/wiki/Category:Book:Structural\\_Biochemistry](https://en.wikibooks.org/wiki/Category:Book:Structural_Biochemistry)

#### SYLLABUS DESIGNER:

- Ms.T.Nalini, Assistant Professor of Bio-Chemistry
- Mrs.G.Nithya, Assistant Professor of Bio-Chemistry

#### ALLIED BIOCHEMISTRY- II

| Sem | Sub Code | Category | Lecture   |           | Theory    |           | Practical |           | Credits |
|-----|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
|     |          |          | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. |         |
| II  |          | Allied   | 4         | 60        | 4         | 60        | -         | -         | 4       |

#### COURSE OBJECTIVE:

To enable the students to learn metabolism and metabolic disorders, structure and biological functions of enzymes, vitamins and minerals.

#### COURSE OUTCOMES:

On the successful completion of the course, students will be able to –

| <b>CO Number</b> | <b>CO statement</b>  | <b>Knowledge level (K1-k4)</b> |
|------------------|--|--------------------------------|
| CO1              | Provides a deeper insight into the fundamentals of metabolism and various metabolic reactions.   | <b>K1</b>                      |
| CO2              | Students will assess and apply the knowledge of applications of the instruments commonly used in the laboratories.                       | <b>K4</b>                      |
| CO3              | Students will acquire knowledge on the role and the mechanisms of action of enzymes.   | <b>K2</b>                      |
| CO4              | Provide an understanding of characteristics for each type of lipid and several major functions of lipids.                                | <b>K2</b>                      |
| CO5              | Understand the potential benefits and role of vitamins, minerals and their major functions and distinguish between its different types . | <b>K3</b>                      |

(\*CO – course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

#### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | S          | M          |
| <b>CO2</b> | S          | S          | M          | M          | S          | S          |
| <b>CO3</b> | M          | M          | M          | S          | M          | S          |
| <b>CO4</b> | S          | M          | S          | S          | M          | M          |
| <b>CO5</b> | M          | S          | S          | M          | S          | S          |

(S- STRONG

M-MEDIUM

L-LOW)

#### **UNIT I**

**Total Hours: 60**

##### **Metabolism**

**[15 hrs]**

Metabolism - Definition, Types of metabolic pathways-catabolism, anabolism and amphibolism with example. Glycolysis-pathway, Fate of pyruvate under aerobic and anaerobic conditions, TCA cycle, Transamination reaction, significance of SGOT and SGPT.

#### **UNIT II**

##### **Analytical Techniques**

**[10hrs]**

Units of measurement of solutes in solution-normality, molality, molarity, Isotonic, hypertonic and hypotonic solutions, Osmosis, Osmotic pressure, Applications of Osmosis, Definition - pH, pOH, buffer and buffer capacity, Buffers in body fluids,

Henderson Hesselbalch equation. Paper chromatography, Gel permeation chromatography - Principle and applications.

### **UNIT III**

#### **Enzymes**

**[10 hrs]**

Enzymes - Definition, enzyme units, Active site, Nomenclature and Classification of enzymes. Mechanism of enzyme action - Lock and key theory, Induced fit theory. Factors affecting enzyme activity: pH, Temperature and Substrate concentration. Isoenzyme: Definition with one example (LDH), Michaleis- Menton equation. Enzyme Inhibition: Competitive, Uncompetitive, and Non competitive inhibition.

### **UNIT IV**

#### **Molecular Biology**

**[15 hrs]**

Central dogma, Replication: Definition, Types- Semiconservative replication, Protein synthesis- Initiation, Elongation and Termination. Genetic code - Definition, characteristics of genetic code, DNA as genetic material - Experimental evidence- Griffith, Avery, Hershey-chase experiments.

### **UNIT V**

#### **Vitamins and Minerals**

**[10 hrs]**

Vitamins - Classification, sources, and biological functions, Minerals: Essential macro minerals and essential micro minerals, sources and functions (Iron, copper, Potassium, Phosphorous, Calcium).

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems – Nil

#### **TEACHING METHODOLOGY:**

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

**TEXT BOOKS:**

| S. NO | AUTHORS                          | TITLE        | PUBLISHERS               | YEAR OF PUBLICATION |
|-------|----------------------------------|--------------|--------------------------|---------------------|
| 1.    | U.Satyanarayana,<br>U.Chakrapani | Biochemistry | Books and Allied (P) Ltd | 2010                |

**REFERENCE BOOKS:**

| S. NO | AUTHORS                                | TITLE   | PUBLISHERS   | YEAR OF PUBLICATION |
|-------|--|---|--|---------------------|
| 1.    | Murray R K                             | Harper's illustrated Biochemistry               | P.A. Mayes and U.W.Rodwell -Lange Medical publications | 2006                |
| 2.    | Nicholas C. Price and Lewis Stevens    | Fundamental of Enzymology                       | Oxford University Press                                | 1999                |
| 3.    | David L. Nelson Michael Cox            | Lehninger Principles of Biochemistry            | Cox-CBS Publishers                                     | 2017                |
| 4.    | Chatterjee                             | Textbook of Medical Biochemistry                | Jaypee brothers medical Publishers (p) Ltd             | 2012                |
| 5.    | Avinash Upadhyaye and Nirmalendhe Nath | Biophysical chemistry Principles and Techniques | Himalaya Publishers                                    | 2009                |

**WEB SOURCES:**

- <https://en.wikibooks.org/wiki/Category:Book:Biochemistry>
- [https://en.wikipedia.org/wiki/Nucleic\\_acid\\_structure](https://en.wikipedia.org/wiki/Nucleic_acid_structure)
- <https://www.helpguide.org/harvard/vitamins-and-minerals.htm>

**SYLLABUS DESIGNER:**

- Ms.T.Nalini, Assistant Professor of Bio-Chemistry
- Mrs.G.Nithya, Assistant Professor of Bio-Chemistry

**ALLIED PRACTICAL I**

| Sem | Sub. Code | Category   | Lecture   |           | Theory    |           | Practical |           | Credits |
|-----|-----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
|     |           |            | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. |         |
| II  |           | Practicals | -         | -         | -         | -         | 3         | 45        | 2       |

**VOLUMETRIC ESTIMATION**

1. Estimation of HCl using suitable bases.
2. Estimation of Iron in Ferrous Ammonium Sulphate using potassium permanganate as  
link solution.
3. Estimation of Glucose by Benedict's method
4. Estimation of Glycine by formal titration
5. Estimation of Ascorbic acid

**QUALITATIVE ANALYSIS**

1. Carbohydrates: Glucose, Fructose, Galactose, Sucrose, Maltose, Lactose and Xylose
2. Aminoacids: Arginine, Cysteine, Tryptophan and Tyrosine.

**COLORIMETRIC ANALYSIS** (Only for demonstration)

1. Estimation of Protein by Biuret method.
2. Estimation of DNA using diphenylamine.
3. Estimation of Glucose by O-Toluidine.

### TEXT BOOKS

| S. NO | AUTHORS            | TITLE   | PUBLISHERS                         | YEAR OF PUBLICATION |
|-------|--------------------|---|------------------------------------|---------------------|
| 1.    | Ranjna Chawla      | Practical Clinical Biochemistry Methods and Interpretations | Jaypee Brothers Medical Publishers | 2014                |
| 2.    | Harold Varley      | Practical Clinical Biochemistry                             | CBS                                | 2005                |
| 3.    | Damodaran Geetha K | Practical biochemistry                                      | Jaypee Brothers Medical Publishers | 2016                |
| 4.    | J.Jayaraman        | Laboratory Manual in Biochemistry                           | New age International publishers   | 2011                |
| 5.    | Ramnik Sood        | Medical laboratory Technology                               | Jaypee                             | 2006                |

### SYLLABUS DESIGNER:

- Ms.T.Nalini, Assistant Professor of Bio-Chemistry
- Mrs.G.Nithya, Assistant Professor of Bio-Chemistry

## DEPARTMENT OF BIOCHEMISTRY-PG

### M.Sc Biochemistry

#### PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

**PEO<sub>1</sub>** : To train students with good scientific and technical knowledge so as to comprehend, analyze, design, and create novel products and solutions for developing novel therapeutics.

**PEO<sub>2</sub>** : To enable the student to develop good communication and leadership skills, respect for authority, loyalty and the life-long learning needed for a successful scientific and professional career.

#### PROGRAMME OUTCOMES (POs):

On successful completion of the Masters in Biochemistry graduates will be able to

**PO1.** Acquire in depth knowledge of Biological science and Bioengineering for gaining ability to develop and evaluate new ideas

**P02.** Demonstrate scientific and technological skills to design and perform research through modern techniques for the development of high throughput process and products.

**P03.** Analyze biological problems and formulate intellectual and innovative vistas for research and development

**P04.** Provide potential solutions for solving technological problems in various domains of Biochemistry considering the societal, public health, cultural environmental factors.

**P05.** Examine the outcomes of biochemical issues critically and gain knowledge for composing suitable corrective measures.

**P06.** Posses self management and team work skills towards collaborative, multidisciplinary scientific endeavors in order to achieve common goals.

**P07.** Develop entrepreneurial and managerial skills for the implementation of multidisciplinary projects

**P08.** Posses the attitude necessary for lifelong and acquire communication skills relevant to professional positions

#### DEPARTMENT OF BIOCHEMISTRY (PG)

| Year/<br>Semester | Subject.   | Paper         | Ins.<br>Hrs<br>/week | Credit | Title of the Paper                                | Max Marks |      |       |
|-------------------|------------|---------------|----------------------|--------|---|-----------|------|-------|
|                   |            |               |                      |        |   | CIA       | Unit | Total |
| I Year            | Core       | Paper-I       | 4                    | 4      | Analytical Biochemistry                           | 25        | 75   | 100   |
|                   | Core       | Paper-II      | 4                    | 4      | Human Physiology & Nutritional Biochemistry       | 25        | 75   | 100   |
|                   | Core       | Paper-III     | 4                    | 4      | Biomolecules                                      | 25        | 75   | 100   |
|                   | Elective I | Paper-I       | 3                    | 3      | Molecular Biology                                 | 25        | 75   | 100   |
| I Semester        | Core       | Practical I   | 5                    | 0      | Quantitative analysis & Biochemical               | 0         | 0    | 0     |
|                   | Core       | Practical II  | 5                    | 0      | Enzyme Kinetic studies                            | 0         | 0    | 0     |
|                   | Core       | Practical III | 5                    | 0      | Isolation, Estimation of Biomolecules & Microbial | 0         | 0    | 0     |



|                             |                       |                   |           |           |  |    |    |     |
|-----------------------------|-----------------------|-------------------|-----------|-----------|--|----|----|-----|
|                             |                       |                   | <b>30</b> | <b>15</b> |  |    |    |     |
|                             | Self Study (Optional) |                   |           | 2         | Nutraceuticals and Nutrigenomics                                 |    |    |     |
| I Year<br>II Semest<br>er   | Core.                 | Paper-IV          | 3         | 3         | Enzymology   | 25 | 75 | 100 |
|                             | Core                  | Paper-V           | 3         | 3         | Intermediary Metabolism  | 25 | 75 | 100 |
|                             | Core                  | Paper-VI          | 4         | 4         | Ecology, Evolution & proteomics                                  | 25 | 75 | 100 |
|                             | Electiv<br>e II       | Paper-II          | 3         | 3         | Plant Biochemistry and Developmental                             | 25 | 75 | 100 |
|                             | Compulsory paper      |                   | 2         | 2         | Human Rights   | 25 | 75 | 100 |
|                             | Core                  | Practica<br>l I   | 5         | 5         | Quantitative analysis & Biochemical                              | 40 | 60 | 100 |
|                             | Core                  | Practica<br>l II  | 5         | 5         | Enzyme Kinetic studies   | 40 | 60 | 100 |
|                             | Core                  | Practica<br>l III | 5         | 5         | Estimation of Biomolecules & Microbial                           | 40 | 60 | 100 |
|                             |                       |                   | <b>30</b> | <b>30</b> |  |    |    |     |
| II Year<br>III Semest<br>er | Core                  | Paper VII         | 4         | 4         | Hormonal Biochemistry  | 25 | 75 | 100 |
|                             | Core                  | Paper VIII        | 4         | 4         | Immunology   | 25 | 75 | 100 |
|                             | Core                  | Paper IX          | 4         | 4         | Research Methodology   | 25 | 75 | 100 |
|                             | Electiv<br>e III      | Paper III         | 3         | 3         | Advanced Clinical Biochemistry                                   | 25 | 75 | 100 |
|                             | Core                  | Practica<br>l IV  | 5         | 0         | Biochemical Analysis of Blood, Immunological & Molecular methods | 0  | 0  | 0   |
|                             | Core                  | Practica<br>l V   | 5         | 0         | Hematological methods & Urine Analysis                           | 0  | 0  | 0   |
|                             | Core                  | Practica<br>l VI  | 5         | 0         | Computational Biology.   | 0  | 0  | 0   |
|                             |                       |                   | <b>30</b> | <b>15</b> |  |    |    |     |

|  |                          |                  |           |           |   |    |    |     |
|--|--------------------------|------------------|-----------|-----------|---|----|----|-----|
|  | Self Study<br>(Optional) |                  |           | 2         | Health Care<br>Management   |    |    |     |
| II<br>Year<br><br><br>IV<br>Semest<br>er | Core                     | Paper X          | 6         | 6         | Molecular Genetics  | 25 | 75 | 100 |
|  | Core                     | Elective<br>IV   | 3         | 3         | Biotechnology and<br>Bioinformatics                                       | 25 | 75 | 100 |
|  | Core                     | Practica<br>l IV | 5         | 5         | Biochemical<br>Analysis of Blood,<br>Immunological &<br>Molecular methods | 40 | 60 | 100 |
|  | Core                     | Practica<br>l V  | 5         | 5         | Hematological<br>methods and Urine  | 40 | 60 | 100 |
|  | Core                     | Practica<br>l VI | 5         | 5         | Computational<br>Biology  | 40 | 60 | 100 |
|  | Project                  |                  | 6         | 6         | Project/<br>Dissertation  | 25 | 75 | 100 |
|  |                          |                  | <b>30</b> | <b>30</b> |   |    |    |     |

| <b>Subject</b>      | <b>Papers</b> | <b>Credit</b> | <b>Total<br/>credits</b> | <b>Marks</b> | <b>Total<br/>marks</b> |
|---------------------|---------------|---------------|--------------------------|--------------|------------------------|
| Main                | 10            | 3-6           | 40                       | 100          | 1000                   |
| Main<br>Practical   | 6             | 5             | 30                       | 100          | 600                    |
| Elective            | 4             | 3             | 12                       | 100          | 400                    |
| Compulsory<br>paper | 1             | 2             | 2                        | 100          | 100                    |
| Project             | 1             | 5             | 6                        | 100          | 100                    |
| <b>Total</b>        | <b>22</b>     | <b>-</b>      | <b>90</b>                | <b>-</b>     | <b>2200</b>            |

## ANALYTICAL BIOCHEMISTRY

| Sem | Sub. Code | Category | Lecture  |          | Theory   |          | Practical |          | Credit |
|-----|-----------|----------|----------|----------|----------|----------|-----------|----------|--------|
|     |           |          | Hrs/week | Hrs/sem. | Hrs/week | Hrs/sem. | Hrs/week  | Hrs/sem. |        |
| I   |           | Core     | 4        | 60       | 4        | 60       | -         | -        | 4      |

### COURSE OBJECTIVE:

- To understand the basic principles of biochemical investigations
- To gain theoretical knowledge about various biochemical techniques
- To facilitate the students towards understanding the qualitative and quantitative analysis of different molecules of biochemical reactions.

### COURSE OUTCOMES:

On the successful completion of the course, students will be able to -

| CO Number  | CO Statement   | Knowledge Level (K <sub>1</sub> – K <sub>4</sub> ) |
|------------|--|--|
| <b>CO1</b> | To discuss about the basic concepts of biochemical investigations and cell study.  | <b>K1</b>  |
| <b>CO2</b> | Describes about the basic principle and methods of centrifugation.   | <b>K2</b>  |
| <b>CO3</b> | From this unit we can obtain the knowledge about the separation and analysis of macromolecules based on their size and charge. | <b>K2</b>  |
| <b>CO4</b> | Explains about the separation of individual compound from the mixture of compounds.  | <b>K3</b>  |
| <b>CO5</b> | We can understand the basic principles of spectroscopy and interaction of electromagnetic radiation with chemical substances.  | <b>K4</b>  |

(\*CO – Course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

**MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | M          |
| <b>CO2</b> | M          | M          | S          | S          | M          |
| <b>CO3</b> | S          | S          | M          | M          | S          |
| <b>CO4</b> | S          | S          | S          | S          | M          |
| <b>CO5</b> | M          | M          | M          | S          | S          |

(S- STRONG

M-MEDIUM

L – LOW)

**UNIT I****Total Hours: 75****General principles of biochemical investigations****(10 hrs)**

Organ and tissue slice technique, Cell disruption and homogenization techniques, Cell sorting and counting. Osmosis, Henderson-Hasselbalch equation, pH measurement using electrodes- Glass electrode, O<sub>2</sub> electrode, Cryopreservation, Microscopic techniques (SEM, TEM).

**UNIT II****Centrifugation and Radioactivity****(15 hrs)**

Basic principle, method and types- Preparative centrifugation- differential, density gradient centrifugation and its applications. Radioactivity- Radioactive isotopes, units, measurement of radioactivity – Scintillation Counter, Applications of radioisotopes (Autoradiography) and its aspects.

**UNIT III****Electrophoretic Techniques****(15 hrs)**

Principle, support media, factors affecting electrophoresis and types - High Voltage electrophoresis, Paper electrophoresis, SDS-PAGE, Two dimensional PAGE, Isoelectric focusing, DNA sequencing and Blotting techniques.

**UNIT IV****Chromatographic techniques****(15 hrs)**

Column, Paper, Thin Layer Chromatography, Ion Exchange, Affinity, Gas liquid, HPLC, Gel permeation chromatography - Principle, instrumentation and applications.

**UNIT V****Spectroscopic techniques****(20 hrs)**

Basic laws of light absorption- UV-visible and FT-IR Spectrophotometry – Flame spectrophotometry and Fluorimetry – Basic principle, Instrumentation and Applications. Turbidimetry and Nephelometry. Mass spectroscopy – GC – MS, ESR and NMR Spectroscopy. Instrumentation and Application of Atomic absorption spectroscopy.

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems – Nil

**TEACHING METHODOLOGY:**

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

**TEXT BOOKS:**

| S.NO | AUTHOR           | TITLE   | PUBLISHER                  | YEAR OF PUBLICATION            |
|------|------------------|---|----------------------------|--------------------------------|
| 1    | Avinash Upadhyay | Biophysical Chemistry, principles and Techniques. | Himalaya Publishing House. | 4 <sup>th</sup> Edition (2007) |
| 2    | Dr.P.Asokan      | Analytical Biochemistry                           | Chinna publications        | 1 <sup>st</sup> edition (2001) |

**REFERENCE BOOKS:**

| S.NO | AUTHOR                | TITLE                                     | PUBLISHER                        | YEAR OF PUBLICATION            |
|------|-----------------------|---|----------------------------------|--------------------------------|
| 1    | K.Wilson and I.Walker | Practical Biochemistry                    | Cambridge University press       | 5 <sup>th</sup> edition (2000) |
| 2    | S.K.Sawhney           | Introductory Practical Biochemistry       | Alpha Science International, Ltd | 2 <sup>nd</sup> edition (2005) |
| 3    | David Freifelder.     | Physical Biochemistry                     | Science Books International      | 2 <sup>nd</sup> edition (1982) |
| 4    | Galen Wood, Ewing     | Instrumental Methods of chemical Analysis | Mcgraw Hill college;             | 5 <sup>th</sup> edition (1985) |
| 5    | Robert D. Braun       | Introduction to instrumental analysis     | Pharma Med Press/BSP books       | 2 <sup>nd</sup> edition (2012) |
| 6    | R.Boyer               | Modern experimental biochemistry          | Addison Weslery Longman          | 3 <sup>rd</sup> edition (2000) |

|   |                      |                         |               |                               |
|---|----------------------|-------------------------|---------------|-------------------------------|
|   |                      |                         | Publishers    |                               |
| 7 | D.J.Homie and H.Peck | Analytical Biochemistry | Longman group | 1 <sup>st</sup> edition(2003) |

#### WEB SOURCES:

- [http://www.biology.arizona.edu/cell\\_bio/cell\\_bio.html](http://www.biology.arizona.edu/cell_bio/cell_bio.html)
- [https://ecok.libguides.com/biology/web\\_sources](https://ecok.libguides.com/biology/web_sources)
- <https://www.nicholls.edu/biol-ds/biol155/Lectures/Cell%20Biology.pdf>
- <http://www.bio-nica.info/Biblioteca/Bolsover2004CellBiology.pdf>

#### SYLLABUS DESIGNER:

- Dr.B.Hebsibah Elsie, Assistant Professor of Bio-Chemistry
- Ms.T.Nalini, Assistant Professor of Bio-Chemistry
- Mrs.G.Nithya, Assistant Professor of Bio-Chemistry

#### HUMAN PHYSIOLOGY AND NUTRITIONAL BIOCHEMISTRY

| Sem | Sub. Code | Category | Lecture   |           | Theory    |           | Practical |          | Credits |
|-----|-----------|----------|-----------|-----------|-----------|-----------|-----------|----------|---------|
|     |           |          | Hrs/ week | Hrs / sem | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem |         |
| I   |           | Core     | 4         | 60        | 4         | 60        | -         | -        | 4       |

#### COURSE OBJECTIVE:

To retain the straight forward approach to the description of the body systems and how they work, and the normal anatomy and physiology of each organ system human body.

#### COURSE OUTCOMES:

| CO Number | CO Statement  | Knowledge Level (K <sub>1</sub> – K <sub>4</sub> ) |
|-----------|---|--|
| CO1       | To have the basic knowledge of the structure and functions of heart transport of oxygen and nutrients, composition and function of Blood cells. | K1   |

|            |   |           |
|------------|---|-----------|
|            | To know structural organization of respiratory system and its function.   |           |
| <b>CO2</b> | To understand the structure, function and chemical digestion of digestive system.<br>To describe the structure and function of the organs in the urinary system.  | <b>K2</b> |
| <b>CO3</b> | An overview of types and essential function of muscle and its abilities in during response.<br>To learn the sum total of the chemical and electrical activity in the brain and nervous system.<br>To study the structure and function of Reproductive system. | <b>K2</b> |
| <b>CO4</b> | To study the importance of energy metabolism in Biochemical process of combining nutrients to release energy.   | <b>K3</b> |
| <b>CO5</b> | To know the role of vitamins and minerals and their requirements in the functioning of the human body.<br>Drug metabolism focused on the evaluation of toxicity, efficacy and invitro and invivo biological activities of drugs                               | <b>K4</b> |

(\*CO – Course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

#### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | S          | M          | M          | S          |
| <b>CO2</b> | S          | M          | M          | S          | M          |
| <b>CO3</b> | S          | S          | S          | S          | S          |
| <b>CO4</b> | M          | S          | S          | M          | M          |
| <b>CO5</b> | S          | M          | M          | S          | S          |

(S- STRONG

M-MEDIUM

L- LOW)

**Total Hours : 60**

### **UNIT I**

#### **Circulatory & Respiratory system**

**(10 hrs)**

Composition and functions of blood, Blood Clotting mechanism. Structure and function of heart and Cardiac cycle. Structure and function of lungs and mechanism of respiration.

## **UNIT II**

### **Digestive and Excretory system**

**(15 hrs)**

Structure and functions of digestive system- stomach, liver, pancreas, gall bladder and Intestine. Digestion, absorption and excretion. Structure and function of excretory system and role of kidney in acid- base balance.

## **UNIT III**

### **Muscular, Nervous and Reproductive system**

**(15 hrs)**

Type of muscles and mechanism of muscle contraction. Structure and functions of CNS- Brain, spinal cord and nerves, neurons. Transmission of nerve impulses & Neurotransmitters. Structure and function of reproductive system. Physiology of pregnancy, parturition & lactation.

## **UNIT IV**

### **Energy Metabolism**

**(10 hrs)**

Energy concepts of food, Unit and measurement of energy expenditure by bomb calorimeter, calorific value of proteins, carbohydrates and fat, RQ of foods. Basal metabolic rate (BMR), its measurement and influencing factors, SDA of foods. Nutritive value of foods, biological value of proteins. Protein malnutrition (kwashiorkor) and under nutrition (marasmus)- its preventive and curative measures.

## **UNIT V**

### **Vitamins, Minerals and Drug interaction.**

**(10 hrs)**

Food source of vitamins and minerals(Ca,P,Cu,K,Fe,I) their deficiency and toxicity. Drug- nutrient interaction and hormone- nutrient interaction.

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems – Nil

### **TEACHING METHODOLOGY:**

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations



**TEXT BOOKS:**

| S.NO | AUTHOR           | TITLE                                  | PUBLISHER    | YEAR OF PUBLICATION             |
|------|------------------|--|--------------|---------------------------------|
| 1.   | Ross and Willson | Human Physiology                       | Elsevier     | 11 <sup>th</sup> edition (2010) |
| 2    | K.Sembulingam    | Essentials of Medical Human Physiology | Juta,Limited | 4 <sup>th</sup> edition(2008)   |

**REFERENCE BOOKS:**

| S.NO | AUTHOR                | TITLE                                      | PUBLISHER              | YEAR OF PUBLICATION             |
|------|-----------------------|--|------------------------|---------------------------------|
| 1.   | William. F.Ganong     | Review of Medical physiology               | MCGraw- Hill Medical   | 22 <sup>nd</sup> edition (2005) |
| 2.   | Guyton and Hall       | Human Physiology and Mechanisms of Disease | Saunders Publications  | 6 <sup>th</sup> edition (1996)  |
| 3.   | C.C Chatterjee        | Human Physiology                           | Medical Allied Agency  | 11 <sup>th</sup> edition(1985)  |
| 4.   | Davidson and Passmore | Human Nutrition and Dietics                | Churchcill Livingstone | 8 <sup>th</sup> edition (1986)  |

**WEB SOURCES:**

- [http://www.biology.arizona.edu/cell\\_bio/cell\\_bio.html](http://www.biology.arizona.edu/cell_bio/cell_bio.html)
- [https://ecok.libguides.com/biology/web\\_sources](https://ecok.libguides.com/biology/web_sources)
- <https://www.nicholls.edu/biol-ds/biol155/Lectures/Cell%20Biology.pdf>
- <http://www.bio-nica.info/Biblioteca/Bolsover2004CellBiology.pdf>

**SYLLABUS DESIGNER:**

- Dr.V.Prabha, Head & Assistant Professor of Bio-Chemistry
- Dr.B.Hebsibah Elsie, Assistant Professor of Bio-Chemistry

**BIOMOLECULES**

| Sem | Sub. Code | Category | Lecture   |           | Theory    |           | Practical |           | Credits |
|-----|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
|     |           |          | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. |         |
| I   |           | Core     | 4         | 60        | 4         | 60        | -         | -         | 4       |

**COURSE OBJECTIVE:**

Objectives of this course is to enable the students to learn the basic functions, structures and biological importance of biomolecules like carbohydrates, lipids, proteins and nucleic acids. It also conveys the basic fundamental aspects of transport mechanism in cells.

**COURSE OUTCOMES:**

On the successful completion of the course, the students will be able to-

(\*CO – Course Outcomes

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K1-K4)</b> |
|------------------|---|--------------------------------|
| <b>CO1</b>       | Helps to understand about carbohydrates and its types.                            | K2                             |
| <b>CO2</b>       | Gives a clear understanding about amino acids and structures of various proteins. | K3                             |
| <b>CO3</b>       | A clear knowledge about lipids and its role.                                      | K2                             |
| <b>CO4</b>       | Provides an impression about structure of Nucleic acids.                          | K4                             |
| <b>CO5</b>       | Gives an awareness about membrane structure and transport mechanism.              | K3                             |

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

**MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | S          | M          |
| <b>CO2</b> | M          | S          | S          | M          | S          | M          |
| <b>CO3</b> | M          | S          | S          | S          | M          | S          |
| <b>CO4</b> | M          | M          | S          | S          | M          | S          |
| <b>CO5</b> | S          | S          | S          | M          | S          | S          |

(S- STRONG

M-MEDIUM

L- LOW)

## **UNIT I**

**Total hours:60**

### **Structure and Biological importance of carbohydrates**

**(10 hrs)**

Classification of carbohydrates – monosaccharides, disaccharides; N-linked, O-linked and GPI linked oligosaccharides, glycoproteins structure, function and recognition, poly saccharide; homo and hetero polysaccharides, Bacterial cell wall polysaccharides. Structure, location and biological role of proteoglycans (Glycosaminoglycans) and peptidoglycans.

## **UNIT II Proteins and Amino acids**

**(15hrs)**

Classification of amino acids, classification of proteins- size, solubility and structure-primary structure, secondary structure:  $\alpha$ - helix,  $\beta$ - sheets and turns, keratin: coil, collagen triple helix, Tertiary structure, Quaternary structure: structure and functions of Hb, actin, myosin, elastin. Solid-state synthesis of proteins, Protein sequencing (Sanger's method and Edman reaction)

## **UNIT III Structure and Function of Lipids**

**(15 hrs)**

Classification, structure, function of lipids. Fatty acids-saturated and unsaturated fatty acids. Lipids in cell membranes. Sterols- (Cholesterol, Bile acids and Bile Salts) structure, properties and functions. Eicosanoids – structure and biological role of prostaglandins, Leukotrienes, prostacyclins and thromboxanes. Lipoprotein classification and functions.

## **UNIT IV Nucleic acids**

**(10 hrs)**

Structure of nitrogenous bases, nucleosides & nucleotides. DNA double helix- Watson and Crick model of DNA, other forms; A, B, Z DNA. Properties of DNA- physical (buoyant density, viscosity) and chemical properties (renaturation and denaturation), RNA classes- mRNA, tRNA and rRNA, hnRNA, snRNA, miRNA-structure and function. Chemical and enzymatic methods of sequential analysis. Chemical synthesis of oligonucleotides.

## **UNIT V Membrane models and Transport system**

**(10 hrs)**

Structure, composition and assembly of biological membranes, membrane models. Membrane assembly- importins and exportins. Transport process- Passive transport- Facilitated transport, Active transport –  $\text{Na}^+\text{K}^+$ - ATPases like P-Type

ATPase. F-Type ATPase, V- Type ATPase. Co-transporters – Uniporter, Symporter, Antiporter. Ionophores. Endocytosis and exocytosis. Docking proteins and their functions.

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems – Nil

**TEACHING METHODOLOGY:**

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

**TEXT BOOKS:**

| S.No | Author Name   | Title of the Book          | Publisher  | Year |
|------|---|----------------------------|--|------|
| 1.   | Thomas M Devlin   | Text book of Biochemistry  | A John Wiley, Inc publication, New York, 4th edition | 1997 |
| 2.   | Eric E.Conn, P.K. Stumpf, G.Brueins and Ray H.Doi, John | Outlines of Biochemistry,  | Wiley and sons, Singapore, 5th edition               | 2005 |
| 3.   | Garrett & Grisham                                       | Principles of Biochemistry | Saunders College publishing                          | 1994 |
| 4.   | U. Sathayanarayana                                      | Biochemistry               | Books and allied (P) ltd., India, 3rd edition        | 2006 |

**REFERENCE BOOKS:**

| S.No | Author Name                                | Title of the Book                    | Publisher  | Year |
|------|--|--------------------------------------|--|------|
| 1.   | Lubert Stryer                              | Biochemistry                         | W.H.Freeman and CoSanfrancisco, 5 <sup>th</sup> edition. | 2002 |
| 2.   | Donald Voet, Judith G.Voet and Charlotte W | Fundamentals of Biochemistry         | Pratt,John Wiley and Sons, 3 <sup>rd</sup> edition.      | 2008 |
| 3.   | David L. Nelson and Michael Cox.           | Lehninger Principle of Biochemistry, | W.H.Freeman,4 <sup>th</sup> edition                      | 2004 |
| 4.   | Zubay G L                                  | Biochemistry                         | W M C Brown publishers, 4 <sup>th</sup> edition.         | 1988 |

**WEB SOURCES:**

- [http://www.biology.arizona.edu/cell\\_bio/cell\\_bio.html](http://www.biology.arizona.edu/cell_bio/cell_bio.html)
- [https://ecok.libguides.com/biology/web\\_sources](https://ecok.libguides.com/biology/web_sources)
- <https://www.nicholls.edu/biol-ds/biol155/Lectures/Cell%20Biology.pdf>
- <http://www.bio-nica.info/Biblioteca/Bolsover2004CellBiology.pdf>

**SYLLABUS DESIGNER:**

- Dr.V.Prabha, Head & Assistant Professor of Bio-Chemistry
- Dr.S.Asha, Assistant Professor of Bio-Chemistry

**MOLECULAR BIOLOGY**

| Sem | Subject Code | Category | Lecture  |          | Theory   |          | Practical |          | Credits |
|-----|--------------|----------|----------|----------|----------|----------|-----------|----------|---------|
|     |              |          | Hrs/week | Hrs/sem. | Hrs/week | Hrs/sem. | Hrs/week  | Hrs/sem. |         |
| I   |              | Elective | 3        | 45       | 3        | 45       | -         | -        | 3       |

**COURSE OBJECTIVE**

To enable the students to learn about the synthesis and functions of molecules that make up living organisms, their mutation and identification of mutants. Also learn about the mechanism of synthesis of DNA, RNA and proteins, gene regulation and gene mutation. Techniques used in molecular biology.

**COURSE OUTCOMES:**

On the successful completion of the course, the students will be able to,

| CO Number | CO Statement   | Knowledge Level (K <sub>1</sub> – K <sub>4</sub> ) |
|-----------|--|--|
| CO1       | To understand the types, models and synthesis of genetic materials both in prokaryotes and eukaryotes. | K1   |
| CO2       | To know the mechanism of RNA synthesis both in prokaryotes and eukaryotes.                             | K2   |
| CO3       | Explains the steps involved in protein synthesis both in prokaryotes and eukaryotes .                  | K2   |
| CO4       | Describes the gene expression concepts.  | K3   |
| CO5       | Explains gene repair mechanism and gene mutation.  | K4   |

(\*CO – Course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

#### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | S          | M          | M          | M          |
| <b>CO2</b> | M          | S          | S          | M          | S          |
| <b>CO3</b> | S          | M          | S          | S          | M          |
| <b>CO4</b> | M          | S          | M          | S          | M          |
| <b>CO5</b> | S          | S          | M          | M          | M          |

(S- STRONG

M-MEDIUM

L- LOW)

#### **UNIT I**

**Total Hours: 45**

#### **DNA Replication**

**[10 hrs]**

Types of replication, evidence for semiconservative replication - Meselson and Stahl experiment, replications in circular chromosomes - Cairns model, rolling circle model. Replication in prokaryotes , replication bubble, bidirectional replication, replicon, action of SSB, primase, DNA gyrase, topoisomerases, DNA polymerase I, II, and III, lagging and leading strand synthesis, Okazaki fragments, inhibitors of replication, replication in RNA virus, plasmid replication, reverse transcriptase, retroviruses. Eukaryotic replication.

#### **UNIT II Transcription**

**[10 hrs]**

Transcription - definition, coding strand, template strand, sense strand and antisense strand, promotor, foot-printing experiment, DNA- dependent RNA polymerase role of Prinbnow box, template binding, prokaryotic transcription, Rho - dependent and independent termination, posttranscriptional processing in prokaryotes. Eukaryotic transcription, split genes, overlapping genes, housekeeping genes, biosynthesis of rRNA and tRNA, RNA editing - post-transcriptional modifications of eukaryotic RNAs, RNA splicing, introns and splicing reactions, self-splicing introns - group I and group II, exons, spacer sequences, enhancers, inhibitors of transcription.

#### **UNIT III Genetic Code and Translation**

**[10hrs]**

Genetic code - definition, deciphering of the genetic code, codon dictionary, salient features of genetic code - wobble mechanism and its significance. structure of tRNA, activating enzymes, binding of amino acids to tRNA, composition of prokaryotic and eukaryotic ribosomes, leader region, Shine-Dalgarno sequence, prokaryotic and eukaryotic protein biosynthesis - initiation, elongation, and termination, polysomes, post-translational modifications in prokaryotes and eukaryotes, inhibitors of protein synthesis.

#### **UNIT IV Protein Transport and Gene Expression**

**[8 hrs]**

Protein targeting, translocation, heat shock proteins, glycosylation, SNAPs and SNAREs, bacterial signal sequences, mitochondrial, chloroplast and nuclear protein transport, endocytosis-viral entry, ubiquitin TAG protein destruction, gene expression and regulation, molecular mechanism of regulation, prokaryotes - operon model, lac, trp, arabinose operons, repression and attenuation, eukaryotes - C value paradox, repetitive DNA, gene dosage and gene amplifications.

## **UNIT V Mutagenesis, DNA Damage and Repair**

**[7 hrs]**

Mutagenesis and replication fidelity, misincorporation of nucleotides during DNA synthesis, transient and spontaneous chemical changes in DNA, frameshift mutagenesis, DNA damage - different types, DNA repair - direct reversal repair, direct repair of nicks, excision repair, nucleotide excision repair, SOS repair, mismatch repair.

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems – Nil

### **TEACHING METHODOLOGY:**

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

### **TEXT BOOKS:**

| <b>S.NO</b> | <b>AUTHORS</b>   | <b>TITLE</b>               | <b>PUBLISHERS</b>   | <b>YEAR OF PUBLICATION</b> |
|-------------|------------------|----------------------------|---------------------|----------------------------|
| 1           | Robert F. Weaver | Molecular biology          | McGraw-Hill         | 2007                       |
| 2           | R. M. Twyman     | Advanced molecular biology | Narosa Publications | 1998                       |

### **REFERENCE BOOKS:**

| <b>S. NO</b> | <b>AUTHORS</b>         | <b>TITLE</b>                                   | <b>PUBLISHERS</b>    | <b>YEAR OF PUBLICATION</b> |
|--------------|------------------------|--|----------------------|----------------------------|
| 1            | Robert E Harsman       | The Cell- A Molecular Approach Geoffrey Cooper | ASM Press            | 2004                       |
| 2            | Lodish <i>et al.</i> , | Molecular Cell Biology                         | WH Freeman & Company | 2003                       |
| 3            | De Robertis and        | Cell and Molecular                             | Wolters              | 2001                       |

|   |  |                               |                      |      |
|---|--|-------------------------------|----------------------|------|
|   | De Robertis  | Biology                       | Kluwer India Pvt Ltd |      |
| 4 | Alberts <i>et al.</i> ,  | Molecular Biology of the Cell | Garland Science Inc  | 2002 |
| 5 | David Freifelder   | Molecular Biology             | Narosa Publications  | 2000 |
| 6 | Jocelyn E. Krebs, Elliott S. Goldstein , Stephen T. Kilpatrick | Genes II                      | Navigate Publication | 2017 |

#### **WEB SOURCES:**

- [http://www.biology.arizona.edu/cell\\_bio/cell\\_bio.html](http://www.biology.arizona.edu/cell_bio/cell_bio.html)
- [https://ecok.libguides.com/biology/web\\_sources](https://ecok.libguides.com/biology/web_sources)
- <https://www.nicholls.edu/biol-ds/biol155/Lectures/Cell%20Biology.pdf>
- <http://www.bio-nica.info/Biblioteca/Bolsover2004CellBiology.pdf>

#### **SYLLABUS DESIGNER:**

- Dr.S.Asha, Assistant Professor of Bio-Chemistry
- Mrs.K.Shoba, Assistant Professor of Bio-Chemistry

### **SELF STUDY**

#### **NUTRACEUTICALS AND NUTRIGENOMICS**

#### **OBJECTIVES**

To enable the students to

- Gain knowledge on Nutraceutical and Nutrigenomics
- Study the applications of Nutrigenomics in health and disease.

#### **UNIT I**

#### **NUTRACEUTICALS AND FUNCTIONAL FOODS**

Definition of functional and traditional foods, nutraceuticals, designer foods and pharma foods, history of functional foods, components of functional foods, foods containing nutraceuticals and classification of nutraceuticals – based on plant sources, mechanism of action and chemical nature



## **UNIT II**

### **ROLE OF DIETARY SUPPLEMENTS AND NUTRACEUTICALS IN HEALTH AND DISEASE**

Concept of dietary supplements, sources and functions of phytochemicals with suitable examples, FOSHU foods – concepts, regulatory aspects

## **UNIT III**

### **PROBIOTICS AND PREBIOTICS**

Human gastrointestinal tract and its microbiota, functions, concept of probiotic, prebiotics and symbiotics; applications of probiotics in human nutrition

## **UNIT IV**

### **NUTRIGENOMICS**

Definition of nutrigenomics, gene expression – transcription, translation, post translational modification, nutrition in the omics era- elementary concepts on epigenetics, transcriptomics, proteomics, metabolomics; genetic variation and nutritional implications

## **UNIT V**

### **NUTRITION AND GENE EXPRESSION AND NUTRIGENOMICS AND COMPLEX DISEASES**

Nutrient control of gene expression – amino acids, nucleotides, basic concepts of nutrigenomics and complex diseases – diabetes, cancer and obesity

## **REFERENCES**

1. Mahtab, S, Bamji, Kamala Krishnasamy, G.N.V. Brahman, Text Book of Human Nutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi, 2009.
2. Srilakshmi, B. Second Edition, Food Science, New Age International (P) Limited Publishers, New Delhi, 2010.B.Sc. Nutrition, Food Service Management and Dietetics: Syllabus (CBCS)57
3. Simopoulos, A.P. and Ordoas, K.J.M., 2004, Nutrigenetics and Nutrigenomics, Vol. 93, Karger, Switzerland.
4. Watson, David, H., 2003, Performance Functional Foods, CRC Press, Wood Head Publishing Ltd., England

5. Tamine, A., 2005, Probiotic Dairy Products, Blackwell Publishing Ltd., UK
  6. Narasinga Rao, B.S., 2005, Nutrition Research in India – A Country Report, Published by INSA, New Delhi.
  7. Webb, G.P., 2006, Dietary Supplementations and Functional Foods, Blackwell Publishing Ltd., New York.
  8. Tai, E.S. and Gillies, P.J., 2007, Nutrigenomics – Opportunities in Asia, Karger, Singapore.
- B.Sc. Nutrition, Food Service Management and Dietetics: Syllabus (CBCS)58

### ENZYMOLOGY

| Sem | Sub. Code | Category | Lecture  |          | Theory   |          | Practical |          | Credits |
|-----|-----------|----------|----------|----------|----------|----------|-----------|----------|---------|
|     |           |          | Hrs/week | Hrs/sem. | Hrs/week | Hrs/sem. | Hrs/week  | Hrs/sem. |         |
| II  |           | Core     | 3        | 45       | 3        | 45       | -         | -        | 3       |

#### COURSE OBJECTIVE:

- To understand the classification of enzymes and fundamentals of enzyme assay. Also, understanding of kinetics of enzyme catalyzed reactions and derivation of Michaelis Menten equation.
- To advance the knowledge on mechanism of enzyme action as well as regulation of enzyme action with relevant examples.
- To study about the techniques of immobilization and application in enzymes in food and pharmaceutical industries.

#### COURSE OUTCOMES :

On the successful completion of the course, the students will be able to,

| CO Number | CO Statement  | Knowledge Level (K <sub>1</sub> – K <sub>4</sub> ) |
|-----------|---|--|
| CO1       | Course material will help in understanding of nomenclature and classification of enzymes and also the fundamentals of enzyme assay. | K1   |
| CO2       | Students will thoroughly understand the Kinetics of enzyme assay and derivation of velocity equations.                              | K2   |

|            |   |           |
|------------|---|-----------|
| <b>C03</b> | Course will advance the knowledge of students on mechanism of enzyme action.  | <b>K2</b> |
| <b>C04</b> | Understanding of detailed mechanism in enzyme regulation with relevant examples.  | <b>K3</b> |
| <b>C05</b> | Students will gain knowledge in various immobilization techniques and industrial and therapeutic application of enzymes | <b>K4</b> |

(\*CO – Course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

## MAPPING WITH PROGRAMME OUTCOMES:

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | M   | S   | M   |
| CO2 | S   | S   | M   | M   | S   | S   |
| CO3 | M   | M   | M   | S   | M   | S   |
| CO4 | S   | M   | S   | S   | M   | M   |
| CO5 | M   | S   | S   | M   | S   | S   |

(S- STRONG

M-MEDIUM

L - LOW)

## UNIT I

**Total Hours:45**

## Enzymes

**( 5 hrs)**

Introduction to Enzymes - Nomenclature and classification of enzymes, enzyme units, Specificity and active site, Intracellular location of Enzymes, Determination of active site, Extraction, Purification and characterization of enzymes. Zymogen activation, Antioxidant enzymes, Isoenzymes, multienzyme complex - Structure and Mechanism of action of PDH and FAS, ribozymes

## UNIT II

## Enzymes Kinetics and enzyme inhibition

**(10 hrs)**

Enzyme Kinetics - Steady state theory, MM Equation, significance of  $K_m$  and  $V_{max}$ , LB Plot, Eadie Hofstee Plot, Briggs - Hanes Plot. Factors affecting enzyme activity, kinetics of multisubstrate enzymes - Types of kinetic mechanisms for bi-

substrate reactions – sequential and ping-pong. Metalloenzymes and Metal - activated Enzymes. Reversible and irreversible enzyme inhibition.

### **UNIT III**

#### **Mechanism of Enzyme activity and Co-enzymes**

**(10 hrs)**

Mechanism of Enzyme Action – Acid-base catalysis, covalent catalysis, proximity, orientation effect. Strain & distortion theory. Chemical modification of active site groups. Site directed mutagenesis of enzymes. Structure and mechanism of action of chymotrypsin, lysozyme, carboxypeptidase. Vitamin and non-vitamin co-enzymes – structure and biochemical functions of NAD, FAD, TPP, PLP, Biotin and CoA.

### **UNIT IV**

#### **Enzyme Regulation and Cooperativity**

**(10 hrs)**

Enzyme Regulation–General mechanisms of enzyme regulation, product inhibition. Reversible (glutamine synthase & phosphorylase) and irreversible (proteases) covalent modifications of enzymes. Mono cyclic and multicyclic cascade systems with specific examples. Feed back inhibition and feed forward stimulation. Allosteric enzymes, qualitative description of “concerted” & “sequential” models for allosteric enzymes. Half site reactivity, Flipflop mechanism, positive and negative cooperativity with special reference to aspartate transcarbamoylase & phosphofructokinase. Regulation of enzyme activity by proteolytic cleavage.

### **UNIT V**

#### **Applications of enzymes**

**(10 hrs)**

Application of enzymes in food, pharmaceutical, pulp, textile and other industries; diagnostic & therapeutic applications. Immobilized enzymes - Techniques of enzyme immobilization; applications of immobilized enzymes. Enzymes as Biosensors - Calorimetric, Amperometric, Optical and Immuno biosensors. Enzyme Engineering: Artificial enzymes. Future prospects of Enzyme engineering. Abzymes.

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems – Nil

#### **TEACHING METHODOLOGY:**

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

**TEXT BOOKS:**

| S.NO | AUTHORS     | TITLE                         | PUBLISHERS              | YEAR OF PUBLICATION |
|------|-------------|-------------------------------|-------------------------|---------------------|
| 1    | S.M. Bhatt  | Enzymes and Enzyme Technology | Chand Publishing        | 2004                |
| 2    | T. Devasena | Enzymology                    | Oxford University Press | 2003                |

**REFERENCE BOOKS:**

| S.NO | AUTHORS  | TITLE                      | PUBLISHERS              | YEAR OF PUBLICATION |
|------|--|----------------------------|-------------------------|---------------------|
| 1    | Trevor Palmer  | Enzymes                    | West Press Pvt. Ltd     | 2004                |
| 2    | Dixon , E.C Webb, CJR Thorne and K.F. Tipton, Longmans | Enzymes                    | Academic Press          | 2002                |
| 3    | Nicholas C.Price, Lewis Stevans.                       | Fundamentals of Enzymology | Oxford University Press | 1998                |
| 4    | Trevor Palmer  | Understanding Enzymes      | Ellis Horwood Limited.  | 1991                |
| 5    | Boyer  | The Enzymes                | Academic Press          | 1982                |

**WEB SOURCES:**

- [http://www.biology.arizona.edu/cell\\_bio/cell\\_bio.html](http://www.biology.arizona.edu/cell_bio/cell_bio.html)
- [https://ecok.libguides.com/biology/web\\_sources](https://ecok.libguides.com/biology/web_sources)
- <https://www.nicholls.edu/biol-ds/biol155/Lectures/Cell%20Biology.pdf>
- <http://www.bio-nica.info/Biblioteca/Bolsover2004CellBiology.pdf>

**SYLLABUS DESIGNER:**

- Dr.V.Prabha, Head & Assistant Professor of Bio-Chemistry
- Ms.T.Nalini, Assistant Professor of Bio-Chemistry

## INTERMEDIARY METABOLISM

| Sem | Sub. Code | Category | Lecture   |          | Theory    |           | Practical |           | Credits |
|-----|-----------|----------|-----------|----------|-----------|-----------|-----------|-----------|---------|
|     |           |          | Hrs/ week | Hrs/ sem | Hrs/ week | Hrs / sem | Hrs/ week | Hrs / sem |         |
| II  |           | Core     | 3         | 45       | 3         | 45        | -         | -         | 3       |

### COURSE OBJECTIVE

To reflect the latest advances in Biochemistry those are important to medicine on the structural basis of main Biomolecule including the regulation and control of biological mechanism

### COURSE OUTCOMES :

On the successful completion of the course, the students will be able to,

| CO Number  | CO Statement  | Knowledge Level (K <sub>1</sub> – K <sub>4</sub> ) |
|------------|---|--|
| <b>CO1</b> | Understand the basics of electron transport chain, and component of oxidative phosphorylation   | <b>K1</b>  |
| <b>CO2</b> | To study the metabolism and regulation of Carbohydrates in mammals.   | <b>K2</b>  |
| <b>CO3</b> | This describes the Biosynthesis and regulation of protein and amino acid metabolism   | <b>K2</b>  |
| <b>CO4</b> | This chapter deals with lipid metabolism and to determine the effect of dietary fat intake. Metabolism of ketone bodies and its regulations | <b>K3</b>  |
| <b>CO5</b> | To learn the synthesis and regulation of Nucleic acids  | <b>K4</b>  |

(\*CO – Course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

### MAPPING WITH PROGRAMME OUTCOMES:

| COS        | PO1 | PO2 | PO3 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | S   | M   | M   |
| <b>CO2</b> | S   | M   | S   | S   | S   |
| <b>CO3</b> | M   | S   | M   | S   | M   |
| <b>CO4</b> | S   | S   | M   | M   | S   |
| <b>CO5</b> | M   | S   | M   | S   | M   |

(S- STRONG

M-MEDIUM

L- LOW)

## **UNIT I**

**Total Hrs : 45**

### **Electron Transport and Oxidative Phosphorylation**

**(5 hrs)**

High-energy phosphates- components of Electron Transport chain and the sequence of electron transport (Respiratory chain), Mechanism of ATP synthesis, oxidative phosphorylation – Chemiosmotic theory, uncoupling of oxidative phosphorylation. Mitochondrial transport system and Types of shuttle systems.

## **UNIT II**

### **Metabolism of carbohydrates and Regulation**

**(10 hrs)**

Introduction to metabolism of cells - Glycogenesis, Glycogenolysis, Glycolysis, and its energetics, amphibolic nature of TCA cycle and its regulation, Gluconeogenesis and their regulation. HMP Shunt, Cori cycle and Glyoxylate cycle. Metabolism of glycoproteins. Metabolism of fructose, galactose and its regulation

## **UNIT III**

### **Metabolism of Proteins**

**(10hrs)**

Biosynthesis of non- essential amino acids, Degradation of amino acids- oxidative and non- oxidative deamination, transamination and decarboxylation, reactions of urea cycle and its significance. Catabolism of amino acids- ketogenic and glucogenic amino acid such as methionine, phenylalanine and tyrosine. Conversion of amino acids to special products(melanin, serotonin, dopamine).

## **UNIT IV**

### **Lipid Metabolism**

**(10 hrs)**

$\alpha$ ,  $\beta$ , and  $\omega$  oxidation of fatty acids and its regulation, Biosynthesis of saturated and unsaturated fatty acids. Lipoproteins and their metabolism. Biosynthesis of lecithins, cephalins, sphingomyelin, ceramides, cerebrosides, gangliosides; metabolism of ketone bodies, cholesterol biosynthesis and regulation. Degradation of cholesterol.

## **UNIT V**

### **Nucleic Acid Metabolism**

**(10 hrs)**

Synthesis of purines and pyrimidines. De novo and salvage pathways, Biosynthesis of deoxyribonucleotides & inhibitors of nucleotide metabolism. Regulation of nucleotide biosynthesis. Degradation of purine and pyrimidines.

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems – Nil

**TEACHING METHODOLOGY:**

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

**Text Books:**

| S.NO | AUTHOR        | TITLE                 | PUBLISHER   | YEAR OF PUBLICATION             |
|------|---------------|-----------------------|-------------|---------------------------------|
| 1    | Murray, et al | Harper's Biochemistry | McGraw Hill | 26 <sup>th</sup> edition (2003) |

**REFERENCE BOOKS:**

| S.NO | AUTHOR                               | TITLE                                  | PUBLISHER                         | YEAR OF PUBLICATION             |
|------|--------------------------------------|--|-----------------------------------|---------------------------------|
| 1    | Campbell and Farrell                 | Biochemistry                           | Brooks/ Cole Pub Co               | 4 <sup>th</sup> edition. 2005   |
| 2    | Davidson and Sittman                 | Biochemistry NMS                       | Lippincott. Williams and Willkins | 4 <sup>th</sup> edition (1999)  |
| 3    | Donald Voet, J.G Voet and John Wiley | Biochemistry                           | John Wiley & sons Canada, Ltd     | 2 <sup>nd</sup> edition (1995)  |
| 4    | Kuchel and Ralston                   | Biochemistry                           | Schaum's outlines McGraw Hill     | 2 <sup>nd</sup> edition (1998)  |
| 5    | Nelson Cox                           | Lehninger's principles of Biochemistry | McMillan Worth.                   | 26 <sup>th</sup> edition (2003) |
| 6    | Stryer                               | Biochemistry                           | W.H.Freeman                       | 6 <sup>th</sup> edition (2006)  |

**WEB SOURCES:**

- [http://www.biology.arizona.edu/cell\\_bio/cell\\_bio.html](http://www.biology.arizona.edu/cell_bio/cell_bio.html)
- [https://ecok.libguides.com/biology/web\\_sources](https://ecok.libguides.com/biology/web_sources)
- <https://www.nicholls.edu/biol-ds/biol155/Lectures/Cell%20Biology.pdf>
- <http://www.bio-nica.info/Biblioteca/Bolsover2004CellBiology.pdf>



**SYLLABUS DESIGNER:**

- Dr.B.Hebsibah Elsie, Assistant Professor of Bio-Chemistry
- Ms.T.Nalini, Assistant Professor of Bio-Chemistry

**ECOLOGY, EVOLUTION AND PROTEOMICS**

| Sem | Sub. Code | Category | Lecture   |           | Theory    |           | Practical |           | Credits |
|-----|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
|     |           |          | Hrs/ week | Hrs/ Sem. | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. |         |
| II  |           | Core     | 4         | 45        | 4         | 45        | -         | -         | 4       |

**COURSE OBJECTIVE:**

- To appreciate the importance of ecology and evolution to motivate the students to attend competitive exams like CSIR, ICMR, SLET, etc.,
- To facilitate the students towards understanding the structural and functional importance of Proteins and proteome.
- To throw light on the various techniques in Proteomics

**COURSE OUTCOMES:**

On the successful completion of the course, the students will be able to,

| CO Number  | CO Statement  | Knowledge Level (K <sub>1</sub> – K <sub>4</sub> ) |
|------------|---|--|
| <b>CO1</b> | To understand the basics of Environment and ecology                           | <b>K1</b>  |
| <b>CO2</b> | To understood the Characteristics features of Populations.                    | <b>K2</b>  |
| <b>CO3</b> | To learn about the various process and importance of proteins and proteomics. | <b>K2</b>  |
| <b>CO4</b> | To learn about various techniques involved in proteomics.                     | <b>K3</b>  |
| <b>CO5</b> | To know the application of proteomics in research.                            | <b>K4</b>  |

(\*CO – Course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

**MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | S          | M          | S          | M          |
| <b>CO2</b> | S          | M          | S          | M          | S          |
| <b>CO3</b> | S          | M          | S          | M          | M          |
| <b>CO4</b> | M          | S          | M          | S          | S          |
| <b>CO5</b> | S          | M          | S          | M          | S          |

(S-STRONG

M-MEDIUM

L- LOW)

**UNIT I****Total Hours : 45****Environment and Ecological Succession****(5 hrs)**

Physical environment – Biotic and abiotic environment; concept of habitat and niche, niche width and overlap, fundamental and realized niche, resource partitioning, character displacement. Ecological succession - types, mechanisms, and changes involved in succession.

**UNIT II****Population Ecology****(10 Hrs)**

Characteristics of a population, population growth curves, population regulation, life history strategies (r and k selection). Concept of metapopulation - demes and dispersal, interdemic extinctions, age structured populations.

**UNIT III****Evolution of Cells****(10 hrs)**

Origin of basic biological molecules; abiotic synthesis of organic monomers and polymers; concept of Oparin and Haldane, experiment of Miller. Evolution of prokaryotes and eukaryotes. Origin of cell organelles – Mitochondria and Chloroplasts.

**UNIT IV****Proteomics and Proteome****(10 Hrs)**

Introduction about Proteomics, The new biology - proteomics - an analytical challenge, tools of proteomics. The Proteome and Genome, the life and Death of a

protein. Protein as Modular Structures, Functional protein families, deducing the proteome from the genome and protein levels.

## UNIT V

### Tools of proteomics and its applications

(10 Hrs)

Overview, Complex Protein and Peptide Mixtures, Extraction of protein samples from Biological Samples, Protein Separation Before Digestion, Protein digestion techniques. Application of proteomics. New directions in proteomics.

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems – Nil

### TEACHING METHODOLOGY:

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

### TEXT BOOKS:

| S.NO | AUTHORS                                | TITLE   | PUBLISHERS                 | YEAR OF PUBLICATION |
|------|--|---|----------------------------|---------------------|
| 1.   | Janine M Benyus                        | Bioimicry:<br>Innovation<br>Inspired by<br>Nature | Perenneial                 | 2001                |
| 2.   | Eugene P. Odum                         | Fundamentals of<br>Ecology Hardcover              | Humana Press               | 2004                |
| 3.   | Daniel C. Liebler                      | Introduction to<br>Proteomics                     | Humana Press               | 1984                |
| 4.   | Branden, C and<br>J.Troze              | Introduction to<br>protein structure              | John Wiley &<br>Sons. Inc. | 1999                |
| 5.   | Baxevanis, A.D and<br>Ouellette, B.F.F | Bioinformatics                                    | Wiley interscience         | 2001                |

**REFERENCE BOOKS:**

| S.NO | AUTHORS                     | TITLE  | PUBLISHERS                    | YEAR OF PUBLICATION |
|------|-----------------------------|--|-------------------------------|---------------------|
|      | Higgins, D and Taylor, W    | Bioinformatics: Sequence, structure and databnks | Oxford University Press       | 2000                |
|      | Misener, S and Krawetz, S.A | Bioinformatics: methods and protocols            | Replica press private limited | 2001                |
|      | Eugene Odum                 | Fundamentals of ecology                          | Informa company               | 2005                |

**WEB SOURCES:**

- [http://www.biology.arizona.edu/cell\\_bio/cell\\_bio.html](http://www.biology.arizona.edu/cell_bio/cell_bio.html)
- [https://ecok.libguides.com/biology/web\\_sources](https://ecok.libguides.com/biology/web_sources)
- <https://www.nicholls.edu/biol-ds/biol155/Lectures/Cell%20Biology.pdf>
- <http://www.bio-nica.info/Biblioteca/Bolsover2004CellBiology.pdf>

**SYLLABUS DESIGNER:**

- Dr.V.Prabha, Head & Assistant Professor of Bio-Chemistry
- Mrs.K.Shoba, Assistant Professor of Bio-Chemistry

**PLANT BIOCHEMISTRY AND DEVELOPMENTAL BIOLOGY**

| Sem | Sub. Code | Category | Lecture   |           | Theory    |           | Practical |           | Credits |
|-----|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
|     |           |          | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. |         |
| II  |           | Elective | 3         | 45        | 3         | 45        | -         | -         | 3       |

**COURSE OBJECTIVE:**

The course aims to give exposure to learn the concepts involved in photosynthesis, nitrogen fixation, hormonal mechanism, transport mechanism, developmental biology such as gametogenesis, fertilization and development of organs.

**COURSE OUTCOMES:**

On the successful completion of the course, the students will be able to,

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| <b>CO1</b>       | Helps to understand about photosystem in plants  | K2                             |
| <b>CO2</b>       | Gives a clear understanding about the process of nitrogen fixation and plant hormones. | K3                             |
| <b>CO3</b>       | A Clear Knowledge about transport process involved in plants.                          | K2                             |
| <b>CO4</b>       | Describes the process involved in fertilization.                                       | K4                             |
| <b>CO5</b>       | Describe development and differentiation of organs in plants.                          | K3                             |

(\*CO – Course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

#### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | S          | M          |
| <b>CO2</b> | S          | S          | M          | M          | S          | S          |
| <b>CO3</b> | M          | M          | M          | S          | M          | S          |
| <b>CO4</b> | S          | M          | S          | S          | M          | M          |
| <b>CO5</b> | M          | S          | S          | M          | S          | S          |

(S- STRONG

M-MEDIUM

L- LOW)

#### **UNIT I**

**Total Hours:45**

##### **Introduction to plant biochemistry**

**(10 hrs)**

Photosynthesis- Photosynthetic pigments, light harvesting complexes, Light reaction, CO<sub>2</sub> fixation – C<sub>3</sub>, C<sub>4</sub> and CAM metabolism. Mode of action of DCMU, Rubisco, Bacterio rhodopsin, photorespiration, Glyoxalate cycle. Respiration – citric acid cycle, plant mitochondrial electron transport and ATP synthesis

#### **UNIT II**

##### **Nitrogen metabolism and plant Hormones**

**(10 hrs)**

Nitrogen cycle, diazotrophs, Biochemistry of symbiotic and non-symbiotic nitrogen fixation and genetics of N<sub>2</sub> fixation, Genetic manipulation of Nif genes.

Biosynthesis, mode of action, transport, distribution & physiologic effects of auxins, gibberlins, cytokinins, ABA and ethylene.

### **UNIT III**

#### **Transport mechanism in plants**

**(10 hrs)**

Uptake, transport and translocation of water, ions, solutes and macromolecules from soil, through cells, across membranes, through xylem and phloem; transpiration; mechanisms of loading and unloading of photo assimilates.

### **UNIT IV**

#### **Gamatogenesis, fertilization and early development**

**(10 hrs)**

Production of gametes, embryo sac development and double fertilization in plants; zygote formation, embryogenesis, establishment of symmetry in plants; seed formation and germination.

### **UNIT V**

#### **Morphogenesis and organogenesis in plants**

**(5 hrs)**

Organization of shoot and root apical meristem; shoot and root development; leaf development and phyllotaxy; transition to flowering, floral meristems and floral development in Arabidopsis and Antirrhinum.

**DISTRIBUTION OF MARKS:** Theory - 100% and Problems – Nil

#### **TEACHING METHODOLOGY:**

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

#### **TEXT BOOK**

| <b>S.No</b> | <b>Author Name</b> | <b>Title of the Book</b>        | <b>Publisher</b>       | <b>Year</b> |
|-------------|--------------------|---------------------------------|------------------------|-------------|
| 1.          | Berrill N.J        | Developmental Biology           | TMH Edition            | 1974        |
| 2.          | V.K Jain           | Fundamental of plant physiology | S. Chand & company Ltd | 2000        |

**REFERENCE BOOKS:**

| S.No | Author Name                                  | Title of the Book                        | Publisher   | Year |
|------|--|--|---|------|
| 1.   | William G. Harpkins                          | Introduction to plant physiology         | John Wiley and sons, INC, 2 <sup>nd</sup> edition | 1999 |
| 2.   | Browder L.W., Erickson C.A., And Jeffery W.R | Developmental Biology                    | Saunders College Publishing House, Philadelphia   | 1991 |
| 3.   | Lea and Leagood                              | Plant biochemistry and molecular biology | John Eiley and Sons                               | 1999 |

**WEB SOURCES:**

- [http://www.biology.arizona.edu/cell\\_bio/cell\\_bio.html](http://www.biology.arizona.edu/cell_bio/cell_bio.html)
- [https://ecok.libguides.com/biology/web\\_sources](https://ecok.libguides.com/biology/web_sources)
- <https://www.nicholls.edu/biol-ds/biol155/Lectures/Cell%20Biology.pdf>
- <http://www.bio-nica.info/Biblioteca/Bolsover2004CellBiology.pdf>

**SYLLABUS DESIGNER:**

- Dr.V.Prabha, Head & Assistant Professor of Bio-Chemistry
- Dr.S.Asha, Assistant Professor of Bio-Chemistry

**CORE PRACTICAL I****QUANTITATIVE ANALYSIS & BIOCHEMICAL TECHNIQUES**

| Sem | Sub. Code | Category | Lecture   |           | Theory    |           | Practical |           | Credits |
|-----|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
|     |           |          | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. |         |
| II  |           | Core     | -         | -         | -         | -         | 5         | 60        | 5       |

**A. Quantitative Analysis**

1. Estimation of Vitamin C.
2. Estimation of inorganic phosphorus by Fiske and Subbarow method.
3. Determination of Pyruvate.
4. Determination of protein by Lowry's method.
5. Determination of Tryptophan.

6. Estimation of sodium and potassium by flame photometry.
7. Estimation of Glucose-by-OT method.
8. Estimation of Iron by Ramsay's Dipyrindyl method.
9. Analysis of Water

#### **B. Techniques**

1. Preparation of buffers and measurement of pH using indicators and pH meter
2. Separation of amino acids and sugars by paper chromatography
3. Separation of amino acids sugars and lipids by thin layer chromatography
4. Separation of plant pigments by column chromatography
5. Separation of serum proteins by PAGE
6. Separation of DNA by Agarose gel Electrophoresis (Demo)

#### **REFERENCE BOOKS:**

| S.No | Author Name                 | Title of the Book                      | Publisher                           | Year                           |
|------|-----------------------------|--|-------------------------------------|--------------------------------|
| 1.   | S.K.Sawhney                 | Introduction to Practical Biochemistry | Alpha science international Ltd.,   | 2 <sup>nd</sup> edition (2005) |
| 2.   | A. Sadasivam and A.Manickam | Biochemical techniques                 | New age international publisher     | 2003                           |
| 3.   | J. Jayaraman                | Laboratory manual in biochemistry      | New age international Pvt           | 2011                           |
| 4.   | Green and Sambrook          | Laboratory manual in biochemistry      | Cold Spring Harbor Laboratory Press | 4 <sup>th</sup> edition(2012)  |

#### **SYLLABUS DESIGNER:**

- DrV.Prabha, Head & Assistant Professor of Bio-Chemistry
- Dr.S.Asha, Assistant Professor of Bio-Chemistry

#### **CORE PRACTICAL II**

#### **ENZYME KINETIC STUDIES**

| Sem | Sub. Code | Category | Lecture   |           | Theory    |           | Practical |          | Credits |
|-----|-----------|----------|-----------|-----------|-----------|-----------|-----------|----------|---------|
|     |           |          | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem |         |
| II  |           | Core     | -         | -         | -         | -         | 5         | 60       | 5       |



## **COURSE OBJECTIVE:**

- Normally measuring enzyme activity is to determine the amount of enzyme present under defined conditions, so that activity can be compared with normal standard values.
  - To establish importance of enzyme in disease conditions.
1. Subcellular fractionation of organelles from liver cells and identification by marker enzymes.
  2. Activity of acid phosphatase
    - a. Determination of optimum pH.
    - b. Determination of optimum temperature.
    - c. Determination of substrate concentration.
    - d. Determination of specific activity.
  3. Activity of alkaline phosphatase
    - a. Determination of optimum pH.
    - b. Determination of optimum temperature.
    - c. Determination of substrate concentration.
    - d. Determination of specific activity.
  4. Determination of Enzyme activity of total ATPase.
  5. Effect of activators and inhibitors on purified acid phosphatase activity.
  6. Assay of clinically important enzymes
    - a. Assay of serum alkaline phosphatase activity.
    - b. Assay of Serum acid phosphatase activity.
    - c. Assay of Serum alanine aminotransferase activity.
    - d. Assay of Serum aspartate aminotransferase activity.

**TEXT BOOKS:**

| S.NO | AUTHOR                      | TITLE                                     | PUBLISHER                                   | YEAR OF PUBLICATION             |
|------|-----------------------------|---|---|---------------------------------|
| 1    | A. Sadasivam and A.Manickam | Biochemical techniques                    | New international publishers,               | 2 <sup>nd</sup> edition (2003). |
| 2    | J. Jayaraman                | Laboratory manual in biochemistry         | Wiley Eastern                               | 1981                            |
| 3.   | David T.Plummer             | An introduction to Practical Biochemistry | Tata McGraw-Hill Publishing Company Limited | 3 <sup>rd</sup> edition(1988)   |
| 4    | Ramniksood                  | Medical laboratory Technology             | Jaypee                                      | 6 <sup>th</sup> edition(2006)   |

**REFERENCE BOOKS:**

| S.NO | AUTHOR    | TITLE                           | PUBLISHER      | YEAR OF PUBLICATION           |
|------|-----------|---------------------------------|----------------|-------------------------------|
| 1.   | H. Varley | Practical Clinical Biochemistry | CBS Publishers | 4 <sup>th</sup> edition(1988) |

**SYLLABUS DESIGNER:**

- DrV.Prabha, Head & Assistant Professor of Bio-Chemistry.
- Mrs.G.Nithya, Assistant Professor of Bio-Chemistry.

**CORE PRACTICAL III****ESTIMATION OF BIOMOLECULES AND MICROBIAL TECHNIQUES**

| Sem | Sub. Code | Category | Lecture   |           | Theory    |           | Practical |           | Credits |
|-----|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|
|     |           |          | Hrs/ week | Hrs / sem | Hrs/ week | Hrs/ sem. | Hrs/ week | Hrs/ sem. |         |
| II  |           | Core     | -         | -         | -         | -         | 5         | 60        | 5       |

**A. Estimation of biomolecules from animal and plant sources**

1. Estimation of DNA using DPA

2. Estimation of RNA using orcinol reagent.
3. Estimation of sugar by Anthrone method.
4. Estimation of proteins using Bradford method.
5. Estimation of chlorophyll in leaves.
6. Estimation of magnesium from leaves/fruit
7. Estimation of Vitamin C from fruit juice by titration methods.
8. Separation of Lecithin from egg yolk by TLC

**B. Phytochemical Analysis.**

1. Herbal extraction by cold and hot maceration.
2. Qualitative analysis of phytochemicals by standard method.
3. Invitro antioxidant studies of plant extract by DPPH, hydroxyl radical and hydrogen peroxide activity.

**C. Microbial Techniques**

1. Sterilization techniques - Principles, methods - moist heat, dry heat.
2. Preparation of culture media- liquid -Nutrient Broth, solid -Nutrient Agar.
3. Nutrient Agar- plate, slant, deep.
4. Pure culture techniques – streaking and pour plate techniques.
5. Staining techniques – Simple and differential (Gram's staining).

**REFERENCE BOOKS:**

| S.No | Author Name                 | Title of the Book                         | Publisher                       | Year                           |
|------|-----------------------------|---|---------------------------------|--------------------------------|
| 1.   | S.K.Sawhney                 | Introduction to Practical Biochemistry    | Alpha science international Ltd | 2 <sup>nd</sup> edition (2005) |
| 2.   | A. Sadasivam and A.Manickam | Biochemical techniques                    | New age international publisher | 2003                           |
| 3.   | J. Jayaraman                | Laboratory manual in biochemistry         | Wiley Eastern                   | 1981                           |
| 4.   | H. Varley                   | Practical Clinical Biochemistry           | Wiley Eastern                   | 1981                           |
| 5.   | N. Kannan                   | Laboratory Manual in General Microbiology | Panima Publishing Corporation   | 2002                           |

**SYLLABUS DESIGNER:**

- DrV.Prabha, Head & Assistant Professor of Bio-Chemistry
- Dr.S.Asha, Assistant Professor of Bio-Chemistry

## BIOTECHNOLOGY- UG

### B.Sc BIOTECHNOLOGY CBCS PATTERN (W.E.F 2019 ONWARDS)

#### SEMESTER - I

| S. No | Part | Study components      |         | Ins hrs\ week | Cred it   | Title of the paper                         | Maximum marks |      |            |
|-------|------|-----------------------|---------|---------------|-----------|--|---------------|------|------------|
|       |      | Course title          |         |               |           |  | Ci a          | Un i | Tot al     |
| 1     | I    | Language              | Paper I | 6             | 4         | Tamil –I                                   | 25            | 75   | 100        |
| 2     | II   | English               | Paper I | 6             | 4         | English - I                                | 25            | 75   | 100        |
| 3     | III  | Core theory           | Paper I | 5             | 5         | Concepts in biotechnology                  | 25            | 75   | 100        |
| 4     | III  | Core practical        | Prac I  | 3             | 0         | Concepts in biotechnology and Cell biology | 0             | 0    | 0          |
| 5     | III  | Allied theory         | Paper I | 5             | 4         | Biochemistry                               | 25            | 75   | 100        |
| 6     | III  | Allied practical      | Prac I  | 3             | 0         | Biochemistry and microbiology              | 0             | 0    | 0          |
| 7     | IV   | Environmentalstu dies |         | 2             | 2         | Environmental studies                      | 25            | 75   | 100        |
|       |      | <b>Total</b>          |         | <b>30</b>     | <b>19</b> |  |               |      | <b>500</b> |

#### SEMESTER - II

| S.No | Part | Study components |          | Ins hrs \week | Credit | Title of the paper                         | Maximum marks |     |       |
|------|------|------------------|----------|---------------|--------|--|---------------|-----|-------|
|      |      | Course title     |          |               |        |  | Cia           | Uni | Total |
| 8    | I    | Language         | Paper II | 5             | 4      | Tamil - II                                 | 25            | 75  | 100   |
| 9    | II   | English          | Paper II | 4             | 4      | English -II                                | 25            | 75  | 100   |
| 10   | III  | Core theory      | Paper II | 5             | 5      | Cell biology                               | 25            | 75  | 100   |
| 11   | III  | Core practical   | Prac I   | 3             | 3      | Concepts in biotechnology and Cell biology | 40            | 60  | 100   |
| 12   | III  | Allied theory    | Paper II | 5             | 4      | Microbiology                               | 25            | 75  | 100   |

|    |     |                  |        |           |           |                               |    |    |            |
|----|-----|------------------|--------|-----------|-----------|-------------------------------|----|----|------------|
| 13 | III | Allied practical | Prac I | 3         | 2         | Biochemistry and microbiology | 40 | 60 | 100        |
| 14 | IV  |                  |        | 3         | 2         | Value education               |    | 50 | 50         |
| 15 | IV  | Soft skills      |        | 2         | 1         | Soft skills                   |    | 50 | 50         |
|    |     | <b>Total</b>     |        | <b>30</b> | <b>25</b> |                               |    |    | <b>700</b> |

### SEMESTER - III

| S.No | Part | Study components |           | Ins hrs \week | Credit    | Title of the paper                 | Maximum marks |     |            |
|------|------|------------------|-----------|---------------|-----------|------------------------------------|---------------|-----|------------|
|      |      | Course title     |           |               |           |                                    | Cia           | Uni | Total      |
| 16   | I    | Language         | Paper III | 6             | 4         | Tamil - II                         | 25            | 75  | 100        |
| 17   | II   | English          | Paper III | 6             | 4         | English -II                        | 25            | 75  | 100        |
| 18   | III  | Core theory      | Paper III | 4             | 4         | Immunology                         | 25            | 75  | 100        |
| 19   | III  | Core practical   | Prac II   | 3             | 0         | Immunology and genetic engineering | 0             | 0   | 0          |
| 20   | III  | Allied theory    | Paper III | 4             | 4         | Molecular genetics                 | 25            | 75  | 100        |
| 21   | III  | Allied practical | Prac II   | 3             | 0         | Molecular geneticsand Enzymology   | 0             | 0   | 0          |
| 22   | IV   | Skill based      | Paper I   | 2             | 2         | Molecular Diagnostics - I          |               | 50  | 50         |
| 23   | IV   | Non-major        | Paper I   | 2             | 2         | Organic farming                    |               | 50  | 50         |
|      |      | <b>Total</b>     |           | <b>30</b>     | <b>20</b> |                                    |               |     | <b>500</b> |

### SEMESTER - IV

| S.No | Part | Study components |             | Ins<br>hrs \ week | Credit | Title of the<br>paper | Maximum<br>marks |     |       |
|------|------|------------------|-------------|-------------------|--------|-----------------------|------------------|-----|-------|
|      |      | Course title     |             |                   |        |                       | Cia              | Uni | Total |
| 24   | I    | Language         | Paper<br>IV | 6                 | 4      | Tamil - II            | 25               | 75  | 100   |
| 25   | II   | English          | Paper<br>IV | 6                 | 4      | English -II           | 25               | 75  | 100   |
| 26   | III  | Core theory      | Paper       | 4                 | 4      | Genetic               | 25               | 75  | 100   |

|    |     |                  |          |           |           |                                    |                   |    |            |
|----|-----|------------------|----------|-----------|-----------|------------------------------------|-------------------|----|------------|
|    |     |                  | IV       |           |           | engineering                        |                   |    |            |
| 27 | III | Core practical   | Prac II  | 3         | 3         | Immunology and genetic engineering | 40                | 60 | 100        |
| 28 | III | Allied theory    | Paper IV | 4         | 4         | Enzymology                         | 25                | 75 | 100        |
| 29 | III | Allied practical | Prac II  | 3         | 2         | Molecular genetics and Enzymology  | 40                | 60 | 100        |
| 30 | IV  | Skill based      | Paper II | 2         | 2         | Molecular Diagnostics - II         | 0                 | 50 | 50         |
| 31 | IV  | Non-major        | Paper II | 2         | 2         | Kitchen & rooftop gardening        | 0                 | 50 | 50         |
|    |     | <b>Total</b>     |          | <b>30</b> | <b>25</b> |                                    |                   |    | <b>700</b> |
| 32 |     | Optional         |          |           | 1         | Internship                         | Report submission |    |            |

#### SEMESTER V

| S.No | Part | Study components |           | Ins hrs \ week | Credit    | Title of the paper                 | Maximum marks |     |            |
|------|------|------------------|-----------|----------------|-----------|------------------------------------|---------------|-----|------------|
|      |      | Course title     |           |                |           |                                    | Cia           | Uni | Total      |
| 33   | III  | Core theory      | Paper V   | 6              | 5         | Plant & agricultural biotechnology | 25            | 75  | 100        |
| 34   | III  | Core theory      | Paper VI  | 6              | 4         | Animal cell culture                | 25            | 75  | 100        |
| 35   | III  | Core theory      | Paper VII | 5              | 4         | Biophysics & biostatistics         | 25            | 75  | 100        |
| 37   | III  | Elective         | Paper I   | 4              | 3         | Developmental biology              | 25            | 75  | 100        |
| 38   | III  | Elective         | Paper II  | 4              | 3         | Bioinformatics                     | 25            | 75  | 100        |
| 39   | III  | Core practical   | Prac III  | 3              | 3         | Plant and Animal cell culture      | 40            | 60  | 100        |
| 40   | IV   | Skill based      | Paper III | 2              | 2         | Bio – business and management      | 0             | 50  | 50         |
|      |      | <b>Total</b>     |           | <b>30</b>      | <b>24</b> |                                    |               |     | <b>650</b> |

## SEMESTER VI

| S.No | Part | Study components   |            | Ins hrs\week | Credit    | Title of the paper                        | Maximum marks |             |            |
|------|------|--------------------|------------|--------------|-----------|---|---------------|-------------|------------|
|      |      | Course title       |            |              |           |   | CI A          | Univ . Exam | Total      |
| 41   | III  | Core theory        | Paper VIII | 6            | 5         | Microbial and industrial biotechnology    | 25            | 75          | 100        |
| 42   | III  | Core theory        | Paper IX   | 6            | 4         | Pharmaceutics & Herbal medicine           | 25            | 75          | 100        |
| 43   | III  | Core theory        | Paper X    | 5            | 4         | Bioinstrumentation                        | 25            | 75          | 100        |
| 44   | III  | Elective           | Paper III  | 4            | 3         | Medical biotechnology                     | 25            | 75          | 100        |
| 45   | III  | Elective           | Paper IV   | 4            | 3         | Environmental biotechnology               | 25            | 75          | 100        |
| 46   | III  | Core practical     | Prac III   | 3            | 3         | Bioprocess & Pharmaceutical Biotechnology | 40            | 60          | 100        |
| 47   | IV   | Skill based        | Paper IV   | 2            | 2         | IPR & Ethics in biotechnology             | 0             | 50          | 50         |
| 48   | V    | Extension activity |            |              | 3         |   |               |             |            |
|      |      | <b>Total</b>       |            | <b>30</b>    | <b>27</b> |   |               |             | <b>750</b> |

**Note:** The extra credit for internship and miniproject will be included in the mark sheet and it will not be included in the total credits 140

| PART       | SUBJECT         | PAPER | CREDITS          | TOTAL CREDITS | MARKS | TOTAL MARKS |
|------------|-----------------|-------|------------------|---------------|-------|-------------|
| <b>I</b>   | Tamil           | 4     | 4                | 16            | 100   | 400         |
| <b>II</b>  | English         | 4     | 4                | 16            | 100   | 400         |
| <b>III</b> | Allied Odd Sem  | 2     | 4                | 8             | 100   | 200         |
| <b>III</b> | Allied Even Sem | 2     | 4                | 8             | 100   | 200         |
| <b>III</b> | Allied Pract    | 2     | 2                | 4             | 100   | 200         |
| <b>III</b> | Electives       | 4     | 3                | 12            | 100   | 400         |
| <b>III</b> | Core            | 10    | 4x5=20<br>6x4=24 | 44            | 100   | 1000        |

|            |                    |   |   |            |     |             |
|------------|--------------------|---|---|------------|-----|-------------|
| <b>III</b> | Core Pract         | 4 | 3 | 12         | 100 | 400         |
| <b>IV</b>  | Env Sci            | 1 | 2 | 2          | 100 | 100         |
| <b>IV</b>  | Soft Skill         | 1 | 1 | 1          | 50  | 50          |
| <b>IV</b>  | Value Edu          | 1 | 2 | 2          | 50  | 50          |
| <b>IV</b>  | Nme                | 2 | 2 | 4          | 50  | 100         |
| <b>IV</b>  | Skill Based        | 4 | 2 | 8          | 50  | 200         |
| <b>V</b>   | Extension Activity | 1 | 3 | 3          | 100 | 100         |
|            | <b>TOTAL</b>       |   |   | <b>140</b> |     | <b>3800</b> |

### PROGRAM EDUCATIONAL OBJECTIVES

PEO 1 – Provide robust rationale in core biotechnology courses to produce biotechnology graduates who will be employable in core Biotech/Pharma industries where they could evaluate and propose biotechnological solutions with economical and social viability

PEO 2 – Sensitize on environmental, health and bioethical issues, Intellectual property rights, professional ethics and life-long learning through application orientated activities

### PROGRAM OUTCOMES

PO1 To provide basic understanding and knowledge on the concepts of biotechnology.

PO2 To make the graduates understand the quantum of science in their daily lives.

PO3 To apply the knowledge they gain through their course of study.

PO4 Graduates will be able to think analytically.

PO5 To provide them with competent Evaluation strategies.

PO6 Understanding of professional and ethical responsibility.

### CONCEPTS IN BIOTECHNOLOGY

| Semester | Subject Code | Category | Lecture        |    | Theory         |    | P | C |
|----------|--------------|----------|----------------|----|----------------|----|---|---|
| I        |              | Core     | 5 hrs per week | 75 | 5 hrs per week | 75 | 0 | 5 |



**COURSE OBJECTIVE:**

- To provide students with an introduction to concepts applied in the field of biotechnology from other interdisciplinary subjects such as genetics, molecular biology, biochemistry, applied microbiology and to equip learners with a strong foundation essential for subjects in the later years of the Biotechnology Science Major.

**COURSE OUTCOMES:** Upon successful completion of the course, students will be able to

| CO NUMBER | CO STATEMENT  | KNOWLEDGE LEVEL |
|-----------|---|-----------------|
| CO 1      | Recall the basics of biotechnology and categorize different fields                                | K1 & K2         |
| CO 2      | Demonstrate the use of microbes in biotechnological products                                      | K2              |
| CO 3      | Illustrate the cloning procedures and methods in rDNA technology                                  | K3              |
| CO 4      | Correlate and differentiate plant and animal cell lines and its usage in agriculture and medicine | K4              |
| CO 5      | Interpret the sequence analysis through bioinformatics tools.                                     | K2              |

**Knowledge level:** K1- Remember; K2- Understand; K3- Apply; K4- analyze

**MAPPING WITH PROGRAMME OUTCOMES**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | M   | S   | S   |
| CO2 | S   | S   | S   | M   | M   | M   |
| CO3 | M   | S   | S   | S   | M   | M   |
| CO4 | S   | S   | M   | S   | M   | S   |
| CO5 | M   | M   | S   | M   | S   | S   |

S-strong; M- medium; L-low

**UNIT 1 Introduction to Biotechnology****(10hrs)**

Definition of biotechnology, History and contributions of scientists, scope in multidisciplinary fields of biotechnology, whole organisms to nano level, stem cells, genetic engineering.

**UNIT II      Microbial Culture and Applications      (10hrs)**

Introduction, Microbial Culture Techniques, Measurement and Kinetics of Microbial Growth, Isolation of Microbial Products, Applications of Microbial Culture Technology, Bioethics in Microbial Technology.

**UNIT III      Cloning and Genetic Engineering      (10hrs)**

Introduction, Tools of rDNA Technology, Making Recombinant DNA, Introduction of Recombinant DNA into host cells, Identification of Recombinants, Polymerase Chain Reaction (PCR), DNA Probes, Hybridization Techniques, DNA Sequencing, Site-directed mutagenesis.

**UNIT IV      Biotechnology in Medicine and Agriculture      (10hrs)**

Introduction, Cell and Tissue Culture Techniques, Applications of Cell and Tissue Culture, Gene Transfer Methods in Plants, Transgenic Plants with Beneficial Traits, Animal Cell Culture Techniques, Characterization of Cell Lines, Applications of Animal Cell Culture.

**UNIT V      Genomics and Proteomics      (10hrs)**

Introduction to the world of genomes, bioinformatics, DNA sequence and structural databases, Proteins databases, 3-D Shape of Proteins, Protein based products, Designing Proteins, Proteomics, Microarrays.

**TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars
- Models and charts

**TEXT BOOKS:**

| S.No | Authors           | Title                     | Publishers         | Year of Publication |
|------|-------------------|---------------------------|--------------------|---------------------|
| 1.   | D Balasubramaniam | Concepts in Biotechnology | Universities Press | 2016                |

**REFERENCE BOOKS:**

| S.No | Authors                           | Title                        | Publishers                               | Year of Publication |
|------|-----------------------------------|------------------------------|--|---------------------|
| 1.   | Raies A. Qadri,<br>Javid Pararray | Concepts of<br>Biotechnology | LAP<br>LAMBERT<br>Academic<br>Publishing | 2011                |

**WEB RESOURCES:**

1. <https://opentextbc.ca/biology/>
2. <http://ocw.osaka-u.ac.jp/engineering/biotechnology-fundamentals>

**Syllabus Designer: Dr. Vinita Ernest**

**Assistant professor**

**BIOCHEMISTRY**

| Semester | Subject Code | Category | Lecture        |    | Theory         |    | P | C |
|----------|--------------|----------|----------------|----|----------------|----|---|---|
| I        |              | Allied   | 5 hrs Per week | 75 | 5 hrs Per week | 75 | 0 | 4 |

**COURSE OBJECTIVE:**

- To understand the structure of biomolecules, metabolism and their functions and the energy to flow in biological system and catalytic functions of enzymes

**COURSE OUTCOMES:** Up on successful completion of the course, students will be able to

| CO NUMBER | CO STATEMENT   | KNOWLEDGE LEVEL ( K1-K4) |
|-----------|--|--------------------------|
| CO1.      | To describe the structure and interactions in aqueous solutions and understand about body fluids | K1, K2                   |
| CO2.      | Identify and interpret the structure, classification, of carbohydrates, amino acids and lipids   | K2                       |
| CO3.      | To understand analyze metabolism of carbohydrates and proteins.                                  | K2, K4                   |
| CO4.      | To know about bioenergetics and understand the functions of enzymes and classification           | K2                       |

|      |  |    |
|------|--|----|
| CO5. | To understand the structure and classification of vitamins | K2 |
|------|--|----|

**Knowledge level:** K1- Remember; K2- Understand; K3- Apply; K4- analyze

### MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | M   | M   | M   |
| CO2 | M   | S   | M   | M   | M   | M   |
| CO3 | M   | M   | S   | S   | M   | S   |
| CO4 | S   | M   | M   | S   | M   | S   |
| CO5 | S   | S   | M   | M   | M   | M   |

S-strong;

M- medium;

L-low

### UNIT 1: Biological Fluids

(12 hrs)

**Water** – Biological importance, physical properties, structure, Interactions in aqueous solution; pH and buffers- Acid – Base balance, Biological importance of Buffers, Acidosis and alkalosis. Electrolyte and water balance.

Body fluids – Milk, Colostrum, amniotic fluid and CSF

### UNIT 2: Biomolecules

(12 hrs)

**Carbohydrates** – Classification of carbohydrates – Structure and properties of mono, di and polysaccharides in plants, cellulose, starch and pectins.

**Amino Acids:** Structure, Classification of amino acids and properties. Proteins: structure classification and properties Nucleic acids – structure of phosphoric acid, pentose sugar, nucleotides.

**Lipids** – Classification of lipids. Structure and properties of fatty acids, fatty oil, Glycerolipids, phospholipids, sphingolipids, glycolipids, and steroids.

### UNIT 3: Metabolism

(15 hrs)

**Digestion of carbohydrates** – Glycolysis, TCA Cycle, HMP shunt, Oxidative phosphorylation. Digestion of lipids – beta – oxidation of fatty acids.

**Digestion of proteins** – Transamination, oxidative and non oxidative deamination – Mechanism of photosynthesis

**UNIT 4: Bioenergetics & Catalysis****(12hrs)**

**Bioenergetics** – Free energy, laws of thermodynamics – enthalpy and entropy – redox potential.

**Enzyme** – Definition and classification, active site, apoenzyme, coenzyme and isoenzyme, mechanism of enzyme action.

**UNIT 5: Vitamins and Deficiency****(9 hrs )**

**Water and Lipid soluble Vitamins** – Structure, classification, sources and deficiencies in man.

**TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars
- Models and charts

**TEXT BOOKS:**

| S.no. | Authors   | Title                        | Publishers                        | Year of publication |
|-------|-----------|------------------------------|-----------------------------------|---------------------|
| 1.    | J.L. Jain | Fundamentals of Biochemistry | S. Chand & Company, Limited       | 2016                |
| 2.    | A.C. Deb  | Fundamentals of Biochemistry | New Central Book Agency (P) Ltd   | 2017                |
| 3.    | G. Zubay  | Biochemistry                 | Macmillan Publishing Co, New York | 2010                |

**REFERENCE BOOKS:**

| S.No. | Authors                                  | Title                      | Publishers                 | Year of publication |
|-------|--|----------------------------|----------------------------|---------------------|
| 1.    | A.L. Lehninger., D.L Nelson and M.M. Cox | Principles of Biochemistry | Worth Publishers, New York | 2016                |
| 2.    | L. Stryer                                | Biochemistry               | W.H. Freeman and Company   | 2012                |

|    |                     |              |                               |      |
|----|---------------------|--------------|-------------------------------|------|
|    |                     |              |                               |      |
| 3. | D. Voet & J.G. Voet | Biochemistry | Hoboken, N.J.:J. Wiley & Sons | 2016 |

**WEB SOURCES:**

1. <http://www.biologydiscussion.com/metabolism/carbohydrates-metabolism/metabolism-of-carbohydrates-10-cycles-with-diagram/11242>
2. <https://nptel.ac.in/courses/112105129/pdf/RAC%20Lecture%204.pdf>
3. [http://ocw.ump.edu.my/pluginfile.php/9893/mod\\_resource/content/1/Nucleic%20Acid%20Metabolism.pdf](http://ocw.ump.edu.my/pluginfile.php/9893/mod_resource/content/1/Nucleic%20Acid%20Metabolism.pdf)
4. [http://elearning.vtu.ac.in/moodle2/pluginfile.php/101/mod\\_folder/content/0/10BT43/Biomolecular%20%20%20Interactions.pdf?forcedownload=1](http://elearning.vtu.ac.in/moodle2/pluginfile.php/101/mod_folder/content/0/10BT43/Biomolecular%20%20%20Interactions.pdf?forcedownload=1)

**Syllabus Designer: Dr. C. Suganthi**

**Assistant Professor**

**CELL BIOLOGY**

| Semester | Subject Code | Category | Lecture        |    | Theory         |    | P | C |
|----------|--------------|----------|----------------|----|----------------|----|---|---|
| II       |              | Core     | 5 hrs Per week | 75 | 5 hrs Per week | 75 | 0 | 5 |

**COURSE OBJECTIVE:**

- To understand the basics, characteristics and functions of cell types, cell organelles and investigate the cell division, cytoskeleton and study the interaction between cells or with the environment and learn the principles of signaling mechanisms.

**COURSE OUTCOMES:** Up on successful completion of the course, students will be able to

| CO NUMBER | CO STATEMENT  | KNOWLEDGE LEVEL ( K1-K4) |
|-----------|---|--------------------------|
| CO1.      | Remember cells as the basic units of all living things and as the building blocks of multi-cellular organisms and Understand different Cell types and functions of cell organelles. | K1, K2                   |
| CO2.      | Apply their knowledge by comparing how structures of cell and its organelles are related to their functions.  | K3                       |
| CO3.      | Analyze how cells reproduce by cell cycle, mitosis and meiosis.   | K4                       |

|      |  |        |
|------|--|--------|
| CO4. | Understand the fundamental structures and functions of cytoskeleton which gives motility to cells.                             | K2     |
| CO5. | Identify and understand the principles of interaction between cells and environment and to determine cell signalling pathways. | K1, K2 |

**Knowledge level:** K1- Remember; K2- Understand; K3- Apply; K4- analyze

#### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | M          | S          | M          |
| <b>CO2</b> | S          | S          | S          | M          | M          | S          |
| <b>CO3</b> | S          | S          | S          | M          | M          | M          |
| <b>CO4</b> | S          | S          | M          | M          | S          | M          |
| <b>CO5</b> | S          | S          | S          | S          | M          | S          |

S-strong; M- medium; L-low

#### **UNIT I      Cell as Basic Unit      (10hrs)**

Discovery of cells, cell theory, properties of cells, two different types of cells- prokaryotes and eukaryotes, types of prokaryotic cells- bacteria and archaea, eukaryotic cells- plant cell, animal cell and viruses, human cells types, blood cells- RBCs and WBCs.

#### **UNIT II      Membranes and Organelles      (15 hrs)**

Structure and function of cell organelles- plasma membrane, cell wall, mitochondria, cytoplasm, golgi complex, lysosomes, vacuoles, peroxisomes, endoplasmic reticulum, ribosomes, chloroplast, nucleus- chromosomes and types.

#### **UNIT III      Cell reproduction      (15 hrs)**

Cell cycle- Mitosis and Meiosis and its different phases, asexual and sexual reproduction, vegetative reproduction, binary fission, budding.

#### **UNIT IV      Cytoskeleton and cell motility      (15 hrs)**

Cytoskeleton structures and functions- microtubules, microfilaments and intermediate filaments, centrioles and basal bodies, cilia and flagella, muscle contractility, non muscle motility.

#### **UNIT V      Interaction between cells and environment and cell signalling (20 hrs)**

Extracellular matrix, interaction of cell with extracellular matrix-integrins, hemidesmosomes, interaction of cells with other cells-selectins, immunoglobulin super family, cadherins, adherens and desmosomes, Tight junctions, Gap junctions and plasmadesmata, signal transduction by G-Protein coupled receptor, Ras MAP Kinase pathway, signaling by insulin receptor, apoptosis- intrinsic and extrinsic pathway. signaling pathways in plants.

**Distribution of Marks:** Theory 80% and Problems 20%

**TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars
- Models and charts

**TEXT BOOKS:**

| S.no. | Authors   | Title                  | Publishers                              | Year of publication |
|-------|---|------------------------|---|---------------------|
| 1.    | <a href="#">Harvey Lodish</a> , <a href="#">Arnold Berk</a> , <a href="#">Chris A. Kaiser</a> , <a href="#">Monty Krieger</a> | Molecular Cell biology | W.H. Freeman and Company, New York, USA | 2016                |
| 2.    | <a href="#">P.S. Verma</a> & <a href="#">V K Agarwal</a>  | Cytology               | S.Chand Publishing, New Delhi, India.   | 2010                |

**REFERENCE BOOKS:**

| S.no. | Authors                               | Title   | Publishers                         | Year of publication |
|-------|---------------------------------------|---|------------------------------------|---------------------|
| 1.    | Gerald Karp                           | Cell and Molecular Biology: concepts and experiments: | John Wiley and sons, Inc., NJ.     | 2015                |
| 2.    | Geoffrey M Cooper, E. Robert Hausman, | Cell: a molecular approach                            | Sinauer Associates Inc, Publishers | 2013                |



|    |   |                        |                                       |      |
|----|---|------------------------|---------------------------------------|------|
|    |   |                        | Sunderland,<br>Massachusetts<br>U.S.A |      |
| 3. | <a href="#">Harvey Lodish</a> , <a href="#">Arnold Berk</a> , <a href="#">Chris A. Kaiser</a> , <a href="#">Monty Krieger</a> , <a href="#">Anthony Bretscher</a> , Hidde Ploegh; Angelika Amon; Kelsey C. Martin | Molecular cell biology | W.H. Freeman publishers & Co.         | 2016 |

### WEB SOURCES:

1. <https://www2.le.ac.uk/projects/vgec/highereducation/topics/cellcycle-mitosis-meiosis>
2. <https://www2.le.ac.uk/projects/vgec/highereducation/topics/dna-genes-chromosomes>
3. <https://www.nap.edu/read/19207/chapter/8#34>
4. <https://www.khanacademy.org/test-prep/mcat/cells/cell-cell-interactions/a/cell-cell-interactions-how-cells-communicate-with-each-other>
5. [https://www.youtube.com/watch?v=S-Kj2FR\\_6\\_g](https://www.youtube.com/watch?v=S-Kj2FR_6_g)
6. <https://www.toppr.com/guides/biology/the-fundamental-unit-of-life/cell-organelle/>

**Syllabus Designer : Dr. D. Charumathi**

**Assistant Professor**

### MICROBIOLOGY

| Semester | Subject Code | Category | Lecture              |    | Theory               |    | P | C |
|----------|--------------|----------|----------------------|----|----------------------|----|---|---|
| II       |              | Allied   | 5 hrs<br>per<br>week | 75 | 5 hrs<br>per<br>week | 75 | 0 | 4 |

**COURSE OBJECTIVES:**

- To provide education in Microbiology to aspiring learners. The course is to ensure that the students at the end of the programme are able to acquire higher education further leading to prospective career.

**COURSE OUTCOME:** After completion of the course students will be able to

| CO Number | CO Statement  | Knowledge level k1 – k4 |
|-----------|---|-------------------------|
| CO1       | Recall the history and classification of microbes.  | K2                      |
| CO2       | Evaluate the structure of microbes and microscopy.  | K5                      |
| CO3       | Apply the different methods of sterilization; types of media and pure culture techniques                    | K3                      |
| CO4       | Differentiate the dynamics of microbial interactions with other populations and analyze the human diseases. | K4                      |
| CO5       | Apply the aspects of microbiology.  | K3                      |

**Knowledge level:** K1- Remember; K2- Understand; K3- Apply; K4- analyze  
**MAPPING WITH PROGRAM OUTCOMES:**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | M   | M   | M   |
| CO2 | S   | S   | S   | M   | S   | S   |
| CO3 | S   | S   | S   | M   | M   | M   |
| CO4 | S   | M   | S   | S   | S   | S   |
| CO5 | M   | M   | S   | S   | S   | S   |

S-strong; M- medium; L-low

**UNIT I: Overview of history of Microbiology****(15 hrs)**

Biogenesis and abiogenesis, Contributions of Spallanzani, Pasteur, Tyndal, Joseph Lister, Koch [Germ Theory], Edward Jenner and Flemming [Penicillin]. Scope of Microbiology. Classification of Microbes – Five kingdom concept, three kingdom concept. Bergey's manual of classification (2<sup>nd</sup> edition).

**UNIT II: Ultra structure of microbes and microscopy:****(15 hrs)**

A detailed account of General structure, growth and reproduction of Bacteria, fungi and Virus.

Basic principles in microscopy, Types of microscopes- light, dark, phase contrast, fluorescent and electron microscope- (Transmission and Scanning electron)

**UNIT III: Microbiological Media and culture techniques:****(15 hrs)**

Culture and media preparation – solid and liquid. Types of media – semi synthetic, synthetic, enriched, enrichment, selective and differential media., Sterilization and disinfection – principles – methods of sterilization – physical methods – dry heat – moist heat – radiation – filtration (membrane and HEPA) – chemical sterilization – chemical agents – mode of action.

Preservation and maintenance of culture ; Pure culture techniques – tube dilution, pour, spread, streak plate. Anaerobic cultivation of bacteria. Stains and staining techniques –

Mechanism of gram staining, acid fast staining, negative staining, capsule staining, flagella staining, endospore staining.

**UNIT IV: Physiology and biochemistry of microbes and human diseases: (15 hrs )**

Photo-autotrophs, Chemo-autotrophs, Parasitism, Saprophytism, Mutualism and Symbiosis, Commensalisms, endozoic microbes. Nitrogen metabolism including Nitrogen fixation (Symbiotic and asymbiotic)

**Pathogenic Microorganisms:**

(A) Bacterial diseases of man – Tetanus, Tuberculosis, Pneumonia and Cholera. (B) Viral diseases: AIDS (HIV).

**UNIT V: Microbial applications:**

In medicine – antibiotics; penicillin and streptomycin. In agriculture; Bio-fertilizer (bacteria and cyanobacteria). In food and dairy industries; microbial bio-products ( SCP, bio-pigments, yeast products and enzymes). Economic and industrial importance of yeast and moulds. Biosensors.

**TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars
- Models and charts

**TEXT BOOKS:**

| S.no | Authors                                | Title                     | Publishers         | Year of publication |
|------|--|---------------------------|--------------------|---------------------|
| 1    | R. Anandanarayanan and C.K.J. Paniker. | Text book of Microbiology | Universities press | 2010                |
| 2    | Pelczar.M.,etal.,                      | Microbiology              | Tata-McGraw Hill   | 2013                |

**REFERENCE BOOKS:**

| S.no | Authors         | Title               | Publishers                          | Year of publication |
|------|-----------------|---------------------|-------------------------------------|---------------------|
| 1    | Prescott        | Microbiology        | McGraw Hill Education               | 2012                |
| 2    | Edward A. Birge | Modern Microbiology | Wm.C. Brown Publishers, Inc. U.S.A. | 1992                |

**WEB SOURCES:**

- [http://www.microrao.com/micronotes/pg/culture\\_media.pdf](http://www.microrao.com/micronotes/pg/culture_media.pdf)
- <http://library.open.oregonstate.edu/microbiology/chapter/introduction-to-microbiology/>
- [http://microbiology.ukzn.ac.za/Libraries/MICR304/CULTURE\\_PROCEDURES.sflb.ashx](http://microbiology.ukzn.ac.za/Libraries/MICR304/CULTURE_PROCEDURES.sflb.ashx)
- <https://www.docsity.com/en/host-parasite-interactions-microbiology-lecture-slides/232518/>
- <https://www.studocu.com/en/document/university-of-southern-queensland/medical-microbiology-and-immunology-1/lecture-notes/lecture-notes-1-to-23/319412/view>
- <http://www.teilar.gr/dbData/ProfAnn/profann-f2bc2d4d.pdf>

**Syllabus Designer: Mrs. S. Akhila**

**Assistant Professor**

**BASIC TECHNIQUES IN BIOTECHNOLOGY AND CELL BIOLOGY**

| Semester | Subject Code | Category       | Lecture | Theory | Practical            | Credit |
|----------|--------------|----------------|---------|--------|----------------------|--------|
| I/II     |              | Core Practical | 0       | 0      | 6 hrs per week<br>90 | 3      |

**COURSE OBJECTIVES:**

- To create an opportunity to students for experimentally testing the principles and concepts studied in respective theory.

**EXPERIMENT LISTS:**

1. General safety rules and regulations in Laboratory
2. Microscopy and micrometry
3. Handling Pipettes (Micropipettes)
4. Performing Dilutions
5. Buffer Preparation
6. Colorimetry
7. Buccal smear preparation.
8. Mitosis in onion root tip cells.
9. Meiosis in Grasshopper testis- Demo.
10. Cell fractionation by centrifugation.
11. WBC and RBC count using Hemocytometer.

**REFERENCE BOOKS**

1. [https://www.bjcancer.org/Sites\\_OldFiles/\\_Library/UserFiles/pdf/Cell\\_Biology\\_Laboratory\\_Manual.pdf](https://www.bjcancer.org/Sites_OldFiles/_Library/UserFiles/pdf/Cell_Biology_Laboratory_Manual.pdf)
2. [http://olimpiade.pasma.kemdikbud.go.id/index/SOAL/SOAL%20OLIMPIADE%20SAINS\\_2012/SOAL%20SOLUSI%20OSN\\_12/5.%20Biologi/Praktikum%20Biologi%20Sel%20&%20Molekuler/241labmanu\\_fall07\\_08\(1\).pdf](http://olimpiade.pasma.kemdikbud.go.id/index/SOAL/SOAL%20OLIMPIADE%20SAINS_2012/SOAL%20SOLUSI%20OSN_12/5.%20Biologi/Praktikum%20Biologi%20Sel%20&%20Molekuler/241labmanu_fall07_08(1).pdf)
3. <http://www.dbtindia.nic.in/wp-content/uploads/E-MANUAL.pdf>

**BIOCHEMISTRY AND MICROBIOLOGY**

| Semester | Subject Code | Category         | Lecture | Theory | Practical      |    | Credit |
|----------|--------------|------------------|---------|--------|----------------|----|--------|
| I/II     |              | Allied Practical | 0       | 0      | 6 hrs per week | 90 | 3      |

**COURSE OBJECTIVES:**

- To get basic knowledge about the microbial techniques in an aseptic environment and demonstrate competency in documenting laboratory results.

The students should be able to understand, media preparation, sterilization procedures, isolation and pure culture techniques

#### EXPERIMENT LISTS:

1. Qualitative analysis of carbohydrates (Glucose, Fructose, Lactose, Xylose, and Starch)
2. Qualitative analysis of aminosoids (Tyrosine, Tryptophan, Histidine, Arginine, Methionine)

#### Quantitative Analysis:

3. Colorimetric estimation of proteins by Lowry's method
4. Colorimetric estimation of DNA by Diphenyl amine method
5. Estimation of glycine by formal titration method
6. Estimation of ascorbic acid using dichlorophenol indophenols as link solution
7. Media preparation and sterilization
8. Isolation and Enumeration of microorganism – Spread and Pour
9. Observation of Colony morphology and Characteristics
10. Pure culture technique – Streaking techniques (Simple, T-streak & Quadrant)
11. Measurement of growth of bacteria
12. Antibiotic sensitivity test -Kirby Bauer method

#### REFERENCE BOOKS

<http://www.dbtindia.nic.in/wp-content/uploads/E-MANUAL.pdf>

## **BIOTECHNOLOGY -PG**

### **M. Sc. BIOTECHNOLOGY CBCS PATTERN (W.E.F 2019 ONWARDS)**

#### **SEMESTER - I**

| S.N<br>o | Study components  |                  | Ins<br>hrs\wee<br>k | Credi<br>t | Title of the paper              | Maximum marks |         |           |
|----------|-------------------|------------------|---------------------|------------|---------------------------------|---------------|---------|-----------|
|          | Course title      |                  |                     |            |                                 | CI<br>A       | UN<br>I | TOTA<br>L |
| 1        | Core              | Paper I          | 5                   | 5          | Cell and molecular<br>biology   | 25            | 75      | 100       |
| 2        | Core              | Paper II         | 5                   | 5          | Biomolecular<br>interactions    | 25            | 75      | 100       |
| 3        | Core              | Paper III        | 5                   | 5          | Microbiology                    | 25            | 75      | 100       |
| 4        | Elective I        | Paper I          | 3                   | 3          | Bioinstrumentatio<br>n          | 25            | 75      | 100       |
| 5        | Core<br>practical | Core<br>practica | 4                   | 0          | Cell & molecular<br>biology and | 0             | 0       | 0         |

|   |                        |                        |           |           |   |   |   |            |
|---|------------------------|------------------------|-----------|-----------|---|---|---|------------|
|   |                        | 1 I                    |           |           | Genetic Engineering                             |   |   |            |
| 6 | Core practical         | Core Practica<br>1 II  | 4         | 0         | Biomolecular Interactions and Enzyme Technology | 0 | 0 | 0          |
| 7 | Core Practical         | Core Practica<br>1 III | 4         | 0         | Microbiology and Immunotechnology               | 0 | 0 | 0          |
|   |                        | <b>TOTAL</b>           | <b>30</b> | <b>18</b> |   |   |   | <b>400</b> |
| 8 | Self study (optional ) | Paper I                | 0         | 2         | Evolution & diversity of life                   | 0 | 0 | 0          |

### SEMESTER - II

| S.No | Study components |                    | Ins hrs \week | Credit    | Title of the paper                               | Maximum marks |           |            |
|------|------------------|--------------------|---------------|-----------|--|---------------|-----------|------------|
|      | Course title     |                    |               |           |  | CI A          | Uni Marks | Total      |
| 9    | Core             | Paper IV           | 4             | 4         | Genetic Engineering                              | 25            | 75        | 100        |
| 10   | Core             | Paper V            | 4             | 4         | Enzyme technology                                | 25            | 75        | 100        |
| 11   | Core             | Paper VI           | 5             | 5         | Immunology &Immunotechnology                     | 25            | 75        | 100        |
| 12   | Elective II      | Paper II           | 3             | 3         | Plant and animal physiology                      | 25            | 75        | 100        |
| 13   | Compulsory paper |                    | 2             | 2         | Human rights                                     | 25            | 75        | 100        |
| 14   | Core             | Core practical I   | 4             | 4         | Cell & molecular biology and Genetic Engineering | 40            | 60        | 100        |
| 15   | Core             | Core Practical II  | 4             | 4         | Biomolecular Interactions and Enzyme Technology  | 40            | 60        | 100        |
| 15   | Core             | Core Practical III | 4             | 4         | Microbiology and Immunotechnology                | 40            | 60        | 100        |
|      |                  | <b>TOTAL</b>       | <b>30</b>     | <b>30</b> |  |               |           | <b>800</b> |

### SEMESTER - III

| S.No | Study components     |                   | Ins<br>hrs\week | Cred<br>it | Title of the<br>paper  | Maximum marks |              |            |
|------|----------------------|-------------------|-----------------|------------|--|---------------|--------------|------------|
|      | Course title         |                   |                 |            |  | CIA           | Uni<br>Marks | Total      |
| 17   | Core                 | Paper VII         | 5               | 5          | Transgenic Technology  | 25            | 75           | 100        |
| 18   | Core                 | Paper VIII        | 5               | 5          | Downstream processing  | 25            | 75           | 100        |
| 19   | Core                 | Paper IX          | 5               | 4          | Research methodology and Biostatistics                                 | 25            | 75           | 100        |
| 20   | Elective III         | Paper III         | 3               | 3          | Developmental biology  | 25            | 75           | 100        |
| 21   | Core                 | Core Practical IV | 4               | 0          | Transgenic Technology  | 0             | 0            | 0          |
| 22   | Core                 | Core Practical V  | 4               | 0          | Downstream processing  | 0             | 0            | 0          |
| 23   | Core                 | Core Practical VI | 4               | 0          | Research methodology and Biostatistics and Environmental Biotechnology | 0             | 0            | 0          |
|      |                      | <b>TOTAL</b>      | <b>30</b>       | <b>17</b>  |  |               |              | <b>400</b> |
| 24   | Self study(optional) | Paper II          | 0               | 2          | Neutraceutical and functional foods                                    | 0             | 0            | 0          |

### SEMESTER - IV

| S.No | Study components |         | Ins<br>hrs\week | Credit | Title of the<br>paper                       | Maximum marks |              |       |
|------|------------------|---------|-----------------|--------|---|---------------|--------------|-------|
|      | Course title     |         |                 |        |   | CIA           | Uni<br>Marks | Total |
| 25   | Core             | Paper X | 5               | 5      | Ecology &<br>Environmental<br>biotechnology | 25            | 75           | 100   |



|    |             |                   |           |           |  |    |    |            |
|----|-------------|-------------------|-----------|-----------|--|----|----|------------|
| 26 | Elective IV | Paper IV          | 5         | 3         | Biosafety , IPR & Ethics   | 25 | 75 | 100        |
| 27 | Core        | Core Practical IV | 4         | 4         | Transgenic Technology  | 40 | 60 | 100        |
| 28 | Core        | Core Practical V  | 4         | 4         | Downstream processing  | 40 | 60 | 100        |
| 29 | Core        | Core Practical VI | 4         | 4         | Research methodology and Biostatistics and Environmental Biotechnology | 40 | 60 | 100        |
| 30 |             | Project           | 8         | 5         |  | 25 | 75 | 100        |
|    |             | <b>TOTAL</b>      | <b>30</b> | <b>25</b> |  |    |    | <b>600</b> |

Self study papers in I and III semester (optional) – Extra 2 credits for each subject

Note: The extra credit for internship and mini project will be included in the mark sheet and it will not be included in the total credits 90

| SUBJECT                   | PAPERS    | CREDIT           | TOTAL CREDIT | MARKS | TOTAL MARKS |
|---------------------------|-----------|------------------|--------------|-------|-------------|
| CORE                      | 10        | 7x5=35<br>3x4=12 | 47           | 100   | 1000        |
| CORE PRACTICAL            | 6         | 4                | 24           | 100   | 600         |
| ELECTIVE                  | 4         | 3                | 12           | 100   | 400         |
| PROJECT WITH DISSERTATION | 1         | 5                | 5            | 100   | 100         |
| COMPULSARY PAPER          | 1         | 2                | 2            | 100   | 100         |
| <b>TOTAL</b>              | <b>22</b> |                  | <b>90</b>    |       | <b>2200</b> |

### PROGRAMME EDUCATIONAL OBJECTIVES

**PEO 1:** To produce postgraduates with - advanced knowledge and understanding of biotechnology products and processes; higher order critical, analytical, problem solving and attitudinal skills (transferable) to meet expectations of biotech industry, academia, and research institutions or to take up entrepreneurial route.

**PEO 2:** To produce research oriented Biotechnology graduates who will be employable in academic/Industry sponsored research and also who will be pursuing higher

studies and biotechnologists to work in biotech sector including pharmacy, food, agriculture, biomedical Work as techno managers, administrator or entrepreneurs and Pursue doctoral research degrees to work in colleges, universities as professors or as scientists in research establishments

### **PROGRAM OUTCOMES:**

**PO 1:** Comprehensive understanding and knowledge on the principles and practices of biotechnology

**PO 2:** Skill to apply their gained knowledge in performing subject oriented experiments to solve biotechnological problems.

**PO 3:** Capability to identify, analyze and understand problems related to biotechnology and finding valid conclusions.

**PO 4:** Ability to design solutions for biotechnological problems

**PO 5:** Ability to recognize and evaluate Ethical/Social Implications of Biology

**PO 6:** An ability to function as individuals and as a member or leader in diverse technical teams (team work, practical, mini project and project) to solve problems related to biotechnology.

### **CELL AND MOLECULAR BIOLOGY**

| Semester | Subject Code | Category | Lecture       |    | Theory        |    | P | C |
|----------|--------------|----------|---------------|----|---------------|----|---|---|
| I        |              | Core     | 5hrs per week | 75 | 5hrs per week | 75 | 0 | 5 |

**COURSE OBJECTIVE:** In this course, students will

- Understand the basics, concepts in cell biology including characteristics, functions of cell types, cell organelles and identify cell division, cell motility, cell interaction, cell signaling and recognize fundamentals of molecular biology covering structures of nucleic acids, chromosomes and most elaborately the central dogma of molecular biology and study tools used to study cell biology and molecular biology.

**COURSE OUTCOMES:** Up on successful completion of course, students will be able to

| CO NUMBER | CO STATEMENT | KNOWLEDGE LEVEL ( K1-K6) |
|-----------|--------------|--------------------------|
|-----------|--------------|--------------------------|



Cytoskeleton structures and functions- microtubules, microfilaments and intermediate filaments, extracellular matrix, cell- extracellular matrix interaction, cell- cell interaction, Signaling molecules and their receptors, functions of cell surface receptors, pathways of intracellular transduction-cAMP pathway, CGMP, phospholipids and Ca, PI3-kinase/Akt and mTOR pathways, MAP kinase pathways, JAK/STAT and TGF- $\beta$ /Smad pathways, NF- $\kappa$ B Signaling, Hedgehog, Wnt, and Notch pathways.

**UNIT III      Nucleic acids and chromosomes      (12 hrs)**

Nucleic acids- DNA, RNA –structure and types, chromosome and its organization, types of chromosomes, DNA replication in prokaryotes and Eukaryotes, enzymes and accessory proteins involved in DNA replications, mutations and types, DNA repair, homologous recombination, site specific recombination and transposition – transposable elements and its regulation.

**UNIT IV      Gene expression and regulation      (15 hrs)**

RNA synthesis, post transcriptional modification, splicing, alternate splicing, RNA editing and RNA degradation, Genetic code, Wobble hypothesis, Translation, post translational modifications, RNA interference- siRNA, microRNA, Lac operon, his operon, trp operon, ara operon, Gene silencing by modifications of histones and DNA, alteration of gene expression by DNA sequence rearrangements in Salmonella and Trypanosoma.

**UNIT V      Tools used in Molecular Biology      (15 hrs)**

Gel retardation assay, Foot printing assay, nuclease protection foot printing, modification protection foot printing, fluctuation test, replica plating, Ames test, Complementation test.

Distribution of Marks: Theory 80% and Problems 20%

**TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars
- Models and charts

**TEXT BOOKS:**

| S.no. | Authors   | Title                      | Publishers   | Year of publication |
|-------|---|----------------------------|--|---------------------|
| 1.    | <a href="#">Harvey Lodish</a> , <a href="#">Arnold Berk</a> , <a href="#">Chris A. Kaiser</a> , <a href="#">Monty Krieger</a> | Molecular Cell biology     | W.H. Freeman and Company, New York, USA                            | 2004                |
| 2.    | <a href="#">P.S. Verma</a> & <a href="#">V K Agarwal</a>  | Cytology                   | S.Chand Publishing, New Delhi, India.                              | 2014                |
| 3.    | Geoffrey M Cooper, E. Robert Hausman,   | Cell: a molecular approach | Sinauer Associates Inc, Publishers Sunderland, Massachusetts U.S.A | 2013                |
| 4.    | James D. Watson   | Molecular Biology of Gene  | W. A. Benjamin publishers, USA.                                    | 2017                |

**REFERENCE BOOKS:**

| S.no. | Authors   | Title   | Publishers                     | Year of publication |
|-------|---|---|--------------------------------|---------------------|
| 1.    | Gerald Karp   | Cell and Molecular Biology: concepts and experiments: | John Wiley and sons, Inc., NJ. | 2015                |
| 2.    | <a href="#">Harvey Lodish</a> , <a href="#">Arnold Berk</a> , <a href="#">Chris A. Kaiser</a> , <a href="#">Monty Krieger</a> , <a href="#">Anthony Bretscher</a> , Hidde Ploegh; Angelika Amon; Kelsey C. Martin | Molecular cell biology                                | W.H. Freeman publishers & Co.  | 2016                |
| 3     | Micheal M Cox and David Nelson  | Lehninger Principles of biochemistry                  | W.H. Freeman and company       | 2008                |

## Web Sources

1. <https://www.khanacademy.org/science/high-school-biology/hs-cells/hs-introduction-to-cells/a/microscopy>
2. <https://www.ncbi.nlm.nih.gov/books/NBK9851/>
3. <https://www.youtube.com/watch?v=zf7tbymrv9o>
4. <https://www.youtube.com/watch?v=gZAw7pahzMM>
5. <https://www.youtube.com/watch?v=Ikq9AcBcohA>

**Syllabus Designer: Dr. D. Charumathi**

**Assistant Professor**

## BIOMOLECULAR INTERACTIONS

| Semester | Subject Code | Category | Lecture              |    | Theory           |    | P | C |
|----------|--------------|----------|----------------------|----|------------------|----|---|---|
| I        |              | Core     | 5 hrs<br>per<br>week | 75 | 5hrs per<br>week | 75 | 0 | 5 |

### COURSE OBJECTIVES:

- To understand the basics concepts and fundamentals of biochemistry with chemical bondings, bioenergetics, structure, function of biomolecules and its molecular interactions.

**COURSE OUTCOMES:** By the end of this course, students will able to:

| CO<br>NUMBER | CO STATEMENT   | KNOWLEDGE<br>LEVEL<br>( K1-K6) |
|--------------|--|--------------------------------|
| CO1          | Describe the basic structure of atoms, principles of biochemistry, stabilizing interactions and the principle of pH. | K2                             |
| CO2          | Identify and interpret the structure, functions and metabolism of carbohydrates                                      | K2                             |

|            |  |        |
|------------|--|--------|
|            | and lipids.  |        |
| <b>CO3</b> | To understand and analyze the structure of proteins, amino acids and its metabolism.         | K2, K4 |
| <b>CO4</b> | To know about and understand the functions of nucleic acids, fat and water soluble vitamins. | K2     |
| <b>CO5</b> | Understand and analyze various methods detecting biomolecular interactions                   | K2, K4 |

**Knowledge level:** K1- Remember; K2- Understand; K3- Apply; K4- Analyze; K5- Synthesize; K6- Evaluate

#### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | M          | M          |
| <b>CO2</b> | S          | M          | S          | S          | M          | S          |
| <b>CO3</b> | S          | M          | S          | M          | M          | S          |
| <b>CO4</b> | S          | M          | S          | M          | M          | M          |
| <b>CO5</b> | S          | M          | S          | M          | M          | S          |

S-strong; M- medium; L-low

### **UNIT – I: Basic concepts of organic chemistry**

**(12 hrs)**

Structure of atoms, molecules and chemical bonds. Covalent interactions: Covalent bond, Types of covalent bond – polar, non-polar, biological significance of covalent bond, covalent drugs. Non-covalent interactions - electrostatic, hydrogen bonding, Stabilizing interactions - Van der Waals, hydrophobic interactions, Significance of non-covalent interactions, non-covalent drugs.

pH, Henderson-Hasselbalch equation, Acid-base, Buffer, Role of buffers in biological system, phosphate buffer, bicarbonate buffer system, Reaction kinetics, Bioenergetics - Free energy, Entropy, Enthalpy, Laws of thermodynamics, High energy compounds, Colligative properties.

### **UNIT – II Carbohydrates and lipids**

**(18 hrs)**

Carbohydrate, classification, stereo isomeric forms, mutarotation, D & L sugars, structure and functions of biologically important carbohydrates viz. monosaccharide - glucose, fructose, mannose, galactose; Disaccharides – sucrose, lactose, maltose, cellobiose; structural and storage polysaccharides- starch, glycogen, inulin,

hemicelluloses, cellulose, lignin, chitin and peptidoglycans. , Metabolism-glycogenesis, glycogenolysis, glycolysis HMP shunt.

**Protein –carbohydrate interaction** – N –linked (Type -1), O – linked (Type II0, O-linked (Type III). Protein – lipid interaction, function of lipoprotein.

**Lipids:** Classification, Structure and functions of lipids. Storage lipids (fatty acids, triglycerides), membrane lipids, glycerophospholipids, sphingolipids and steroids. Metabolism-beta-oxidation of fatty acids, biosynthesis of phospholipids

### **UNIT – III: Proteins**

**(15 hrs)**

**Amino acid:** Classification, Essential and non-essential amino acids, amino acids building blocks of proteins, structure and properties of amino acids, peptide bonds. Protein- Classification and properties of protein, Structure- primary, secondary, Ramachandran plot, tertiary and quaternary structures. Transamination, Deamination and urea cycle.

**Protein – Protein interaction** – Protein interaction by Mass spectrometry, Protein affinity chromatography, affinity blotting, coimmunoprecipitation, Yeast Two – hybrid, Phage display.

### **UNIT – IV: Nucleic acids and Vitamins**

**(17hrs)**

**Nucleic acids:** Nomenclature, Classification, DNA, RNA, Structure, Chemistry and properties of purines and pyrimidines, Nucleosides and Nucleotides. Biosynthesis and degradation of purines and pyrimidines.

**Nucleic acid conjugate / protein – nucleic acid interaction** – Electrostatic forces, Dipolar forces, Entropic forces, Dispersion forces. Single stranded nucleic acid binding proteins, Non-sequence –specific nucleases, Specific interactions, Restriction endonucleases – EcoRI and EcoRV. Zinc finger motif, leucine zipper, helix-turn-helix motif.

**Vitamins:** Fat soluble (A, D, E and K) and water soluble (B & C)- Chemistry, Function, Dietary sources and deficiency manifestation. Metabolism of fat and water soluble vitamins.

### **UNIT – V :Methods for detection and analysis of biomolecule interactions (13hrs)**

**Spectroscopic methods** – Mass Spectroscopy, UV-Visible spectroscopy, Circular Dichroism, Maldi-Tof, Surface Plasmon Resonance, Isothermal Titration Calorimetry, Differential Scanning Calorimetry, Thermal Shift Assay, Equilibrium dialysis, Affinity capillary electrophoresis.



**TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars
- Models and charts

**TEXT BOOKS:**

| S.no. | Authors   | Title                        | Publishers                        | Year of publication |
|-------|-----------|------------------------------|-----------------------------------|---------------------|
| 1.    | J.L. Jain | Fundamentals of Biochemistry | S. Chand & Company, Limited       | 2016                |
| 2.    | A.C. Deb  | Fundamentals of Biochemistry | New Central Book Agency (P) Ltd   | 2017                |
| 3.    | G. Zubay  | Biochemistry                 | Macmillan Publishing Co, New York | 2010                |

**REFERENCE BOOKS:**

| S.no. | Authors                                  | Title                      | Publishers                   | Year of publication |
|-------|--|----------------------------|------------------------------|---------------------|
| 1.    | A.L. Lehninger., D.L Nelson and M.M. Cox | Principles of Biochemistry | Worth Publishers, New York   | 2016                |
| 2.    | L. Stryer                                | Biochemistry               | W.H. Freeman and Company     | 2018                |
| 3.    | D. Voet & J.G. Voet                      | Biochemistry               | Hoboken, N.J:J. Wiley & Sons | 2016                |

**WEB SOURCES:**

5. [https://proteopedia.org/wiki/index.php/Ramachandran\\_Plot](https://proteopedia.org/wiki/index.php/Ramachandran_Plot)
6. <http://www.biologydiscussion.com/metabolism/carbohydrates-metabolism/metabolism-of-carbohydrates-10-cycles-with-diagram/11242>
7. <https://nptel.ac.in/courses/112105129/pdf/RAC%20Lecture%204.pdf>

8. [http://ocw.ump.edu.my/pluginfile.php/9893/mod\\_resource/content/1/Nucleic%20Acid%20Metabolism.pdf](http://ocw.ump.edu.my/pluginfile.php/9893/mod_resource/content/1/Nucleic%20Acid%20Metabolism.pdf)
9. [http://elearning.vtu.ac.in/moodle2/pluginfile.php/101/mod\\_folder/content/0/10BT43/Biomolecular%20%20%20Interactions.pdf?forcedownload=1](http://elearning.vtu.ac.in/moodle2/pluginfile.php/101/mod_folder/content/0/10BT43/Biomolecular%20%20%20Interactions.pdf?forcedownload=1)

**Syllabus Designer: Dr. C. Suganthi**

**Assistant Professor**

### **MICROBIOLOGY**

| <b>Semester</b> | <b>Subject Code</b> | <b>Category</b> | <b>Lecture</b> |    | <b>Theory</b>  |    | <b>P</b> | <b>C</b> |
|-----------------|---------------------|-----------------|----------------|----|----------------|----|----------|----------|
| I               |                     | Core            | 5 hrs per week | 75 | 5 hrs per week | 75 | 0        | 5        |

#### **COURSE OBJECTIVES:**

- This course helps the student to understand the microbial world, their growth nature, the pathogenicity and the exploitation of the microbes for agricultural and industrial applications.

#### **COURSE OUTCOMES:**

After completion of the course students will be able to

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge level<br/>K1 – K4</b> |
|------------------|--|------------------------------------|
| <b>CO1</b>       | Understand the structure, classification of microbes and microscopy.                   | K2                                 |
| <b>CO2</b>       | Recognize and selection of media and sterilization method                              | K2                                 |
| <b>CO3</b>       | Deduce microbial interactions with the host  | K4                                 |
| <b>CO4</b>       | Assess and evaluate the microorganisms causing diseases and test for its pathogenicity | K5                                 |
| <b>CO5</b>       | Diagnose the role of microbes in food industry   | K5                                 |

**Knowledge level:** K1- Remember; K2- Understand; K3- Apply; K4- Analyze; K5- Synthesize; K6- Evaluate

**MAPPING WITH PROGRAM OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | M          | M          |
| <b>CO2</b> | M          | M          | S          | M          | S          | S          |
| <b>CO3</b> | S          | M          | S          | M          | M          | S          |
| <b>CO4</b> | M          | M          | S          | S          | S          | S          |
| <b>CO5</b> | S          | M          | S          | M          | M          | S          |

S-strong; M- medium; L-low

**UNIT 1: General Classification Of Microbes And Microscopy: (15hrs)**

Principles & classification of microbes – binomial nomenclature Whittaker five kingdom Microscopic techniques: Visualization of cells and subcellular components by light microscopy, resolving powers of different microscopes, microscopy of living cells, scanning and transmission microscopes, different fixation and staining techniques for EM, freeze-etch and freeze-fracture methods for EM, image processing methods in microscopy. Ultra structure – functions of microbial cellular compounds (bacteria, algae, viruses, fungi, protozoa).

**UNIT II: Microbial Physiology, Media And Sterilization: (10hrs)**

Microbial media – types. Sterilization and disinfection - Physical and chemical methods of sterilization – stain and staining methods – principles of staining - simple, differential, capsule, nuclear and spore staining methods. methods of obtaining Pure cultures - methods for microbial identification. Microbial growth – Phases of growth curve, Factors influencing the growth of microbes-classification (Temperature, pH, Nutrition) and nutritional types of microorganisms.

**UNIT III: Host Parasite Interaction: (10hrs)**

Recognition and entry processes of different pathogens like bacteria, viruses into animal and plant host cells, alteration of host cell behavior by pathogens, virus-induced cell transformation, pathogen-induced diseases in animals and plants, cell-cell fusion in both normal and abnormal cells. Immune response during bacterial (tuberculosis), parasitic (malaria) and viral (HIV) infections. Responses of plants to biotic (pathogen) stresses.

**UNIT IV: Medical Microbiology: (10hrs)**

Pathogenesis, lab diagnosis, prevention and control of important microbial diseases, Pathogenic bacteria diseases (E.coli, Tuberculosis, Leprosy, Typhoid) - Fungal diseases (Candida sp, Aspergillus, cryptococcus) Viral Diseases (HIV, Rabies, Hepatitis and Polio Virus) and Protozoan diseases (Plasmodium, Trypanosoma).

**UNIT V: Food Microbiology:****(15hrs)**

Microorganisms in Foods and methods for detection: Fresh meat, Processed meat and poultry, Culture, Microscopic, and Sampling Method for detecting microbes, Physical, Chemical methods.

Beneficial Uses of Microorganisms in Food Intestinal Beneficial Bacteria-Concept of Prebiotics and Probiotics, Genetically modified foods. Biosensors in food

Food Preservation & Principles of Quality Control: Chemicals antibiotics, Radiation, Low and high temperature, High-Pressure Processing Pulsed Electric Fields. Aseptic Packaging, Microbiological quality standards of food, FDA, HACCP, ISI.

**TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars
- Models and charts

**TEXT BOOKS:**

| S.no | Authors                                       | Title                      | Publishers                  | Year of publication |
|------|---|----------------------------|-----------------------------|---------------------|
| 1    | R. Anandanarayanan and C.K.J. Paniker.        | Text book of Microbiology  | Universities press          | 2017                |
| 2    | Micheal J. Pelczar, E.C.S Chan, Noel R. Krieg | Microbiology               | Tata-McGraw Hill            | 2008                |
| 3    | W.C. Frazier and D.C. Westhoft                | Food microbiology          | tata Mcgra Hill publication | 2013                |
| 4    | Richard V. Goering                            | Mim's Medical Microbiology | Elsievier                   | 2012                |
| 5    | Prescott, Harley and Klein                    | Microbiology               | McGraw Hill Education       | 2015                |

**REFERENCE BOOKS;**

| Sno | Authors            | Title        | Publishers         | Year of publication |
|-----|--------------------|--------------|--------------------|---------------------|
| 1   | Jacquelyn G. Black | Microbiology | Wiley publications | 2014                |

|   |                 |   |                    |      |
|---|-----------------|---|--------------------|------|
| 2 | Paul A. Ketchum | Microbiology – concepts and application | Wiley publications | 1988 |
|---|-----------------|---|--------------------|------|

**WEB SOURCES:**

- [http://www.microrao.com/micronotes/pg/culture\\_media.pdf](http://www.microrao.com/micronotes/pg/culture_media.pdf)
- <http://library.open.oregonstate.edu/microbiology/chapter/introduction-to-microbiology/>
- [http://microbiology.ukzn.ac.za/Libraries/MICR304/CULTURE\\_PROCEDURES.sflb.ashx](http://microbiology.ukzn.ac.za/Libraries/MICR304/CULTURE_PROCEDURES.sflb.ashx)
- <https://www.docsity.com/en/host-parasite-interactions-microbiology-lecture-slides/232518/>
- <https://www.studocu.com/en/document/university-of-southern-queensland/medical-microbiology-and-immunology-1/lecture-notes/lectures-notes-1-to-23/319412/view>
- <http://www.teilar.gr/dbData/ProfAnn/profann-f2bc2d4d.pdf>

**Syllabus Designer: Mrs. S. Akhila**

**Assistant Professor**

**BIOINSTRUMENTATION**

| Semester | Subject Code | Category             | Lecture | Theory | P | C |
|----------|--------------|----------------------|---------|--------|---|---|
| I        |              | Self study(optional) | 0       | 0      | 0 | 2 |

**Course Objective:**

- To provide fundamental theoretical knowledge to the students with an adequate number of analytical tools about bioinstruments, biomethods, its principle and operation methods.

**Course outcomes:** By the end of this course, students will able to:

| CO NUMBER | CO STATEMENT  | KNOWLEDGE LEVEL ( K1-K4) |
|-----------|---|--------------------------|
| CO1.      | To understand the concepts of microscopy and centrifugation | K2                       |
| CO2.      | Understand the principles and types of chromatography       | K2                       |
| CO3.      | To learn, apply and analyze the                             | K4                       |

|      |   |        |
|------|---|--------|
|      | samples using colorimetry and spectrophotometry                                       |        |
| CO4. | To analyze and interpret the data obtained using NMR                                  | K3     |
| CO5. | To evaluate genetic problems by various eletrophoretic techniques and DNA technology. | K1, K3 |

**Knowledge level:** K1- Remember; K2- Understand; K3- Apply; K4- Analyze; K5- Synthesize; K6- Evaluate

#### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | M          | M          | M          | M          |
| <b>CO2</b> | S          | M          | M          | M          | M          | M          |
| <b>CO3</b> | M          | S          | S          | M          | M          | S          |
| <b>CO4</b> | M          | M          | S          | M          | M          | S          |
| <b>CO5</b> | M          | S          | S          | M          | S          | S          |

S-strong; M- medium; L-low

#### **UNIT- I**

##### **Microscopy**

**(8hrs)**

Basic Principles, Instrumentation and Applications of Phase contrast, Flourescence, Scanning Electron Microscope (SEM), and Transmission Electron Microscope (TEM).Centrifugation techniques: Microfuges, High speed centrifuges, Fractionation process, Ultracentrifuges, Density gradient centrifugation, Differential centrifugation.

#### **UNIT-II**

##### **Chromatography**

**(9hrs)**

Chromatography: Basic principle, source, detectors and applications of Paper Chromatography, Thin Layer Chromatography, Gas Chromatography, Column

chromatography, Gel filtration chromatography, High-Pressure Liquid Chromatography, Ion Exchange Chromatography, Size-Exclusion Chromatography.

### **UNIT- III**

#### **Colorimetry and Spectrophotometry**

**(10hrs)**

Spectral Methods Of Analysis: Beer-Lambert Law, Colorimeters: UV-Visible Spectrophotometers, Single And Double Beam Instruments, Sources And Detectors, IR Spectrophotometers: Type, Attenuated Total Reflectance Flame Photometers, Atomic Absorption Spectrophotometers: Sources And Detectors, FTIR Spectrophotometers, Flame Emission Photometers, Fluorescence Spectrophotometer, Mass Spectrometers, CD.

### **UNIT – IV**

#### **Nuclear Magnetic Resonance**

**(9hrs)**

NMR: Basic Principles, NMR Spectrometer and Applications. Electron Spin Resonance Spectroscopy: Basic Principles, Instrumentation and Applications, XRD: Basic Principles, Instrumentation and Applications, ESR: Basic Principles, Instrumentation and Applications.

### **UNIT – V**

#### **Electrophoretic techniques and DNA technology**

**(9hrs)**

Introduction to electrophoresis, SDS-PAGE, Native –PAGE, pulse field gel electrophoresis, immuno-electrophoresis, isoelectric focusing, Agarose gel electrophoresis, Western Blotting, Southern Blotting.

Isolation and purification of RNA , DNA (genomic and plasmid) and proteins, analysis of RNA , DNA and proteins by one and two dimensional gel electrophoresis, protein sequencing methods, strategies for genome sequencing; RFLP, RAPD and AFLP techniques.

#### **TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars
- Models and charts

#### **TEXT BOOKS:**

| S.No. | Authors                                  | Title   | Publishers                               | Year of publication |
|-------|--|---|--|---------------------|
| 1.    | Wilson.K.,<br>Walker.J.<br>E.J., Wood.K. | Principles & techniques of practical biochemistry | Cambridge University Press               | 2010                |
| 2.    | Veerakumari.L                            | Bioinstrumentation                                | MJP Publishers, 1 <sup>st</sup> edition. | 2011                |

#### REFERENCE BOOKS:

| S.no. | Authors         | Title                                 | Publishers                  | Year of publication |
|-------|-----------------|---------------------------------------|-----------------------------|---------------------|
| 1.    | John.G Webster  | Bioinstrumentation                    | John Wiley & Sons, New York | 2009                |
| 2.    | Robert D. Braun | Introduction to Instrumental Analysis | McGraw Hill, Singapore      | 2010                |

#### WEB SOURCES:

1. <https://www.hccfl.edu/media/572066/microscopy.pdf>
2. <http://www.biologydiscussion.com/biochemistry/chromatography-techniques/top-12-types-of-chromatographic-techniques-biochemistry/12730>
3. <https://www.labcompare.com/Spectroscopy/105-Spectrophotometers/>
4. <https://www.oregonstatehospital.net/d/otherfiles/Electron%20Spin%20Resonance%20Spectroscopy.pdf>
5. <https://nptel.ac.in/courses/102103013/17>

**Syllabus Designer: Dr. C. Suganthi**

**Assistant Professor**

#### EVOLUTION AND DIVERSITY OF LIFE (SELF STUDY)

| Semester | Subject Code | Category | Lecture        |    | Theory         |    | P | C |
|----------|--------------|----------|----------------|----|----------------|----|---|---|
| I        |              | Elective | 3 hrs per week | 45 | 3 hrs per week | 45 | 0 | 3 |



**COURSE OBJECTIVES:**

- The course is presented from an evolutionary perspective which focuses on the diversity of life and the similarities found among all living things and provide the tools to critically analyze biological data and intelligently relate these data to issues in our society such as extinction, global warming etc.

**COURSE OUTCOME:**

| CO Number | CO Statement   | Knowledge level K1 – K4 |
|-----------|--|-------------------------|
| CO1       | Understand the theories of evolution and behavior                          | K2                      |
| CO2       | Analyse the time scale and molecular evolution                             | K4                      |
| CO3       | Evaluate brain behaviour and evolution                                     | K4                      |
| CO4       | Analyse the classification of life forms                                   | K4                      |
| CO5       | Demonstrate about the habitat types in India and importance of agriculture | K3                      |

**Knowledge level:** K1- Remember; K2- Understand; K3- Apply; K4- Analyze; K5- Synthesize; K6- Evaluate

**MAPPING WITH PROGRAM OUTCOMES:**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | M   | M   | M   |
| CO2 | M   | M   | S   | M   | M   | S   |
| CO3 | M   | M   | S   | M   | S   | S   |
| CO4 | M   | M   | S   | M   | M   | S   |
| CO5 | M   | S   | S   | S   | S   | S   |

S-strong; M- medium; L-low

**UNIT I: Evolution And Behaviour :****(10 hrs)**

Emergence of evolutionary thoughts Lamarck; Darwin–concepts of variation, adaptation, struggle, fitness and natural selection; Mendelism; Spontaneity of mutations; The evolutionary synthesis

Concept of Oparin and Haldane; Experiment of Miller (1953); The first cell; Evolution of prokaryotes; Origin of eukaryotic cells; Evolution of unicellular eukaryotes

**UNIT II: Paleontology And Evolutionary History: (15hrs)**

The evolutionary time scale; Eras, periods and epoch; Major events in the evolutionary time scale; Origins of unicellular and multi cellular organisms; Major groups of plants and animals; Stages in primate evolution including Homo.

Molecular Evolution: Concepts of neutral evolution, molecular divergence and molecular clocks; Molecular tools in phylogeny, classification and identification; origin of new genes and proteins; Gene duplication and divergence.

**UNIT III: Brain, Behavior And Evolution: (10hrs)**

Approaches and methods in study of behavior; Proximate and ultimate causation; Altruism and evolution-Group selection, Kin selection, Reciprocal altruism; Neural basis

of learning, memory, cognition, sleep and arousal; Biological clocks; Development of behavior; Social communication; Social dominance; Use of space and territoriality; Mating systems, Parental investment and Reproductive success; Parental care; Aggressive behavior; Habitat selection and optimality in foraging; Migration, orientation and navigation; Domestication and behavioral changes.

**UNIT IV: Diversity of Life Forms: (10hrs)**

Principles & methods of taxonomy: Concepts of species and hierarchical taxa, biological nomenclature, classical & quantitative methods of taxonomy of plants, animals and microorganisms.

Outline classification of plants, animals & microorganisms: Important criteria used for classification in each taxon. Classification of plants, animals and microorganisms. Evolutionary relationships among taxa.

**UNIT V: Natural History of Indian Subcontinent: (10hrs)**

Major habitat types of the subcontinent, geographic origins and migrations of species. Common Indian mammals, birds. Seasonality and phenology of the subcontinent.

Organisms of health & agricultural importance: Common parasites and pathogens of humans, domestic animals and crops. Organisms of conservation concern: Rare, endangered species. Conservation strategies.

**TEXT BOOKS:**

| S.no | Authors         | Title                           | Publishers                         | Year of publication |
|------|-----------------|---------------------------------|------------------------------------|---------------------|
| 1    | Robert Brooker  | Evolution Diversity and Ecology | McGraw Hill Companies Incorporated | 2010                |
| 2    | Edward O.Wilson | The Diversity of life           | W.W Norton and Company             | 2010                |

**REFERENCE BOOKS:**

| S.no | Authors       | Title                           | Publisher                                 | Year of publication |
|------|---------------|---------------------------------|---|---------------------|
| 1    | Mayr Ernst    | Evolution and diversity of life | Library of congress – in-publication data | 2015                |
| 2    | Eli C.Minkoff | Evolutionary biology            | Addison Wesley Publishing Company         | 2010                |

**WEB SOURCES:**

- <https://www.ugc.ac.in/oldpdf/modelcurriculum/Chapter4.pdf>
- <https://www.biodiversitylibrary.org>
- <https://www.studocu.com/en/document/university-of-calgary/primate-behaviour/lecture-notes/lecture-notes-lecture-9-evolution-and-natural-selection/430446/view>
- [https://www.academia.edu/10084149/Paleontology\\_Lecture\\_Notes](https://www.academia.edu/10084149/Paleontology_Lecture_Notes)
- <https://www.studocu.com/en/document/macewan-university/brain-and-behaviour/lecture-notes/lecture-notes-brain-and-behaviour-chapter-1-7-9-11/723069/view>
- <https://courses.lumenlearning.com/wm-biology2/chapter/the-diversity-of-life/>

**Syllabus Designer: Mrs. S. Akhila, Assistant Professor**

**GENETIC ENGINEERING**

| Semester | Subject Code | Category | Lecture        |    | Theory         |    | P | C |
|----------|--------------|----------|----------------|----|----------------|----|---|---|
| II       |              | Core     | 4 hrs per week | 60 | 4 hrs per week | 60 | 0 | 5 |

**COURSE OBJECTIVE:**

- To gain knowledge about gene cloning strategies and elucidate the cloning techniques in improvement of living organism.

**COURSE OUTCOMES:**

On the successful completion of the course, students will be able to

| CO NUMBER  | CO STATEMENT   | KNOWLEDGE LEVEL (K1-K4) |
|------------|--|-------------------------|
| <b>CO1</b> | Identify the role of enzymes in genetic engineering                  | K2                      |
| <b>CO2</b> | Understand the characteristics of vectors and gene transfer methods. | K2                      |
| <b>CO3</b> | Analyze different molecular techniques                               | K4                      |
| <b>CO4</b> | Assess the effectiveness of techniques in appropriate field.         | K4                      |
| <b>CO5</b> | Apply gene manipulation methods in enhancement of living organism    | K3                      |

**Knowledge level:** K1- Remember; K2- Understand; K3- Apply; K4- Analyze; K5- Synthesize; K6- Evaluate

**MAPPING WITH PROGRAM OUTCOMES:**

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | S   | M   | M   | M   |
| <b>CO2</b> | S   | M   | S   | M   | M   | M   |
| <b>CO3</b> | M   | M   | S   | S   | M   | S   |
| <b>CO4</b> | M   | M   | S   | S   | S   | S   |
| <b>CO5</b> | M   | S   | M   | S   | S   | S   |

S-strong; M- medium; L-low

**Unit-1: Enzymes in Genetic Engineering****(14hrs)**

Overview of gene cloning. Enzymes for in vitro manipulation – Endonuclease, polymerases, topoisomerases, modifying enzymes, methylase, RNase, Ligases- Adapters, Linkers, Homopolymer Tailing.

**Unit-2: Cloning vectors****(15hrs)**

Cloning vehicles: Plasmids – Host range, Copy number control, Compatibility (pBR322, pUC) Bacteriophages- $\lambda$  phage, M13, Cosmids, Phasmids, Yeast vectors-YAC, BAC, Ti Plasmid, Plant viral (CaMV, TMV) and Animal viral (SV 40, Retrovirus) vectors, Specialized vectors- Expression vector, Shuttle vectors.

Gene transfer techniques: biological methods, chemical methods, physical or mechanical methods, *Agrobacterium*- mediated gene transfer in plants.

**Unit-3: Genetic engineering tools****(15hrs)**

DNA sequencing – Importance, Chemical & Enzymatic methods, Pyro sequencing, Automated sequence. PCR -Principle, application and types of PCR. RFLP, RAPD and AFLP techniques. Blotting techniques: southern, northern and western. Genomic Library and cDNA library -Construction and Screening.

**Unit-4: Mutagenesis****(15hrs)**

Site directed mutagenesis, RACE, Kuntels method of mutagenesis. Gene Silencing, RNA interference, antisense therapy, Gene Knockout. DNA foot printing, finger printing, DNA microarray and its application.

**Unit-5: Gene therapy****(16hrs)**

Gene therapy: Introduction and Methods, Gene therapy in the treatment of diseases (ADA, Cystic Fibrosis), Challenges and future of gene therapy.

Applications of recombinant DNA technology for humans-insulin production, vaccine and Tissue Plasminogen Activator, recombinant hormones. Metabolite engineering, imparting new agronomic traits to plants – resistance to abiotic and biotic stress, improving quality and quantity. Animal pharming. Bioethics: laws, possible dangers to society or nature.

**TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars
- Models and charts

**TEXT BOOKS:**

| S.no | Authors                       | Title  | Publishers                        | Year of publication |
|------|-------------------------------|--|-----------------------------------|---------------------|
| 1.   | Brown T.A                     | Introduction to gene cloning                 | Stanley Thomas Pub Ltd            | 2016                |
| 2.   | Primrose S.B. and Twyman R.M. | Principles of gene manipulation and Genomics | Blackwell Scientific Publications | 2018                |

**REFERENCE:**

| S.no | Authors             | Title                   | Publishers                               | Year of publication |
|------|---------------------|-------------------------|--|---------------------|
| 1    | Benjamin Lewin      | Genes IX                | Oxford University & Cell Press           | 2010                |
| 2    | Glick and Pasternak | Molecular biotechnology | Panama publishing corporation, New Delhi | 2010                |
| 3    | Ernst.L.Winnacker   | From gene to clones     | Panama publishing corporation, New Delhi | 2013                |

**WEB SOURCES:**

1. <https://www.google.com/urwww.youtube.com%2Fwatch%2Furlwww.youtube.com%2Furlrecombinant-dna-technology-tools-and-techniques&usg>
2. <https://www.google.com/urwww.youtube.com%2Fwatch%2Furlwww.youtube.com%2Furlrecombinant-dna-technology-tools-and-techniques&usg>
3. <https://www.google.com/urwww.youtube.com%2Fwatch%2Furlwww.youtube.com%2Furlrecombinant-dna-technology-tools-and-techniques&usg>
4. [www.britannica.com%2Fscience%2Frecombinant-DNA-technology%2FIn-vitro-mutagenesis&usg](https://www.google.com/urwww.youtube.com%2Fwatch%2Furlwww.youtube.com%2Furlrecombinant-dna-technology-tools-and-techniques&usg)
5. [https://www.google.com/url?What-is-Gene-Therapy.aspx&usg](https://www.google.com/urwww.youtube.com%2Fwatch%2Furlwww.youtube.com%2Furlrecombinant-dna-technology-tools-and-techniques&usg)

**Syllabus Designer: Mrs. M. Malathi , Assistant Professor**

## ENZYME TECHNOLOGY

| Semester | Subject Code | Category | Lecture        |    | Theory         |    | P | C |
|----------|--------------|----------|----------------|----|----------------|----|---|---|
| II       |              | Core     | 4 hrs per week | 60 | 4 hrs per week | 60 | 0 | 4 |

### COURSE OBJECTIVES:

- The objective of the course is to endow with a deeper approaching into the fundamentals of enzyme structure, functions, kinetics of immobilized enzyme, applications and future prospective of enzymes.

**COURSE OUTCOMES:** By the end of this course, students will able to:

| CO NUMBER | CO STATEMENT   | KNOWLEDGE LEVEL ( K1-K4) |
|-----------|--|--------------------------|
| CO1       | To understand the basic concepts of enzyme structure and its functions                                       | K2                       |
| CO2       | Understand the enzyme kinetic reactions and enzyme inhibition studies  | K2                       |
| CO3       | To learn, analyze and apply various immobilization and purification techniques.                              | K3. K4                   |
| CO4       | To learn and understand the various methods of enzyme catalysis  | K2                       |
| CO5       | Apply and identify the uses of enzyme technology with current applications in a diverse range of industries. | K1, K3                   |

**Knowledge level:** K1- Remember; K2- Understand; K3- Apply; K4- Analyze; K5- Synthesize; K6- Evaluate

### MAPPING WITH PROGRAMME OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | M   | M   | M   |
| CO2 | S   | M   | S   | M   | M   | S   |
| CO3 | S   | S   | M   | M   | M   | S   |
| CO4 | M   | M   | S   | M   | M   | S   |
| CO5 | M   | S   | S   | S   | M   | S   |

S-strong; M- medium; L-low

## **UNIT - I**

### **Introduction to enzymes**

**(10hrs)**

Nomenclature and classification of enzymes, enzyme units, katal and IU, enzyme activity, chemical nature of enzymes, enzyme structure and properties (specificity, co-factors, Co-enzyme, apoenzyme, isoenzyme and prosthetic groups), Mechanism of action of enzymes and free energy changes.

## **UNIT - II**

### **Enzyme Kinetics**

**(12hrs)**

Henri-Michaelis-Menten equation and Briggs Haldane hypothesis, Lineweaver-Burk plot. Enzyme inhibition: reversible (Competitive, Non-competitive and Un-competitive) and irreversible inhibition. Substrate and product inhibition. Negative feedback inhibition, allosterism/or allosteric enzyme.

## **UNIT - III**

### **Enzyme immobilization, purification and characterization**

**(13hrs)**

Physical and Chemical Techniques for Enzyme Immobilization – Adsorption, Matrix Entrapment, Encapsulation, Cross-Linking, Covalent Binding and Suitable Examples – Advantages and Disadvantages of immobilized enzymes.

Production and purification of crude enzyme extracts from plant, animal and microbial sources. Methods of enzyme characterization: Effect of pH, temperature, substrate, detergents, metal ions.

## **UNIT – IV**

### **Enzyme Catalysis**

**(13hrs)**

Enzyme catalysis: General principles, Lock and key model, Induced fit model, Mechanism of enzyme catalysis: acid-base catalysis, covalent catalysis, metal ion catalysis, proximity and orientation, preferential binding of the transition state, mechanism of serine protease - chymotrypsin, Lysozyme, carboxypeptidase A and Ribonuclease.

## **UNIT – V**

### **Applications and future trends of enzymes**

**(12hrs)**



Biocatalysis - Advantages and disadvantages. Applications of enzymes in food, pharmaceuticals, medicine and diagnostics, synthesis of antibiotics, production of therapeutics and fine chemicals using biocatalysis.

**TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars
- Models and charts

**TEXT BOOKS:**

| S.no. | Authors  | Title                                       | Publishers | Year of publication |
|-------|--|---|------------|---------------------|
| 1.    | A. Pandey.,<br>C.Webb., C.R.<br>Soccol and<br>C.Larroche | Enzyme<br>Technology                        | Springer   | 2006                |
| 2.    | K.Buchholz., V.<br>Kasche and U.<br>Bornscheuer          | Biocatalysts<br>and<br>Enzyme<br>Technology | WILEY-VCH  | 2005                |

**REFERENCE BOOKS:**

| S.no. | Authors                                 | Title   | Publishers             | Year of publication |
|-------|---|---|------------------------|---------------------|
| 1.    | Blanch, H.W.,<br>Clark, D.S.            | Biochemical<br>Engineering,                                       | Marcel<br>Dekker       | 2015                |
| 2.    | Wiseman, Alan.                          | Hand Book Of<br>Enzyme<br>Biotechnology,<br>3 <sup>rd</sup> Edn., | Ellis<br>Harwood       | 2006                |
| 3.    | Nicoles C Price<br>and Lewis<br>Stevens | Fundamentals<br>of Enzymology                                     | Oxford Univ.<br>Press. | 2005                |

**WEB SOURCES:**

1. <http://www.biologydiscussion.com/enzymes/enzymes-properties-and-mechanism-of-enzyme-action/6145>
2. <http://www.biology-pages.info/E/EnzymeKinetics.html>
3. <https://www.easybiologyclass.com/enzyme-cell-immobilization-techniques/>
4. <https://nptel.ac.in/courses/103103026/36>
5. <http://cyber.scihub.tw/MTAuMzEwOS8wNzM4ODU1MS4yMDE0Ljk1MDU1MA==/10.3109%4007388551.2014.950550.pdf>

**Syllabus Designer: Dr. D.Charumathi**

**Assistant Professor**

**IMMUNOLOGY & IMMUNOTECHNOLOGY**

| Semester | Subject Code | Category | Lecture        |    | Theory        |    | P | C |
|----------|--------------|----------|----------------|----|---------------|----|---|---|
| II       |              | Core     | 5 hrs per week | 75 | 5hrs per week | 75 | 0 | 5 |

**COURSE OBJECTIVE:**

- To understand the structural features and components of the immune system as well as their functions to provide applied aspects of immunology such as diagnosis of immune related disorders along with immunotherapy.

**COURSE OUTCOMES:**

On the successful completion of the course, students will be able to

| COS        | CO STATEMENT   | KNOWLEDGE LEVEL (K1-K6) |
|------------|--|-------------------------|
| <b>CO1</b> | Understand the cells and organs of immune system   | K2                      |
| <b>CO2</b> | Understand the nature of antigens and Classify immunoglobulin on their structure and function. | K2                      |
| <b>CO3</b> | Analyze the generation of B and T cell responses   | K4                      |
| <b>CO4</b> | Manipulate immune system to fight against infections.  | K4                      |
| <b>CO5</b> | Testing antigen antibody   | K3                      |

|  |   |  |
|--|---|--|
|  | interaction and antibody engineering for interpretation of immune diseases. |  |
|--|---|--|

**Knowledge level:** K1- Remember; K2- Understand; K3- Apply; K4- Analyze; K5- Synthesize; K6- Evaluate

#### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | S          | M          |
| <b>CO2</b> | S          | M          | S          | M          | M          | M          |
| <b>CO3</b> | M          | M          | S          | M          | M          | S          |
| <b>CO4</b> | M          | M          | S          | S          | S          | S          |
| <b>CO5</b> | M          | M          | S          | S          | S          | S          |

S-strong; M- medium; L-low

#### **Unit-1: Cells and organs of immune system:**

**(14 hrs)**

Immunity –innate immunity, barriers involved in innate immunity. Acquired immunity-humoral and cell mediated immunity. Cells and molecules involved in innate and adaptive immunity-B cells, T cells, NK cells, Dendritic cells, Monocytes, Macrophages, neutrophils, eosinophils, basophils and mast cells. Humoral and cell-mediated immune responses, primary and secondary immune modulation. Organs of the immune system- primary and secondary lymphoid organs; Lymphatic system; Mucosal, Gut and Cutaneous associated Lymphoid tissue (MALT, GALT & CALT);

#### **Unit-2: Antigens and immunoglobulins:**

**(15hrs)**

**Antigens:** Properties of antigen, Immunogens, Haptens, Role of adjuvants, antigenicity and immunogenicity. Epitopes- B and T cell epitopes.

**Immunoglobulins-** Basic structure, classes and subclasses of antibody molecules. Immunoglobulin mediated effector functions- Opsonization, complement activation, ADCC, Cytokines and their role in immune recognition.

#### **Unit-3: Generation of B-cell and T –cell responses:**

**(14hrs)**

MHC molecules-organization, MHC class I , II and III structure and genes. Structure ,types and biology of complement system.

Antigen processing and presentation-Endogenous antigen(Cytosolic pathway), Exogenous antigen(Endocytic pathway). T cell receptors-Structure,

maturation, Activation and differentiation. B cells receptors-Structure, Activation and differentiation.

#### **Unit-4: Clinical Immunology**

**(17hrs)**

Immune response during bacterial (tuberculosis), parasitic (malaria) and viral (HIV) infections, Hypersensitivity – Type I-IV; Autoimmunity-Types of autoimmune diseases, Treatment of autoimmune diseases. Immunodeficiencies- congenital and acquired immunodeficiencies. Transplantation – Immunological basis of graft rejection; Clinical transplantation and immunosuppressive therapy.

**Tumor immunology:** Tumor antigens; Immune response to tumors and tumor evasion of the immune system and Cancer immunotherapy. **Vaccines:** Active and passive immunization; recombinant vaccines.

#### **Unit-5: Immunological techniques:**

**(15hrs)**

**Antigen-antibody interactions:** Salient features of antigen- antibody interaction, Precipitation reactions-precipitation reaction in fluids, in gel: Radial immunodiffusion, Double immunodiffusion and immunoelectrophoresis. Agglutination reactions-haemagglutination, bacterial and passive agglutination. ABO blood grouping. Advanced immunological techniques- RIA, ELISA, Western blotting, immunoprecipitation, , immunofluorescence microscopy, flow cytometry.

**Antibody engineering-** Production of Chimeric and hybrid monoclonal antibodies & its clinical uses.

#### **TEACHING METHODOLOGY:**

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars Models and charts

#### **TEXT BOOKS:**

| <b>S.no</b> | <b>Authors</b>                      | <b>Title</b>             | <b>Publishers</b>                | <b>Year of publication</b> |
|-------------|-------------------------------------|--------------------------|----------------------------------|----------------------------|
| 2.          | Janis Kuby, Thomas J Kindt, Goldsby | Immunology               | W.H. Freeman and company         | 2018                       |
| 3.          | Ivan Roitt                          | Essentials of Immunology | Blackwell scientific publication | 2017                       |

**REFERENCES:**

| S.no | Authors                                       | Title  | Publishers           | Year of publication |
|------|---|--|----------------------|---------------------|
| 2.   | Primrose S.B.,<br>Twyman R.H.,<br>and Old R.W | Principles of<br>Gene<br>Manipulation                      | Blackwell<br>Science | 2015                |
| 3.   | Paul W.E                                      | Fundamentals<br>of<br>immunology                           | Raven press          | 2019                |
| 4.   | Glick B.R. and<br>Pasternak J.J               | Principles and<br>applications<br>of<br>recombinant<br>DNA | ASM Press            | 2015                |

**WEB SOURCES:**

1. <https://www.youtube.com/redirect.patreon.com>
2. <https://www.youtube.com/redirectFunacademy.com>
3. <https://www.google.com> / [www.ncbi.nlm.nih](http://www.ncbi.nlm.nih).
4. <https://www.google.com/uwww.biologydiscussion.commonoclonal-antibodies-production-advantages-and-limitations>
5. <https://www.google.com/what-is-immunity-definition-types.html&usg>

**Syllabus Designer: Mrs. M. Malathi,                      istant professor**

**PLANT AND ANIMAL PHYSIOLOGY**

| Semester | Subject Code | Category | Lecture              |    | Theory            |    | P | C |
|----------|--------------|----------|----------------------|----|-------------------|----|---|---|
| II       |              | Elective | 3 hrs<br>per<br>week | 45 | 3 hrs per<br>week | 45 | 0 | 3 |

**COURSE OBJECTIVE:**

- After completing the course the students should be able to understand the Structure and function of animal physiology and organ systems are considered in the following context; circulation, respiration, nervous

systems, endocrine systems, excretion and developmental biology. Concerning plants there is special emphasis on plant physiology.

### **COURSE OUTCOMES:**

Upon successful completion of the course the students will be able to

| <b>CO NUMBER</b> | <b>CO STATEMENT</b>  | <b>KNOWLEDGE LEVEL ( K2-K5)</b> |
|------------------|--|---------------------------------|
| <b>CO1</b>       | Understand the process of photosynthesis, respiration and transpiration. | K2                              |
| <b>CO2</b>       | Demonstrate the synthesis of plant hormones and secondary metabolites.   | K3                              |
| <b>CO3</b>       | Analyze Cardiac cycle and the electrocardiogram (ECG).                   | K4                              |
| <b>CO4</b>       | Differentiate animal reproduction in different species respectively.     | K4                              |
| <b>CO5</b>       | Compare renal physiology and endocrinology and its regulations.          | K5                              |

**Knowledge level:** K1- Remember; K2- Understand; K3- Apply; K4- Analyze; K5- Synthesize; K6- Evaluate

### **MAPPING WITH PROGRAM OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | M          | M          |
| <b>CO2</b> | M          | S          | S          | M          | S          | S          |
| <b>CO3</b> | M          | M          | S          | M          | M          | S          |
| <b>CO4</b> | M          | M          | S          | S          | M          | S          |
| <b>CO5</b> | M          | M          | S          | S          | M          | S          |

S-strong; M- medium; L-low

### **UNIT -1 : General and applied plant physiology**

**(10 hrs)**

Photosynthesis- Light harvesting complexes: Mechanisms of electron transport, photo protective mechanisms; Co<sub>2</sub> fixation- C<sub>3</sub> pathway, C<sub>4</sub> pathway and CAM Pathways. Respiration: Citric acid cycle: Plant mitochondrial electron transport and ATP synthesis; alternate oxidase: Photo respiratory pathway. Transpiration: Cuticular transpiration, lenticular transpiration, Stomatal transpiration. Mechanism of Stomatal opening and closing-Activation of photo pumping, Synthesis of organic solutes, Factors influencing Transpiration, Internal factors-Transpiration Ratio.

**UNIT-2: Plant hormones and Nitrogen metabolism****(9 hrs)**

Plant hormones- Biosynthesis of plant hormones-types of plant hormones - Auxin (Tryptophan –dependent pathways, Tryptophan –Independent and physiological effects), storage, breakdown and transport, physiological effects& mechanism of actions. Nitrogen Metabolism: Nitrogen cycle- Denitrification, Anammox, Biological nitrogen fixation, Nitrate assimilation, ammonium assimilation: amino acid biosynthesis. Secondary metabolites- Sources of secondary metabolites, biosynthesis of terpenes, phenols and nitrogenous compounds and their roles.

**UNIT-3: Cellular physiology and Homeostasis****(10hrs)**

Blood corpuscles, haemopoiesis and formed elements, plasma function, blood volume, blood volume regulation, blood groups, haemoglobin, immunity, haemostasis. Cardiovascular System - Comparative anatomy of heart structure, myogenic heart, specialized tissue, ECG – its principle and significance, cardiac cycle, heart as a pump, blood pressure, neural and chemical regulation of all above.

**UNIT-4: Animal Reproduction****(8 hrs)**

**Reproduction:** Introduction, Types of reproduction –Asexual reproduction, Sexual reproduction: endogamy, exogamy, isogamy, anisogamy, conjugation and human reproductive system-accessory glands, male sexual response and hormonal control, spermatogenesis. Female reproductive system, ovaries structure, oogenesis, ovarian follicle development, female sexual response & hormone control.

**Unit-5: Renal physiology & Endocrinology****(8 hrs)**

Excretory system - Comparative physiology of excretion, kidney, urine formation, urine concentration, waste elimination, micturition, regulation of water balance, blood volume, blood pressure, electrolyte balance, acid-base balance. Stress and adaptation Digestive system - Digestion, absorption, energy balance, BMR. Endocrinology and reproduction - Endocrine glands, basic mechanism of hormone action hormones and diseases; reproductive processes, gametogenesis, oogenesis, neuro endocrine regulation.

**TEXT BOOKS:**

| S.NO | AUTHORS                           | TITLE                            | PUBLISHERS                      | YEAR OF PUBLICATION |
|------|-----------------------------------|----------------------------------|---------------------------------|---------------------|
| 1.   | <a href="#">S.C. Rastog</a>       | Essentials of Animal Physiology  | New age International Publisher | 2019                |
| 2.   | <a href="#">V. K. Jain</a> (Autho | Fundamentals of Plant Physiology | Paperback publisher             | 2017                |

|    |             |                                |  |      |
|----|-------------|--------------------------------|--|------|
|    | r)          |                                |  |      |
| 3. | P.B.Reddy's | Text Book of Animal Physiology | Ratna Prasad<br>Multidisciplinary<br>Research &<br>Educational Society | 2015 |

#### REFERENCE BOOKS:

| S.NO | AUTHORS                                     | TITLE                            | PUBLISHERS  | YEAR OF PUBLICATION |
|------|---|----------------------------------|---|---------------------|
| 1.   | <a href="#">H.R. Singh and Neeraj Kumar</a> | Animal Physiology & Biochemistry | Paperback publisher                               | 2017                |
| 2.   | Hema Sane                                   | Plant Physiology                 | Vision publication                                | 2014                |
| 3.   | <a href="#">Sarojini Chakravarthy</a>       | Plant Physiology                 | <a href="#">SIA Publishers &amp; Distributors</a> | 2019                |

#### WEB SOURCES

- <https://ssec.si.edu/stemvisions-blog/what-photosynthesis>
- [www.phytohormones.info/](http://www.phytohormones.info/)
- <https://www.pondermed.com>
- [www.animal-reproduction.org/](http://www.animal-reproduction.org/)
- <https://www.physiology.org/>

Syllabus Designer: Dr. J. Ilamathi

Assistant Professor

#### CELL AND MOLECULAR BIOLOGY AND GENETIC ENGINEERING

| Semester | Subject Code | Category         | Lecture | Theory | Practical      | Credit |
|----------|--------------|------------------|---------|--------|----------------|--------|
| I/II     |              | Core Practical I | 0       | 0      | 8 hrs per week | 4      |



**COURSE OBJECTIVE:**

- To create an opportunity to students for experimentally testing the principles and concepts studied in respective theory.

**LIST OF EXPERIMENTS:**

1. Cell fractionation
2. Replica plating.
3. Isolation of Genomic DNA from Bacteria
4. Isolation of Plasmid DNA from Bacteria
5. DNA Molecular size determination by Agarose Gel Electrophoresis
6. Restriction digestion
7. Ligation
8. PCR
9. SDS-PAGE
10. Southern blotting

**BIOMOLECULAR INTERACTIONS AND ENZYME TECHNOLOGY**

| Semester | Subject Code | Category          | Lecture | Theory | Practical      |     | Credit |
|----------|--------------|-------------------|---------|--------|----------------|-----|--------|
| I/II     |              | Core Practical II | 0       | 0      | 8 hrs per week | 120 | 4      |

**COURSE OBJECTIVES:**

- To provide an educational environment for the students to get an practical and research knowledge and excelling in careers of their choosing.

**LIST OF EXPERIMENTS:**

1. Qualitative and Quantitative analysis of Carbohydrates and amino acids.
2. Protein Estimation by Lowry's Method
3. Carbohydrate estimation by anthrone method
4. Paper Chromatography
5. Thin Layer Chromatography (TLC)
6. Isolation of protease enzyme from any bacterial source.

7. Enzyme characterization - Effect of various pH and temperature for amylase activity.
8. Preparation of different concentration of sodium alginate beads for immobilization.
9. Partial purification of amylase using slat/solvent precipitation method
10. Isolation of cellulase producing bacteria.

### **MICROBIOLOGY AND IMMUNOTECHNOLOGY**

| Semester | Subject Code | Category              | Lecture | Theory | Practical            |     | Credit |
|----------|--------------|-----------------------|---------|--------|----------------------|-----|--------|
| I/II     |              | Core Practical<br>III | 0       | 0      | 8 hrs<br>per<br>week | 120 | 4      |

#### **COURSE OBJECTIVE:**

- To properly obtain culture, identify, and explain microorganisms in environmental cultures and basic understanding of various immunological techniques.

#### **LIST OF EXPERIMENTS:**

1. Isolation and enumeration of microorganisms from air soil and water (fungi, bacteria and actinomycetes) using pure culture techniques – pour/streak/spread.
2. Staining (differential and LCPCB)
3. Estimate the concentration of viable organism – MPN method.
4. Biochemical tests
5. Determine minimal inhibitory concentration (MIC) of an antibiotic using double dilution technique
6. Latex agglutination inhibition test
7. Immunoelectrophoresis
8. Single Radial Immunodiffusion
9. Ouchterlony Double Diffusion
10. ELISA

## **DEPARTMENT OF MICROBIOLOGY-UG**

### **B.Sc MICROBIOLOGY SYLLABUS TEMPLATE 2019-2020**

| S.N<br>O    | Part | Study Components |             | Ins.Hrs/<br>Week | Credit | Title of the Paper               | Max Marks |          |       |
|-------------|------|------------------|-------------|------------------|--------|----------------------------------|-----------|----------|-------|
|             |      | Course Title     |             |                  |        |                                  | CIA       | Sem.Exam | Total |
| SEMESTER I  |      |                  |             |                  |        |                                  |           |          |       |
| 1           | I    | Language         | Paper I     | 6                | 4      | Tamil-I                          | 25        | 75       | 100   |
| 2           | II   | English          | Paper I     | 6                | 4      | English –I                       | 25        | 75       | 100   |
| 3           | III  | Core             | Paper I     | 6                | 5      | General Microbiology             | 25        | 75       | 100   |
| 4           | III  | Core             | Practical I | 3                | 0      | Basic techniques in Microbiology | 0         | 0        | 0     |
| 5           | III  | Allied           | Paper I     | 4                | 4      | Biochemistry I                   | 25        | 75       | 100   |
| 6           | III  | Allied           | Practical I | 3                | 0      | Biochemistry                     | 0         | 0        | 0     |
| 7           | IV   |                  |             | 2                | 2      | Environmental Science            | 25        | 75       | 100   |
|             |      |                  |             | 30               | 19     |                                  | 125       | 375      | 500   |
|             |      |                  |             |                  |        |                                  |           |          |       |
| SEMESTER II |      |                  |             |                  |        |                                  | CIA       | Sem.Exam | Total |
| 8           | I    | Language         | Paper II    | 6                | 4      | Tamil-II                         | 25        | 75       | 100   |
| 9           | II   | English          | Paper II    | 5                | 4      | English-II                       | 25        | 75       | 100   |
| 10          | III  | Core             | Paper       | 5                | 5      | Cell biology                     | 25        | 75       | 100   |

|                     |     |          |              |           |           |  |             |                 |              |
|---------------------|-----|----------|--------------|-----------|-----------|--|-------------|-----------------|--------------|
|                     |     |          | II           |           |           | and Genetics                                       |             |                 |              |
| 11                  | III | Core     | Practical I  | 3         | 3         | Basic techniques in Microbiology                   | 40          | 60              | 100          |
| 12                  | III | Allied   | Paper II     | 4         | 4         | Biochemistry II                                    | 25          | 75              | 100          |
| 13                  | III | Allied   | Practical I  | 3         | 2         |  | 40          | 60              | 100          |
| 14                  | IV  |          |              | 2         | 2         | Value Education (Gen Awareness)                    | -           | 50              | 50           |
| 15                  | IV  |          |              | 2         | 1         | Soft skill   | -           | 50              | 50           |
|                     |     |          |              | <b>30</b> | <b>25</b> |  | <b>180</b>  | <b>520</b>      | <b>700</b>   |
|                     |     |          |              |           |           |  |             |                 |              |
| <b>SEMESTER III</b> |     |          |              |           |           |  | <b>CI A</b> | <b>Sem.Exam</b> | <b>Total</b> |
| 16                  | I   | Language | Paper III    | 6         | 4         | Tamil-III  |             |                 |              |
| 17                  | II  | English  | Paper III    | 6         | 4         | English-III  | 25          | 75              | 100          |
| 18                  | III | Core     | Paper III    | 4         | 4         | Immunology   | 25          | 75              | 100          |
| 19                  | III | Core     | Practical II | 3         | 0         | Immunology   | 0           | 0               | 0            |
| 20                  | III | Allied   | Paper III    | 4         | 4         | Comp in biology & Biostatistics                    | 25          | 75              | 100          |
| 21                  | III | Allied   | Practical II | 3         | 0         | Comp in biology Biostatistics & Bioinstrumentation | 0           | 0               | 0            |

|                     |     |                      |            |           |           |   |             |                  |               |
|---------------------|-----|----------------------|------------|-----------|-----------|---|-------------|------------------|---------------|
| 22                  | IV  | Skill Based I        |            | 2         | 2         | MLT – I General principles of labarotary techniques, anatomy & physiology |             | 50               | 50            |
| 23                  | IV  | Non Major Elective I |            | 2         | 2         | Mushroom cultivation  |             | 50               | 50            |
|                     |     |                      |            | <b>30</b> | <b>20</b> |   | <b>100</b>  | <b>400</b>       | <b>500</b>    |
|                     |     |                      |            |           |           |   |             |                  |               |
| <b>SEMESTER –IV</b> |     |                      |            |           |           |   | <b>CI A</b> | <b>Sem.Ex am</b> | <b>Tot al</b> |
| 24                  | I   | Langua ge            | Paper IV   | 6         | 4         | Tamil-IV  | 25          | 75               | 100           |
| 25                  | II  | English              | Paper IV   | 6         | 4         | English-IV  | 25          | 75               | 100           |
| 26                  | III | Core                 | Paper IV   | 4         | 4         | Molecular biology   | 25          | 75               | 100           |
| 27                  | III | Core                 | Practic al | 3         | 3         | Immunology  | 40          | 60               | 100           |
| 28                  | III | Allied               | Paper IV   | 4         | 4         | Bioinstrumenta tion   | 25          | 75               | 100           |
| 29                  | III | Allied               | Practic al | 3         | 2         | Computers in biology, Biostatistics & Bioinstrumenta tion.                | 40          | 60               | 100           |
| 30                  | IV  | Skill Based II       |            | 2         | 2         | MLT – II Clinical Pathology &Haematology                                  |             |                  | 50            |

|    |    |                       |  |           |           |                 |            |            |            |
|----|----|-----------------------|--|-----------|-----------|-----------------|------------|------------|------------|
| 31 | IV | Non Major Elective II |  | 2         | 2         | Vermitechnology |            |            | 50         |
|    |    |                       |  | <b>30</b> | <b>25</b> |                 | <b>180</b> | <b>420</b> | <b>700</b> |
|    |    |                       |  |           |           |                 |            |            |            |

| <b>SEMESTER –V</b> |     |                 |               |           |           |                                       | <b>CIA</b> | <b>Sem.Exam</b> | <b>Total</b> |
|--------------------|-----|-----------------|---------------|-----------|-----------|---------------------------------------|------------|-----------------|--------------|
| 32                 | III | Core            | Paper V       | 5         | 5         | Medical Bacteriology                  | 25         | 75              | 100          |
| 33                 | III | Core            | Paper VI      | 4         | 4         | Food & Dairy Microbiology             | 25         | 75              | 100          |
| 34                 | III | Core            | Paper VII     | 4         | 4         | Medical Mycology & Parasitology       | 25         | 75              | 100          |
| 35                 | III | Core            | Practical III | 5         | 0         | Medical Microbiology                  | 0          | 0               | 0            |
| 36                 | III | Elective I      | Paper I       | 3         | 3         | Recombinant DNA technology            | 25         | 75              | 100          |
| 37                 | III | Elective II     | Paper II      | 3         | 3         | Pharmaceutical Microbiology           | 25         | 75              | 100          |
| 38                 | IV  | Skill Based III |               | 2         | 2         | MLT – III Biochemistry Histopathology | 0          | 50              | 50           |
|                    |     |                 |               | <b>30</b> | <b>21</b> |                                       | <b>125</b> | <b>425</b>      | <b>550</b>   |

| <b>SEMESTER-VI</b> |     |                      |               |            |            |  | <b>CIA</b> | <b>Sem.Exam</b> | <b>Total</b> |
|--------------------|-----|----------------------|---------------|------------|------------|--|------------|-----------------|--------------|
| 39                 | III | Core                 | Paper VIII    | 5          | 5          | Medical Virology                           | 25         | 75              | 100          |
| 40                 | III | Core                 | Paper IX      | 4          | 4          | Environmental & Agricultural Microbiology  | 25         | 75              | 100          |
| 41                 | III | Core                 | Paper X       | 4          | 4          | Industrial and Pharmaceutical Microbiology | 25         | 75              | 100          |
| 42                 | III | Core                 | Practical III | 5          | 3          | Medical Microbiology                       | 40         | 60              | 100          |
| 43                 | III | Core                 | Practical IV  | 4          | 3          | Applied Microbiology                       | 40         | 60              | 100          |
| 44                 | III | Elective III         | Paper III II  | 3          | 3          | Microbial Biotechnology                    | 25         | 75              | 100          |
| 45                 | III | Elective IV          | Paper IV      | 3          | 3          | Marine Microbiology                        | 25         | 75              | 100          |
| 46                 | IV  | Skill Based IV       |               | 2          | 2          | MLT – IV Clinical Microbiology             | 0          | 50              | 50           |
| 47                 | V   | Extension Activities |               |            | 3          | Service                                    | 100        | 0               | 100          |
|                    |     |                      |               | <b>30</b>  | <b>30</b>  |  | <b>255</b> | <b>545</b>      | <b>850</b>   |
|                    |     |                      |               | <b>180</b> | <b>140</b> |  |            |                 | <b>3800</b>  |

## CONSOLIDATED STATEMENT

| Part     | Subject               | Papers    | Credit | Total credits | Marks       | Total marks |
|----------|-----------------------|-----------|--------|---------------|-------------|-------------|
| Part I   | Languages             | 4         | 4      | 16            | 100         | 400         |
| Part II  | English               | 4         | 4      | 16            | 100         | 400         |
| Part III | Allied (Odd Sem)      | 2         | 4      | 8             | 100         | 200         |
|          | Allied (Even Sem)     | 2         | 4      | 8             | 100         | 200         |
|          | Allied Prac(Even Sem) | 2         | 2      | 4             | 100         | 200         |
|          | Electives             | 4         | 3      | 12            | 100         | 400         |
|          | Core                  | 10        | 4-5    | 44            | 100         | 1000        |
|          | Core prac             | 4         | 3      | 12            | 100         | 400         |
| Part IV  | Env. Science          | 1         | 2      | 2             | 100         | 100         |
|          | Soft skill            | 1         | 1      | 1             | 50          | 50          |
|          | Value Education       | 1         | 2      | 2             | 50          | 50          |
|          | Non major             | 2         | 2      | 4             | 50          | 100         |
|          | Skill based           | 4         | 2      | 8             | 50          | 200         |
| Part V   | Extension             | 1         | 3      | 3             | 100         | 100         |
|          | <b>Total</b>          | <b>42</b> |        | <b>140</b>    | <b>1200</b> | <b>3800</b> |

### PROGRAM EDUCATIONAL OBJECTIVES:

**PEO1** To enable the students to know about the basics of Microbiology and its applications in various fields

**PEO2** To inculcate in-depth knowledge and research skills for professional careers in Microbiology.

### PROGRAMME OUTCOMES:

**PO1** The students acquire thorough knowledge of understanding the core concepts in the discipline of Microbiology.

**PO2** Students acquire the knowledge of the indispensable role of microorganisms in the environment including elemental cycles, biodegradation and bioremediation.



**PO3** The students understand the vital role of microorganisms in biotechnology and can find job in food, dairy and fermentation industries.

**PO4** Students identify the ways how microorganism's causes disease, and the methodologies used in disease treatment and prevention.

**PO5** The course imparts knowledge in laboratory safety and in routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods including accurately reporting observation and analysis.

**PO6** The students develop good, deep knowledge and strong skills to work in pharmaceutical industries that produce biopharmaceuticals and in multi specialty hospitals.

#### **CORE I**

#### **GENERAL MICROBIOLOGY**

| Semester | Subject code | Category | Lecture   |           | Theory    |            | Practical |           | Credit |
|----------|--------------|----------|-----------|-----------|-----------|------------|-----------|-----------|--------|
|          |              |          | Total hrs | Hrs/ week | Total hrs | Hrs / week | Total hrs | Hrs/ week |        |
| I        |              | Core     | 90        | 6         | 90        | 6          | 0         | 0         | 5      |

#### **COURSE OBJECTIVES**

To enable the students to understand the basics in Microbiology

#### **COURSE OUTCOMES**

On the successful completion of the course, students will be able to know the basics in Microbiology.

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To understand the knowledge about the microscopes & the contributions of various scientists to the microbial world. | K2                      |
| <b>CO2</b> | To understand the nomenclature & classification of microorganisms.  | K2                      |
| <b>CO3</b> | To understand the sterilization techniques & the role of antibiotics in the control of                              | K2                      |

|            |  |    |
|------------|--|----|
|            | microorganisms.  |    |
| <b>CO4</b> | To understand the staining & cultivation techniques of different microorganisms.                 | K2 |
| <b>CO5</b> | To understand about the growth pattern & nutrient uptake mechanisms of different microorganisms. | K2 |

#### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | M          | M          | S          | M          |
| <b>CO3</b> | S          | M          | M          | S          | M          | M          |
| <b>CO4</b> | S          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | M          | S          | M          | S          | M          |

**S- Strong; M- Medium; L- Low**

#### **Unit-I: History and Microscopy**

**(20 Hrs)**

Definition, branches and scope of microbiology – History – Contributions of Antony Van Leewenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Beijerinck, Winogradsky, Alexander Fleming Selman Waksman, Lazarro Spallanzani and John Tyndall. Spontaneous generation and biogenesis. Branches of Microbiology – Industrial, medical and Environmental microbiology. Microscopy – Simple, Compound – Light, Dark, Phase contrast and Fluorescent microscopes. Electron microscopy – Transmission and scanning electron microscopes.

#### **Unit-II: Microbial Classification and Taxonomy**

**(18 Hrs)**

Microbial kingdoms: Woese classification - Bacteria, Eubacteria, Archaeobacteria, Hackels three kingdom classification and Whittaker's five kingdom classification. General characteristics of algae, fungi & viruses. Anatomy of Prokaryotes – Ultra structure and function of cell wall, flagella, slime layer, capsule, pili, cytoplasmic membrane, cytoplasmic inclusions and endospore. Mechanism of spore germination and sporulation.

#### **Unit-III: Sterilization and Antimicrobial chemotherapy**

**(17 Hrs)**

Definitions: Sterilization, flaming, incineration, disinfection and antiseptics. Sterilization principles & techniques – dry heat, moist heat, pasteurization, tyndallization, radiation and filtration. Disinfection methods. Antimicrobial chemotherapy: Classification & mode of action of antibiotics [Cellwall synthesis inhibitors, antibiotic causes damage to cell membrane, inhibitors of protein & nucleic acid synthesis and inhibitors of specific enzyme system]: Testing methods – disc diffusion and dilution susceptibility [MIC] test.

**Unit-IV: Culture and Staining techniques****(17 Hrs)**

Culture media and its types – basal, enriched, enrichment, selective, differential, transport & anaerobic media. Preservation of cultures – Lyophilization – aerobic and anaerobic culture techniques. Stains and staining techniques – Simple staining, differential staining [Gram staining & Acid fast staining], special staining [capsule staining & endospore staining].

**Unit-V: Bacterial growth and metabolism****(18Hrs)**

Microbial growth – factors affecting microbial growth, techniques for quantifying microbial growth. Nutritional requirements – Growth factors - Growth curve. Microbial metabolism: Respiration – aerobic respiration [ETC, TCA Cycle], Anaerobic respiration [Glycolysis]; fermentation and Photosynthesis [Cyclic & Non-cyclic]. Photosynthetic bacteria.

**TEACHING METHODOLOGY:**

- ❖ Lectures
- ❖ Power point presentation
- ❖ Charts
- ❖ Models
- ❖ Group discussion
- ❖ Group assignments

**TEXT BOOKS:**

| Sl no: | Book Name                              | Author  | Publisher                             | Year of Publication |
|--------|--|---|---------------------------------------|---------------------|
| 01     | General Microbiology                   | Robert F. Boyd  | Times/Missor/Mosby College Publishers | 1998                |
| 02     | Fundamental Principles of Bacteriology | Salle A.J   | McGraw Hill Publishers                | 1992                |
| 03     | Microbiology                           | Pelczar JR M.J., Chan E.C.S. and Kreig N.R            | McGraw Hill Publishers                | 2006                |
| 04     | Brock – Biology of Microorganisms      | Michael T. Madigan, John M. Martin K, Jack Parker     | Prentice Hall, Pearson Education      | 2003                |
| 05     | Microbial Physiology                   | Albert G. Moat, John W. Foster and Michael P. Spector | John Wiley and Sons                   | 2002                |

**REFERENCE BOOKS:**

| Sl no : | Book Name                                     | Author  | Publisher                                  | Year of Publication |
|---------|---|---|--|---------------------|
| 01      | Manual for identification of Medical Bacteria | Cowan and Steel   | Cambridge University Press                 | 1995                |
| 02      | Introduction to Microbiology                  | John L.Ingraham & Catherine A   | Ingraham. Book/Cole Thomson Learning       | 2000                |
| 03      | Fundamentals of Microbiology                  | Edward Alcamo I   | Jones and Barlett Publishers               | 2001                |
| 04      | Biology of Microorganisms                     | Brock   | Prentice Hall, Pearson education           | 2000                |
| 05      | Bergey's Manual of Determinative Bacteriology | John G. Holt, Noel R. Krieg, Peter H.A, James T. Staley and Stanely T. Williams | Lippincott Williams and Wilkins Publishers | 2000                |
| 06      | Microbiology                                  | Prescott.M, JP Harley and D.A. Klein  | Brown Publishers                           | 1993                |

**WEB SOURCES:**

<http://gsbs.utmb.edu/microbook/toc.htm>

<http://www.sci-eng.mmu.ac.uk/biology/useful/27.htm>.

[http://www.microbes.info./resources/general\\_Microbiology/](http://www.microbes.info./resources/general_Microbiology/)

[www.microbiologyplace.com](http://www.microbiologyplace.com)

<http://www.med.umich.edu/tamc/links.html>

**SYLLABUS DESIGNER:**

1. Mrs. A. Barathi Assistant Professor
2. Dr. A.Vidhya HOD & Assistant Professor

## I – SEMESTER: PRACTICALS

### BASIC TECHNIQUES IN MICROBIOLOGY

| Semester | Subject code | Category  | Lecture   |           | Theory    |            | Practical |           | Credit |
|----------|--------------|-----------|-----------|-----------|-----------|------------|-----------|-----------|--------|
|          |              |           | Total hrs | Hrs/ week | Total hrs | Hrs / week | Total hrs | Hrs/ week |        |
| I        |              | Practical | 0         | 0         | 0         | 0          | 45        | 3         | 6      |

1. Cleaning of glass wares.
2. Sterilization principle and methods – moist heat, dry heat and filtration methods.
3. Media preparation – Liquid medium, solid medium, slants, deeps, agar plates. Preparation of basal, enriched, selective and differential media.
4. Pure culture techniques – serial dilution, pour plate, spread plate and streak plate techniques.
5. Cultural and biochemical characteristics of bacteria – Growth on different media, colony characteristics on Nutrient agar, Blood agar, Mac Conkey agar. Catalase, oxidase and IMVIC tests.
6. Microscopy – light microscopy & dark field microscopy.
7. Motility demonstration – Hanging drop technique.
8. Staining techniques – simple staining, Gram's staining, Acid fast staining, capsule staining (Negative staining), Lactophenol cotton blue staining techniques.
9. Antibiotic sensitivity testing – Disc diffusion method.

## CORE II

### CELL BIOLOGY AND GENETICS

| Semester | Subject Code | Category | Lecture   |           | Theory    |            | Practical |           | Credit |
|----------|--------------|----------|-----------|-----------|-----------|------------|-----------|-----------|--------|
|          |              |          | Total hrs | Hrs/ week | Total hrs | Hrs / week | Total hrs | Hrs/ week |        |
| II       |              | Core     | 75        | 5         | 75        | 5          | 0         | 0         | 5      |

### COURSE OBJECTIVES

To enable the students to understand the basics of Cell Biology and Genetics

## COURSE OUTCOMES

On the successful completion of the course, students will be able to acquire a sound knowledge about generating, processing and understanding biological genetic information.

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | To understand about the anatomy, cell division & Cell differentiation of the microorganisms.     | K2                      |
| CO2       | To understand about the properties and functions of genes through Mendelian inheritance studies. | K2                      |
| CO3       | To understand about the methods of gene transfer.  | K2                      |
| CO4       | To understand about the plasmids, their functions & uses in microbiology.                        | K2                      |
| CO5       | To understand about the occurrence of mutation & its detection in microorganisms.                | K2                      |

## MAPPING WITH PROGRAMME OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | M   | S   | S   |
| CO2 | M   | S   | M   | S   | M   | M   |
| CO3 | M   | M   | S   | S   | M   | M   |
| CO4 | M   | S   | S   | M   | S   | S   |
| CO5 | S   | M   | M   | S   | S   | M   |

**S- Strong; M- Medium; L- Low**

### Unit-I: Cell biology

**(15 Hrs)**

Structure and function of cells and intracellular organelles of both prokaryotes and eukaryotes. Mechanism of cell division (Mitosis) - cell differentiation - cell interaction - microbial cell membrane & its functions – bacteria [Gram positive & Gram negative].

### Unit- II: Microbial Genitics

**(15 Hrs)**

Genetic inheritance; Microbial genome – structure and function; Linkage and Crossing over; Extra chromosomal inheritance (mitochondria). Epigenesis; Genotypic and phenotypic characteristics – bacteria.

**Unit III: Microbial Gene transfer mechanisms****( 15 Hrs)**

Gene transfer mechanisms: Transformation – Griffith experiment; Conjugation – F<sup>+</sup>, F' & Hfr methods; Transduction – Generalized and specialized.

**Unit-IV: Plasmids and Genetic recombination****(15 Hrs)**

Plasmids – general properties: size, copy number, compatibility, origin of replication, conjugation and amplification. Classification of Plasmid – Col plasmids, resistant plasmids, degradative plasmids, virulent plasmids (Ti plasmid) & cryptic plasmids. Episomes, Transposons. Molecular mechanism of genetic recombination

**Unit-V: Mutagenesis and mutation****(15 Hrs)**

Mutagenesis – mutation and its molecular basis – types of mutation – Addition, deletion, reversion, lethal, transition, transversion, frameshift, point and non-sense mutations. Mutation repair mechanisms – excision repair, post replication repair, recombinational repair and SOS repair. Detection and isolation of mutants - Isolation of auxotrophic mutants; Carcinogenicity testing – Ames test.

**TEACHING METHODOLOGY:**

- ❖ Lectures
- ❖ Power point presentation
- ❖ Charts
- ❖ Models
- ❖ Group discussion
- ❖ Group assignments

**TEXT BOOKS:**

| Sl no: | Book name                                  | Author  | Publisher                       | Year of publication |
|--------|--|---|---------------------------------|---------------------|
| 02     | DNA repair and mutagenesis                 | Friedberg E.C.,<br>Walter GC, Sied. W             | ASM press                       | 1995                |
| 03     | The Genetics of Bacteria and their Viruses | William Hayes                                     | Blackwell Scientific Publishers | 1985                |
| 04     | Principles of Genetics                     | Gardner, E.J.<br>Simmons, M.J and<br>D.P Snustard | John Wiley & Sons               | 1991                |
| 05     | Principles of Genetics                     | Robert H. Tamarin                                 | Tata McGraw Hill Publication    | 2004                |
| 06     | Cell and Molecular                         | Gerald Karp                                       | John Wiley & Sons               | 2002                |

|    |                        |  |                                 |      |
|----|------------------------|--|---------------------------------|------|
|    | Biology                |  |                                 |      |
| 07 | Genetics               | Peter J Russell                          | Benjamin Cummings               | 2002 |
| 08 | Principles of Genetics | Peter Snustard D.,<br>Michael J. Simmons | John Wiley & Sons               | 2003 |
| 09 | Genetics               | Ahluwalia, K.B                           | New Age International Pvt., Ltd | 1996 |

#### **REFERENCE BOOKS:**

| <b>Sl No:</b> | <b>Book name</b>                        | <b>Author</b>                   | <b>Publisher</b>             | <b>Year of publication</b> |
|---------------|---|---------------------------------|------------------------------|----------------------------|
| 01            | Molecular Biotechnology                 | Glick, B.R. and Pasternak, J.J. | ASM Press                    | 1994                       |
| 02            | Molecular Cloning – A Laboratory Manual | Sambrook, J. and Ruseell, D.W.  | Cold Spring Laboratory Press | 2001                       |

#### **WEB SOURCES:**

<http://www.molgen.mpg.de/>

<http://www.cellbio.com/>

<http://restools.sdsc.edu/>

<http://www.mcb.harvard.edu/biolinks.html>

<http://www.horizonpress.com/gateway>

#### **SYLLABUS DESIGNER:**

1. Mrs. A. Barathi, Assistant Professor
2. Dr. A.Vidhya HOD & Assistant Professor

#### **APPLIED MICROBIOLOGY-PG**

#### **PROGRAM EDUCATIONAL OBJECTIVES:**

**PEO1** To enable the students to know about the basics of Microbiology and its applications in various fields

**PEO2** To inculcate in-depth knowledge and research skills for professional careers in Microbiology.



**PROGRAMME OUTCOMES:**

**PO1** The students acquire the knowledge of prokaryotic and eukaryotic cellular processes, classification, interaction of microorganisms among themselves, with physical and chemical agents and higher order organisms.

**PO2** The course provides the conceptual basis for understanding pathogenic microorganisms and the mechanisms by which they cause disease.

**PO3** The students effectively utilize the microorganisms to develop sustainable solutions to current and future environmental problems.

**PO4** The course provide the laboratory training in addition to theory and to prepare them for careers in the industry, agriculture, and applied research where biological system is increasingly employed.

**PO5** Students are exposed to various techniques through their research projects and by internship training.

**PO6** The students develop knowledge in ethical thinking, quantitative analytical; skills and its application to issues in society.

**DEPARTMENT OF MICROBIOLOGY -PG****M.Sc MICROBIOLOGY SYLLABUS TEMPLATE 2019-2020**

| S.No       | Study components |               | Ins.Hrs / Week | Cred<br>it | Title of the paper                          | Maximum Marks |             |           |
|------------|------------------|---------------|----------------|------------|---|---------------|-------------|-----------|
|            | Course Title     |               |                |            |   |               |             |           |
| SEMESTER I |                  |               |                |            |   | CIA           | Sem.<br>Exa | Tota<br>l |
| 1          | Core             | Paper-I       | 4              | 4          | General Microbiology                        | 25            | 75          | 100       |
| 2          | Core             | Paper-II      | 4              | 4          | Immunology                                  | 25            | 75          | 100       |
| 3          | Core             | Paper-III     | 4              | 4          | Systematic Medical Bacteriology             | 25            | 75          | 100       |
| 4          | Elective I       | Paper-I       | 3              | 3          | Advances in Molecular Biology and Microbial | 25            | 75          | 100       |
| 5          | Core             | Practic al I  | 5              | 0          | General and Applied Microbiology            | 0             | 0           | 0         |
| 6          | Core             | Practic al II | 5              | 0          | Immunology and Medical Bacteriology         | 0             | 0           | 0         |
| 7          | Core             | Practic       | 5              | 0          | Genetic Engineering                         | 0             | 0           | 0         |
|            |                  |               | 30             | 15         |   | 100           | 300         | 400       |

|                     |                             |               |           |           |  |            |                 |              |
|---------------------|-----------------------------|---------------|-----------|-----------|--|------------|-----------------|--------------|
| 8                   | Self study paper (optional) |               |           | 2         | Organic Farming                                  |            |                 |              |
| <b>SEMESTER II</b>  |                             |               |           |           |  | <b>CIA</b> | <b>Sem. Exa</b> | <b>Total</b> |
| 9                   | Core.                       | Paper-IV      | 3         | 3         | Virology   | 25         | 75              | 100          |
| 10                  | Core                        | Paper-VI      | 4         | 4         | Genetic Engineering                              | 25         | 75              | 100          |
| 11                  | Core                        | Paper-V       | 3         | 3         | Applied Food, Dairy & Environmental Microbiology | 25         | 75              | 100          |
| 12                  | Elective II                 | Paper-II      | 3         | 3         | Biological techniques                            | 25         | 75              | 100          |
| 13                  | <b>Compulsory Paper</b>     |               | 2         | 2         | <b>Human Rights</b>                              | 25         | 75              | 100          |
| 14                  | Core                        | Practical I   | 5         | 5         | General and Applied Microbiology                 | 40         | 60              | 100          |
| 15                  | Core                        | Practical II  | 5         | 5         | Immunology and Medical Bacteriology              | 40         | 60              | 100          |
| 16                  | Core                        | Practical III | 5         | 5         | Genetic Engineering                              | 40         | 60              | 100          |
|                     |                             |               | <b>30</b> | <b>30</b> |  | <b>245</b> | <b>555</b>      | <b>800</b>   |
| <b>SEMESTER III</b> |                             |               |           |           |  | <b>CIA</b> | <b>Sem. Exa</b> | <b>Total</b> |
| 17                  | Core                        | Paper VII     | 4         | 4         | Medical Parasitology, Mycology and Entomology    | 25         | 75              | 100          |
| 18                  | Core                        | Paper VIII    | 4         | 4         | Industrial and Pharmaceutical Microbiology       | 25         | 75              | 100          |
| 19                  | Core                        | Paper IX      | 4         | 4         | Advances in Biotechnology                        | 25         | 75              | 100          |
| 20                  | Elective III                | Paper III     | 3         | 3         | IPR, Bio safety and Quality control              | 25         | 75              | 100          |
| 21                  | Core                        | Practical IV  | 5         | 0         | Medical Parasitology, Mycology and Entomology    | 0          | 0               | 0            |
| 22                  | Core                        | Practical V   | 5         | 0         | Industrial and Pharmaceutical Microbiology       | 0          | 0               |              |
| 23                  | Core                        | Practical VI  | 5         | 0         | Advances in Biotechnology                        | 0          | 0               | 0            |
|                     |                             |               | <b>30</b> | <b>15</b> |  | <b>10</b>  | <b>300</b>      | <b>400</b>   |

|                    |                  |              |            |           |   |            |                  |              |
|--------------------|------------------|--------------|------------|-----------|---|------------|------------------|--------------|
| 24                 | Self study paper |              |            | 2         | Laboratory Animal Science                     |            |                  |              |
| <b>SEMESTER IV</b> |                  |              |            |           |   |            |                  |              |
|                    |                  |              |            |           |   | <b>CIA</b> | <b>Sem. Exam</b> | <b>Total</b> |
| 24                 | Core             | Paper X      | 6          | 6         | Research Methodology                          | 25         | 75               | 100          |
| 25                 | Core             | Elective IV  | 3          | 3         | Biostatistics                                 | 25         | 75               | 100          |
| 26                 | Core             | Practical IV | 5          | 5         | Medical Parasitology, Mycology and Entomology | 40         | 60               | 100          |
| 27                 | Core             | Practical V  | 5          | 5         | Industrial and Pharmaceutical Microbiology    | 40         | 60               | 100          |
| 28                 | Core             | Practical VI | 5          | 5         | Advances in Biotechnology                     | 40         | 60               | 100          |
| 29                 | Core             | Project      | 6          | 6         | Project/ Dissertation                         | 25         | 75               | 100          |
|                    |                  |              | <b>30</b>  | <b>30</b> |   | <b>195</b> | <b>405</b>       | <b>600</b>   |
|                    |                  |              | <b>120</b> | <b>90</b> |   |            | <b>2200</b>      |              |

| Subject          | Papers    | Credit   | Total credits | Marks    | Total marks |
|------------------|-----------|----------|---------------|----------|-------------|
| Main             | 10        | 3-6      | 40            | 100      | 1000        |
| Main Practical   | 6         | 5        | 30            | 100      | 600         |
| Elective         | 4         | 3        | 12            | 100      | 400         |
| Compulsory paper | 1         | 2        | 2             | 100      | 100         |
| Project          | 1         | 6        | 6             | 100      | 100         |
| <b>Total</b>     | <b>22</b> | <b>-</b> | <b>90</b>     | <b>-</b> | <b>2200</b> |

**M.SC APPLIED MICROBIOLOGY****CORE – I****GENERAL MICROBIOLOGY**

| Semester | Subject code | Category | Lecture   |           | Theory    |            | Practical |           | Credit |
|----------|--------------|----------|-----------|-----------|-----------|------------|-----------|-----------|--------|
|          |              |          | Total hrs | Hrs/ week | Total hrs | Hrs / week | Total hrs | Hrs/ week |        |
| I        |              | Core     | 75        | 5         | 75        | 5          | 0         | 0         | 5      |

**COURSE OBJECTIVES**

To enable the students to understand the basics in Microbiology.

**COURSE OUTCOMES**

On the successful completion of the course, students will be able to develop strong and potential skills in the various aspects of Microbiology.

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To analyze the isolation and differentiates of microorganisms based on their genotypic & phenotypic properties. | <b>K3</b>               |
| <b>CO2</b> | To experiment their deep knowledge of staining and cultivation processes of microorganisms.                     | <b>K2</b>               |
| <b>CO3</b> | To estimate their deep insight about the internal features of the microorganisms.                               | <b>K2</b>               |
| <b>CO4</b> | To analyze the metabolism of carbohydrates, proteins & amino acids in microbes.                                 | <b>K2</b>               |
| <b>CO5</b> | To execute the knowledge about the physiology of microorganisms.  | <b>K3</b>               |

**MAPPING WITH PROGRAMME OUTCOMES:**

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | S   | S   | S   | S   | S   |
| <b>CO2</b> | M   | S   | M   | S   | S   | S   |
| <b>CO3</b> | S   | S   | S   | S   | S   | S   |
| <b>CO4</b> | S   | M   | M   | S   | S   | S   |
| <b>CO5</b> | S   | M   | M   | S   | S   | S   |

**S- Strong; M- Medium; L- Low**

**Unit -I: Taxonomy**

**(15 Hrs)**

Evolutionary perspectives of Microbiology, its recent developments and contemporary applications. Differences and similarities in microbes – Phenotypic and taxonomic characters – Distinctive characters of major groups of microorganisms – Principles of classification – culture dependent (DNA analysis, 16s r RNA analysis), culture independent techniques (metagenomics). Numerical taxonomy, taxonomic structuring – classification of bacteria according to Bergey's manual.

**Unit -II: Microscopy and staining techniques (15 Hrs)**

Microscopy and its applications in the field of Microbiology including bright field, dark field phase contrast, fluorescent, electron, confocal and atomic force microscopy. Stains and dyes – Principles of different staining techniques; Sterilization techniques – hot & cold sterilization methods, Quality control.

**Unit – III: Bacterial anatomy and Bacterial growth (15 Hrs)**

Bacterial anatomy, structure, properties and biosynthesis of cellular components. Sporulation and its mechanism. Nutritional requirements & classification – autotrophs, heterotrophs. Enrichment cultures – Growth curve – kinetics of growth – primary & secondary metabolites. Techniques for pure culture. Archaeobacteria – evolution of archae, archaeobacterial membranes, cell wall and metabolism. Differentiation of Archaeobacteria and Eubacteria.

**Unit – IV: Microbial metabolism (15 Hrs)**

Carbohydrate metabolism – Glycogen breakdown & synthesis, Gluconeogenesis. Amino acid metabolism, biosynthesis of purines and pyrimidines; Lipid metabolism -  $\beta$  oxidation of fatty acids. Photosynthesis.

**Unit -V: Microbial Biodiversity (15 Hrs)**

Physiology of organisms living in extreme environments – thermophiles, halophiles, psychrophiles and Methanogens. Antimicrobial chemotherapy – source, mode of action, resistance and testing methods. Pigment production, characterization, extraction and applications. Bioluminescence.

**TEACHING METHODOLOGY:**

- ❖ Lectures
- ❖ Power point presentation
- ❖ Charts
- ❖ Models
- ❖ Group discussion
- ❖ Group assignments

❖ **Seminars**

**TEXT BOOKS:**

| <b>Sl No:</b> | <b>Book Name</b>          | <b>Author</b>  | <b>Publisher</b>                                 | <b>Year of Publication</b> |
|---------------|---------------------------|--|--|----------------------------|
| 01            | Microbiology              | Davis B.D. Delbecco R, Eisen H .N and Ginsburg H .S. | Harper & Row                                     | 1990                       |
| 02            | Text book of Microbiology | D.R.Arora,   | CBS Publishers & Distributors                    | 2003                       |
| 03            | General Microbiology      | Boyd, Robert F                                       | Times Mirror . Mosby college Publishing St Louis | 1998                       |
| 04            | Microbiology              | Pelczar, Michael J, Chan, E C S                      | Mc Graw-Hill                                     | 1999                       |

**REFERENCE BOOKS:**

| <b>Sl No:</b> | <b>Book Name</b>                              | <b>Author</b>   | <b>Publisher</b>                     | <b>Year of Publication</b> |
|---------------|---|---|--------------------------------------|----------------------------|
| 01            | Manual for identification of Medical Bacteria | Cowan and Steel                                       | Cambridge University Press           | 1995                       |
| 02            | Introduction to Microbiology                  | John L.Ingraham & Catherine A                         | Ingraham. Book/Cole Thomson Learning | 2000                       |
| 03            | Fundamentals of Microbiology                  | Edward Alcamo I                                       | Jones and Barlett Publishers         | 2001                       |
| 04            | Biology of Microorganisms                     | Brock   | Prentice Hall, Pearson education     | 2000                       |
| 05            | Microbial Physiology                          | Albert G. Moat, John W. Foster and Michael P. Spector | John Wiley & Sons                    | 2002                       |
| 06            | Biochemical Engineering Fundamentals          | Bailey and Ollis                                      | McGraw Hill                          | 1986                       |
| 07            | Microbiology                                  | Prescott,Lansing M,Harley,John P,Klein, Donald A      | Mc Graw –Hill                        | 2005                       |

**WEB SOURCES:**

<http://gsbs.utmb.edu/microbook/toc.htm>

<http://www.sci-eng.mmu.ac.uk/biology/useful/27.htm>.

[http://www.microbes.info/resources/general\\_Microbiology/](http://www.microbes.info/resources/general_Microbiology/)

[www.microbiologyplace.com](http://www.microbiologyplace.com)

<http://www.med.umich.edu/tamc/links.html>

**SYLLABUS DESIGNER:**

3. Mrs. A. Barathi Assistant Professor
4. Dr. A.Vidhya HOD & Assistant Professor

**CORE – II****IMMUNOLOGY**

| Semester | Subject code | Category | Lecture   |          | Theory    |            | Practical |          | Credit |
|----------|--------------|----------|-----------|----------|-----------|------------|-----------|----------|--------|
|          |              |          | Total hrs | Hrs/week | Total hrs | Hrs / week | Total hrs | Hrs/week |        |
| I        |              | Core     | 75        | 5        | 75        | 5          | 0         | 0        | 4      |

**COURSE OBJECTIVES**

To enable the students to understand the immunity and immune system

**COURSE OUTCOMES**

On successful completion of the course provides detailed knowledge in immunology and to understand practical skills and its application in therapeutic and diagnostic techniques and research.

| CO Number  | Co Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To categorize the basic components of Immune system                           | K2                      |
| <b>CO2</b> | To expertise the mechanism of T and B cell productivity and activity          | K2                      |
| <b>CO3</b> | To gain insight in the possible antigen antibody reaction and its application | K3                      |
| <b>CO4</b> | To diagnose the different types of autoimmune disease                         | K2                      |

|            |  |    |
|------------|--|----|
| <b>CO5</b> | To execute the concept of vaccines, transplantation and tumor. | K2 |
|------------|--|----|

### Mapping with Programme Outcomes:

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | S          | S          | S          |
| <b>CO2</b> | M          | M          | S          | S          | S          | S          |
| <b>CO3</b> | S          | M          | S          | S          | S          | S          |
| <b>CO4</b> | S          | M          | M          | S          | M          | S          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

**S- Strong; M- Medium; L- Low**

### Unit –I: Introduction to Immunology

**(12 Hrs)**

Types of immunity - innate, acquired, passive, active, functional organization of the immune system – immune organs and cells of the immune system – hematopoiesis, Clonal selection theory, Process of inflammation, Phagocytosis, cell death- necrosis and apoptosis

### Unit –II: Antigen and Antibodies

**(12 Hrs)**

Antigen - types, antigenicity and immunogenicity, Properties and Functions – complement system and activation, Adjuvants, Haptens. Immunoglobulin – discovery, structure, properties and types, Antibody – polyclonal and monoclonal antibodies, MHC, activation of T cell and B cell and antigen processing, presentation, recognition of T and B cell, Cytokine signals – signal transduction and activation, signaling pathway

### UNIT III: Antigen and antibody reactions

**(12 Hrs)**

Antigen – antibody principle and methods agglutination, passive agglutination, blood grouping and typing and precipitation reactions, enzymatic immunoassays – radio immunoassays, complement fixation, immunofluorescence, ELISA and complement fixation test.

### Unit IV: Hypersensitivity and Autoimmunity

**(12 Hrs)**

Hypersensitivity reaction, Autoimmune diseases – organ specific autoimmune diseases – anemia and its types, Good pasture syndrome, Hashimoto thyroiditis Graves disease. Systemic autoimmune disease – Systemic lupus erythematosus and myasthenia gravis, Immune tolerance and suppression

### UNIT V: Vaccines, Tumor and transplant immunology

**(12 Hrs)**



Vaccines and types- live, killed, attenuated, subunit, DNA, recombinant vaccine and toxoids, Immunity to cancer – cancer tolerance & immunology of cancer – Transplantation immunology – Graft versus host reactions

#### **TEACHING METHODOLOGY:**

- ❖ **Lectures**
- ❖ **Power point presentation**
- ❖ **Charts**
- ❖ **Models**
- ❖ **Group discussion**
- ❖ **Group assignments**
- ❖ **Seminars**

#### **TEXT BOOKS**

| <b>S.No</b> | <b>Author</b>                      | <b>Title</b>                      | <b>Publisher</b>                    | <b>Year of Publication</b> |
|-------------|------------------------------------|-----------------------------------|-------------------------------------|----------------------------|
| 1           | D.M. Weir and J Steward            | Immunology                        | ELBS, London.                       | 1993                       |
| 2           | A K Abbas, A H Lichtman, J S Pober | Cellular and molecular Immunology | Ind edition WB saunders, USA        | 1994                       |
| 3           | J H Humphrey, R G White.           | Immunology for students           | 5 <sup>th</sup> edition ELBS London | 1995                       |

#### **REFERENCE BOOKS:**

| <b>S.No</b> | <b>Author</b> | <b>Title</b>         | <b>Publisher</b>                         | <b>Year of Publication</b> |
|-------------|---------------|----------------------|--|----------------------------|
| 1           | J Kuby        | Immunology           | W. H. Freeman and Company, New York      | 2009                       |
| 2           | I.M Riott     | Essential Immunology | Blackwell scientific publication, London | 2011                       |

#### **WEB SOURCES:**

<http://www.immuno.path.cam.ac.uk/~immuno/part1.html>  
<http://www.lclark.edu/~reiness/immuno/lectures.html>  
<http://www.hhmi.org/biointeractive/immunology/lectures.html>  
<http://immuneweb.xxmc.edu.cn/immunology/immunology/html>  
<http://www.cehs.siu.edu/fix/medmicro/index.html>  
<http://www.biotech.ubc.ca/teachingresources/microbiologyimmunology/immunesystemnotes.html>

**SYLLABUS DESIGNER:**

1. Dr.S.Ramya Assistant Professor
2. Dr. A.Vidhya HOD & Assistant Professor

**CORE – III****SYSTEMATIC MEDICAL BACTERIOLOGY**

| Semester | Subject code | Category | Lecture   |           | Theory    |           | Practical |           | Credit |
|----------|--------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|--------|
|          |              |          | Total hrs | Hrs/ week | Total hrs | Hrs/ week | Total hrs | Hrs/ week |        |
| I        |              | Core     | 75        | 5         | 75        | 5         | 0         | 0         | 5      |

**COURSE OBJECTIVES**

To enable the students to understand the bacterial diseases of human beings and animals.

**COURSE OUTCOMES**

On the successful completion of the course students will be able to acquire knowledge about the bacterial pathogens and its diseases

| CO Number  | CO Statement  | Knowledge level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To extrapolate the general and specific mechanisms by which an infectious agent causes disease                | <b>K2</b>               |
| <b>CO2</b> | To compare the microbial pathogenesis, transmission, diagnosis, treatment of respiratory pathogenic organisms | <b>K2</b>               |
| <b>CO3</b> | To compare the microbial pathogenesis, transmission, diagnosis, treatment of intestinal pathogenic organisms  | <b>K2</b>               |
| <b>CO4</b> | To extrapolate the hospital borne infections and infection control programs.                                  | <b>K3</b>               |
| <b>CO5</b> | To analyze the principles of antimicrobial action and how microbes become resistant to them.                  | <b>K3</b>               |

**MAPPING WITH PROGRAMME OUTCOMES:**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | M   | M   | M   |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO2</b> | M | S | S | M | M | M |
| <b>CO3</b> | M | S | M | M | M | M |
| <b>CO4</b> | S | M | M | M | M | M |
| <b>CO5</b> | M | M | M | M | M | M |

**S- Strong; M- Medium; L- Low**

### **Unit – I: Clinical approaches to bacterial infections (12 Hrs)**

Introduction to medical microbiology–Indigenous normal microbial flora of human body - Virulence factors of pathogenic bacteria- Enzymes, Toxins. Immunity to microbial infections Host parasite relationships.

### **Unit – II: Bacterial pathogens and associated diseases part I (12 Hrs)**

Morphology, classification, cultural characteristics, pathogenicity, pathology, laboratory diagnosis, prevention, control and treatment of diseases caused by the following organisms – *Staphylococcus aureus*, *Streptococcus pyogenes*, *Haemophilus influenzae* *Neisseria sps*, *Corynebacterium diphtheriae*, *Clostridium tetani*, *C.botulinum*, *C. perfringenes*, *Bacillus anthracis*

### **Unit –III: Bacterial pathogens and associated diseases part II (12 Hrs)**

*Escherichia coli*, *Salmonella typhi*, *Shigella-dysenteriae*, *S.flexneri*, *Proteus vulgaris*, *Vibrio cholerae*, *Bordetella pertussis*, *Spirochetes-Leptospira*, *Treponema. Rickettsiae*, *Chlamydiae*, *Mycoplasma* and *Ureaplasma* *Mycobacterium tuberculosis* and *Mycobacterium leprae*,

### **Unit –IV: Nosocomial and zoonotic diseases (12 Hrs)**

Zoonotic diseases – *Brucella*, *Borrelia*, *Yersinia pestis*, *Anthrax* - their control. Nosocomial infections – UTI, Respiratory, Iatrogenic infections- Surgical infections. Hospital infection control committee – Functions . Hospital waste disposal – Ethical committee – Regulations

### **Unit –V: Vaccines and Antibiotic Resistance (12 Hrs)**

Vaccination schedule. Applications of recent advancements of microbiology for rapid diagnosis. Principles of drug resistance – MDR and XDR- Methicillin resistant *Staphylococcus aureus* (MRSA) Vancomycin-resistant enterococci (VRE) Multi-resistant Gram-negative bacilli (MRGN). Phage therapy

### **TEACHING METHODOLOGY:**

- ❖ Lectures
- ❖ Power point presentation
- ❖ Charts
- ❖ Models
- ❖ Group discussion

❖ **Group assignments**

❖ **Seminars**

**TEXT BOOKS:**

| S.No | Authours   | Title   | Publishers                           | Year of Publication |
|------|--|---|--------------------------------------|---------------------|
| 1.   | Collee JC, Duguid, JP, Fraser A.C., Marimon B.P. "Mackie and McCartney . | Practical Medical Microbiology                      | Churchill Livingstone                | 1996                |
| 2.   | Patrick Murray, Ken Rosenthal and Michael Pfaller.                       | Medical Microbiology,                               | Elsevier Publications, United States | 2016                |
| 3.   | Monica Cheesbrough   | District Laboratory Practice in Tropical Countries. | Cambridge University Press.          | 2003                |

**REFERENCES BOOKS:**

| S.No | Authours   | Title  | Publishers                                 | Year of Publication |
|------|--|--|--|---------------------|
| 1.   | Topley, Wilsons  | Principles of Bacteriology, Virology and Immunology, | Edward Arnold, London                      | 1995                |
| 2.   | Baron L.J., Peterson L.R. and Finegold S.M                 | Bailey and Scott diagnostic Microbiology             | Mosby Publications                         | 1994                |
| 3.   | Jawetz, E., J. L. Melnic and E. A. Adelberg.               | Review of Medical Microbiology                       | Lange Medical Publishers, New York.        | 2013                |
| 4.   | David Greenwood, Richard C.B., Slark, John Forest Penthere | Medical Microbiology                                 | Tata Mac Grawhill. New Delhi               | 2002                |
| 5.   | Zinsser, Wolfgang, Joklik and David T. Smith               | Microbiology   | Appleton, Century Grafts, New York.        | 1990                |
| 6.   | Cowan and Steel  | Manual for Identification of Medical Bacteria,       | Cambridge University Press, London.        | 1995                |
| 7.   | John G. Holt, Noel R. Krieg, Peter H.H, Sneath, James T.   | Bergy's Manual of Determinative Bacteriology         | Lippincott Williams and Wilkins Publishers | 2000                |

|  |                                |  |  |  |
|--|--------------------------------|--|--|--|
|  | Staley and Stanely T. Williams |  |  |  |
|--|--------------------------------|--|--|--|

#### **WEB SOURCES:**

<http://www.microbeworld.org/>

<http://www.microbes.info/>

<http://www.protocol-online.org/>

<http://www.microbiologyonline.org.uk/>

<http://microbiology.mtsinai.on.ca/manual/default.asp>

#### **SYLLABUS DESIGNER:**

1. Mrs. S. Arunadevi Assistant Professor
2. Dr. A.Vidhya HOD & Assistant Professor
- 3.

#### **PRACTICALS: IMMUNOLOGY AND BACTERIOLOGY**

| Semester | Subject code | Category  | Lecture   |          | Theory    |            | Practical |          | Credit |
|----------|--------------|-----------|-----------|----------|-----------|------------|-----------|----------|--------|
|          |              |           | Total hrs | Hrs/week | Total hrs | Hrs / week | Total hrs | Hrs/week |        |
| I        |              | Practical | 0         | 0        | 0         | 0          | 60        | 4        | 5      |

#### **Immunology**

1. Separation of serum/plasma – blood grouping and typing
2. Differential count- WBC
3. Precipitation tests – ODD and SRID
4. Electrophoresis- Immunoelectrophoresis and CIE
5. Passive agglutination test- ASLO test and Widal slide test
6. Complement fixation test
7. Autoimmune diseases – SLE test
8. ELISA.

#### **Medical Bacteriology**

1. Collection and transport of clinical specimens – sputum, pus, urine, faeces, blood and CSF. Simple, differential -Gram staining, Acid fast staining and specialized staining methods. Capsule staining.
2. Cultivation methods – transport media – Isolation methods – basal, differential, enriched, selective media and for the pathogenic bacteria.
3. Biochemical identification of the pathogenic bacteria – indole, methyl red, voges praskeur, citrate utilisation, TSI, urease, catalase, oxidase, sugar fermentation, coagulase, Nitrate test, Gelatin liquefaction
4. Antibiotic sensitivity test- Kirby Bauer method- MIC– broth dilution, agar dilution method- MBC

### **ELECTIVE– I**

#### **ADVANCES IN MOLECULAR BIOLOGYAND MICROBIAL GENETICS**

| <b>Semester</b> | <b>Subject code</b> | <b>Category</b> | <b>Lecture</b>   |                  | <b>Theory</b>    |                   | <b>Practical</b> |                  | <b>Credit</b> |
|-----------------|---------------------|-----------------|------------------|------------------|------------------|-------------------|------------------|------------------|---------------|
|                 |                     |                 | <b>Total hrs</b> | <b>Hrs/ week</b> | <b>Total hrs</b> | <b>Hrs / week</b> | <b>Total hrs</b> | <b>Hrs/ week</b> |               |
| I               |                     | Elective        | 45               | 3                | 45               | 3                 | 0                | 0                | 3             |

#### **COURSE OBJECTIVES**

To enable the students to understand the Molecular biology and Microbial Genetics

#### **COURSE OUTCOMES**

On the successful completion of the course, students will be able to understand the basics of Molecular biology & Microbial Genetics and acquire a sound knowledge about generating, processing and understanding biological genetic information.

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K1-K4)</b> |
|------------------|---|--------------------------------|
| <b>CO1</b>       | To expertise the transformation experiments and other gene transfer techniques  | <b>K2</b>                      |
| <b>CO2</b>       | To categorize the characteristics and structure of natural and artificial plasmids and transposons used in gene transfer mechanism. | <b>K2</b>                      |
| <b>CO3</b>       | To analyze the mechanism of Gene Regulation & Expression and Gene as a unit of mutation   | <b>K2</b>                      |

|            |  |           |
|------------|--|-----------|
|            | and recombination.   |           |
| <b>CO4</b> | To understand the DNA sequencing, Site-directed mutagenesis and gene mapping of prokaryotes. | <b>K2</b> |
| <b>CO5</b> | To gain knowledge about Epigenetics and transposons  | <b>K2</b> |

#### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | M          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | M          | S          | S          |
| <b>CO4</b> | S          | M          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | M          | S          | S          |

**S- Strong; M- Medium; L- Low**

#### **Unit-I: Genetic material**

**(15 Hrs)**

Nucleic Acids – Definition – Structure, Composition & Properties of Nucleic Acids (DNA & RNA). Transformation: Competence, Preparation of Competent cells, Mechanism of transformation, Conjugation: Hfr, F<sup>+</sup> and F<sup>-</sup> transfer; Transduction: General Transduction, Abortive Transduction and Specialized Transduction.

#### **Unit-II: Plasmids**

**(15 Hrs)**

Plasmids: Introduction, Classification of Plasmids, Isolation and Purification of Plasmids, Characteristics of ideal plasmid vector, Structure of Plasmids F1, Col E1, pSC 101 and Ti Plasmids- Structure of T-DNA, Ti plasmid as an ideal cloning vector, Ti Plasmid derived vectors – Disarmed and Binary vectors.

#### **Unit –III: Regulation of genes**

**(15 Hrs)**

Gene Regulation : Regulation of gene expression – Regulation of Enzymes ( Induction, Repression & Inhibition), Regulation of Transcription (Negative, Positive, Auto & Co-ordinate regulation); Operon Concept – Lac Operon, Tryptopan Operon, Arabinose operon; DNA methylation ; Translational control – Translation regulation, role of AntiSense RNA in Translational control; Post - Translational Modification.

#### **Unit –IV: DNA sequencing**

**(15 Hrs)**

DNA sequence analysis : Maxam – Gilbert (Chemical) sequencing, Sanger – Coulson (dideoxy/enzymatic) sequencing, Automated DNA sequencing, Next generation sequencing. Site-directed mutagenesis.

#### **Unit –V: Epigenetics and Transposons**

**(15 Hrs)**

Epigenetics; Transposable elements - Classes of Transposable elements - Nomenclature of Transposable elements; Insertion sequences (IS elements); Transposons: Composite transposons and complex transposons - Transposition :Mechanism of Transposition.

#### **TEACHING METHODOLOGY:**

- ❖ **Lectures**
- ❖ **Power point presentation**
- ❖ **Charts**
- ❖ **Models**
- ❖ **Group discussion**
- ❖ **Group assignments**
- ❖ **Seminars**

#### **TEXT BOOKS:**

| <b>S.No</b> | <b>Authors</b>   | <b>Title</b>           | <b>Publishers</b>         | <b>Year of Publication</b> |
|-------------|--|------------------------|---------------------------|----------------------------|
| 1.          | Maloy SR, Cronan JR , JE. Friedfelder                            | Microbial Genetics     | Jones & Bartlet           | 1994                       |
| 2           | Lodish H,Baltimore O,Berk A,Zipursky S L,Matsudaira P, Darnell L | Molecular Cell Biology | Scientific American Books | 1995                       |

#### **REFERENCE BOOKS:**

| <b>S.No</b> | <b>Authors</b> | <b>Title</b>                               | <b>Publishers</b>               | <b>Year of Publication</b> |
|-------------|----------------|--|---------------------------------|----------------------------|
| 1.          | William Hayes  | The genetics of bacteria and their viruses | Blackwell Scientific Publishers | 1995                       |
| 2.          | Benjamin Lewin | Genes VIII                                 | Pearson Prentice Hall, USA      | 2004                       |
| 3.          | Innis M.A.     | PCR Strategies                             | Academic press                  |                            |
| 4.          | Brown. T.A     | Essentials of Molecular Biology            | Freeman Publishing House        | 2003                       |

#### **WEB SOURCES:**

<http://www.molgen.mpg.de/>  
<http://www.cellbio.com/>  
<http://restools.sdsc.edu/>



<http://www.mcb.harvard.edu/biolinks.html>  
<http://www.horizonpress.com/gateway>

### **SYLLABUS DESIGNER:**

1. Dr.J. Hemapriya Assistant Professor
2. Dr. A.Vidhya HOD & Assistant Professor

### **SELF STUDY PAPER - I**

### **ORGANIC FARMING**

| <b>Semester</b> | <b>Subject code</b> | <b>Category</b>  | <b>Lecture</b>   |                  | <b>Theory</b>    |                   | <b>Practical</b> |                  | <b>Credit</b> |
|-----------------|---------------------|------------------|------------------|------------------|------------------|-------------------|------------------|------------------|---------------|
|                 |                     |                  | <b>Total hrs</b> | <b>Hrs/ week</b> | <b>Total hrs</b> | <b>Hrs / week</b> | <b>Total hrs</b> | <b>Hrs/ week</b> |               |
| I               |                     | Self study paper | 0                | 0                | 0                | 0                 | 0                | 0                | 2             |

### **UNIT- I**

Scope, Definition and concept of organic farming. Components of organic farming and their role in sustainable crop production. Nutrient management in organic farming – Crop rotation. Integrated intensive Farming system (IIFS).

### **UNIT-II**

Traditional organic farming:- Manures – Bulky organic manures:- Farmyard manure, compost - urban compost, Night-soil. Concentrated organic manures – Oil cakes, Fishmeal. Green manure – Sesbania sps., Crotalaria juncea. Green leaf manure.

### **UNIT-III**

Non-Traditional organic farming:- Bio fertilizers, Rhizobium, Azotobacter, Azospirillum, B.G.A., Azolla, Ecto & Endo Mycorrhiza, VAM – Potash mobilize (Frateuria aurentia)- Liquid biofertilizers - Mass cultivation, Field application, cost effectiveness. Vermi – Compost - Methods. Aquatic weeds.

### **UNIT- IV**

Biogas technology for organic farming – Composition of biogas slurry- Agronomic importance. Waste water treatment method and its uses for organic

farming – Macrophyte treatment. Agricultural waste management- Crop waste – cattle, poultry and pig waste- Farm waste recycling.

#### **UNIT-V**

Pest and disease management in organic farming – Trichogramma sps., NPV, Beauveria bassiana, Metarhizium anisopliae. Weed management – Living mulch, organic mulches and biological weed control. Organic post harvest technologies. Organic farm inputs techniques: Panchagavya and Dasagavya. Organic certification and accreditation process of organic product.

#### **REFERENCE BOOKS:**

1. Subba Rao NS (2004). Soil Microbiology. Fourth edition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Rangaswami G and Bagyaraj DJ (2002). Agricultural Microbiology. Second edition, PHI Learning (P) Ltd., New Delhi.
3. Dahama, A.K. (2002). Organic Farming for sustainable agriculture. Agrobios (India).
4. Arun K. Sharma, (2003). Biofertilizers for Sustainable Agriculture. Agrobios (India).
5. Subba Rao NS (1997). Biofertilizer in Agriculture and Forestry, 3rd edition, Oxford & IBU Publications.
6. Dubey RC (2005). A Text of Biotechnology. Multicolor Illustrative edition, S.Chand and Company Ltd., New Delhi.

#### **WEB SOURCES:**

1. [http://www.agritech.tnau.ac.in/org\\_farm/orgfarm\\_index.html](http://www.agritech.tnau.ac.in/org_farm/orgfarm_index.html)

#### **SYLLABUS DESIGNER:**

1. Dr. A.Vidhya HOD & Assistant Professor

**CORE- IV**  
**VIROLOGY**

| Semester  | Subject code | Category | Lecture   |           | Theory    |            | Practical |           | Credit |
|-----------|--------------|----------|-----------|-----------|-----------|------------|-----------|-----------|--------|
|           |              |          | Total hrs | Hrs/ week | Total hrs | Hrs / week | Total hrs | Hrs/ week |        |
| <b>II</b> |              | Core     | 75        | 5         | 75        | 5          | 0         | 0         | 5      |

**COURSE OBJECTIVES**

To enable the students to understand the Viral diseases of human beings and plants.

**COURSE OUTCOMES**

On the successful completion of the course, students will be able to understand the virus that cause infections to animals and plants and how it should be prevented and control by using vaccines and antiviral agents.

| CO Number  | CO Statement   | Knowledge Level<br>(K1 – K4) |
|------------|--|------------------------------|
| <b>CO1</b> | To expertise how the viruses are classified and about the sub viral particles            | <b>K2</b>                    |
| <b>CO2</b> | To categorize the viruses infecting microorganisms and insects                           | <b>K2</b>                    |
| <b>CO3</b> | To categorize the various plant viruses that infect plants and its mode of transmission. | <b>K2</b>                    |
| <b>CO4</b> | To compare the pathogenesis of animal DNA viruses and how it infects human.              | <b>K4</b>                    |
| <b>CO5</b> | To expertise the emerging viral infections and about the oncogenic viruses.              | <b>K2</b>                    |

**MAPPING WITH PROGRAMME OUTCOMES:**

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | S   | M   | S   | S   |
| <b>CO2</b> | S   | M   | S   | S   | S   | M   |
| <b>CO3</b> | S   | S   | M   | M   | S   | M   |
| <b>CO4</b> | S   | S   | S   | M   | S   | S   |
| <b>CO5</b> | S   | M   | S   | S   | S   | S   |

**S- Strong; M- Medium; L- Low**

**UNIT- I: General properties of viruses****(12 Hrs)**

History of virology; classification of viruses based on their hosts, nucleic acids and structures. Viroids, prions and virusoids. Viral replication and cultivation. General methods of diagnosis and serology for viruses. Viral vaccines, interferons and anti viral drugs.

**UNIT-II: Viruses infecting microorganisms and insects****(12 Hrs)**

Structure, composition and life cycle of viruses infecting cyanobacteria, algae, fungi, bacteria (Bacteriophages -  $\Phi$ X174, M13, Mu, T4, Lambda, p1) and insects.

**UNIT- III: Plant viruses****(12 Hrs)**

Plant viruses – General characteristics - Morphology – replication- RNA as its initiators of infection – TMV, CMV; Transmission of plant viruses; Common viral diseases of crop plants – paddy, cotton, tomato and sugarcane.

**UNIT – IV: Animal viruses part I****(12 Hrs)**

Animal viruses – Life cycle, pathogenicity, diagnosis, prophylaxis and prognosis of DNA viruses – Parvo, Herpes - HSV, CMV, Varicella zoster, EBV, Adeno and Hepatitis.

**UNIT –V: Animal viruses part II****(12 Hrs)**

Animal viruses – Life cycle, pathogenicity, diagnosis, prevention and treatment of RNA viruses; picorno, orthomyxo (H1NI), paramyxo – mumps, measles and rubella and other arbo viruses – chikngunya virus, yellow fever, dengue. Rhabdo, Rota, Ebola, HIV. Oncogenic viruses – Human papova virus, Leucosis sarcoma and HTLV.

**TEACHING METHODOLOGY:**

- ❖ Lectures
- ❖ Power point presentation
- ❖ Charts
- ❖ Models
- ❖ Group discussion
- ❖ Group assignments
- ❖ Seminars

**TEXT BOOKS:**

| S.No | Authors                                       | Title                           | Publishers                          | Year Of Publication |
|------|---|---------------------------------|-------------------------------------|---------------------|
| 1.   | David Greenwood, Richard C. B.,               | “Medical Microbiology.”         | ELBS with Churchill Livingstone     | 1992                |
| 2.   | Jawetz, E., J. L. Melnick and E. A. Adelberg. | Review of Medical Microbiology, | Lange Medical Publishers, New York. | 2013.               |
| 3.   | Ananthanarayanan R. and Jayaram Panicker C.K. | “Text book of Microbiology”.    | Orient Longman                      | 2017                |

**REFERENCE BOOKS:**

| S.No | Authors  | Title  | Publishers                    | Year Of Publication |
|------|--|--|-------------------------------|---------------------|
| 1.   | Balows A., Hausner W.J, Ohari M., and Turano A | Laboratory diagnosis of infectious diseases. Principles and Practice (Vol 1) | Springer – Vertag, New York   | 1998                |
| 2.   | Morag C & Timbury M C                          | Medical Virology   | Churchill Livingstone, London | 1994                |
| 3.   | Calender R                                     | Bacteriophages I, II, III  | Plenum Press                  | 1998                |

**WEB SOURCES:**

<http://web.uct.ac.za/depts/mmj/jmoodie/welcome1.html>  
<http://vm.cfsan.fda.gov/~mow/intro.html>  
<http://medicine.wustl.edu/virology/>  
<http://www.virology.net/garryfavwebaids.html>

**SYLLABUS DESIGNER:**

3. Mrs. R.Sangeetha Assistant Professor
4. Dr. A.Vidhya HOD & Assistant Professor

**CORE – V****GENETIC ENGINEERING**

| Semester | Subject code | Category | Lecture   |           | Theory    |            | Practical |           | Credit |
|----------|--------------|----------|-----------|-----------|-----------|------------|-----------|-----------|--------|
|          |              |          | Total hrs | Hrs/ week | Total hrs | Hrs / week | Total hrs | Hrs/ week |        |
| II       |              | Core     | 60        | 4         | 60        | 4          | 0         | 0         | 4      |

**COURSE OBJECTIVES:**

To enable the students to understand the aspects of Genetic Engineering.

**COURSE OUTCOMES:**

On successful completion of the course students should gained a sound knowledge on the tools, vectors, mechanism and application of genetic engineering

| CO Number  | Co Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To execute the molecular tools required for genetic engineering                                 | <b>K2</b>               |
| <b>CO2</b> | To gain insight in the types of cloning vehicles involved in cloning                            | <b>K2</b>               |
| <b>CO3</b> | To impart knowledge on the mechanism of cloning strategies and gene libraries                   | <b>K2</b>               |
| <b>CO4</b> | To execute the different techniques involved in screening and identification of positive clones | <b>K3</b>               |
| <b>CO5</b> | To elucidate the output and application of cloned vector for social benefit                     | <b>K2</b>               |

**MAPPING WITH PROGRAMME OUTCOMES:**

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | S   | M   | S   | M   | S   |
| <b>CO2</b> | S   | S   | M   | S   | S   | S   |
| <b>CO3</b> | S   | S   | S   | M   | S   | S   |
| <b>CO4</b> | S   | S   | S   | S   | S   | S   |
| <b>CO5</b> | S   | S   | S   | M   | S   | S   |

**S- Strong; M- Medium; L- Low**

### **UNIT- I: Nucleic acid modifying enzymes**

**(9 Hrs)**

Restriction enzymes – nomenclature – classification- restriction and methylation – Type II restriction endonuclease – uses of restriction endonucleases – Restriction mapping and its application. Nucleases, polymerases – Taq polymerase, reverse transcriptase, DNA ligases, alkaline phosphatase, terminal transferase and polynucleotide kinases.

### **UNIT – II: Cloning vehicles**

**(9 Hrs)**

Biology of genetic engineering – Prokaryotic and Eukaryotic hosts – E. coli and Yeasts. Plasmids vectors – pBR322 construction, pUC and pSC 101, Vectors based on Bacteriophage – lambda and M-13 phage vector, cosmids, shuttle vectors, phagemids, *in vitro* packaging of Bacteriophage DNA. Expression vectors, screening of recombinants- antibiotic resistance and LacZ. Alternative DNA delivery synthesis – artificial chromosomes – BAC, YAC and HAC.

### **UNIT – III: Cloning strategies and Gene libraries**

**(9 Hrs)**

Cloning from mRNA – Synthesis of cDNA – Cloning cDNA in plasmid and Bacteriophage vectors. Cloning from genomic DNA. Genomic libraries, preparations of DNA fragments for cloning ligation, packaging and amplification of libraries. Genetic selection and screening methods.

### **UNIT IV: Techniques in genetic engineering**

**(9 Hrs)**

Gene Analysis Techniques- Isolation of DNA and RNA from microbes – Handling and quantification of nucleic acids- Radio labeling of nucleic acids – End labeling- Nick translation – Labelling by primer extension. Pulse Field Gel Electrophoresis- modifications and applications. Nucleic acid hybridization – Southern, Northern, Western, South-Western and Dot-slot blotting. PCR.

### **UNIT V: Application of r DNA technology**

**(9 Hrs)**

Application of r DNA technology – Human protein replacements – insulin, Human growth hormone, therapeutic agents for human diseases, TPA, interferons, recombinant vaccines

### **TEACHING METHODOLOGY:**

- ❖ **Lectures**
- ❖ **Power point presentation**
- ❖ **Charts**
- ❖ **Models**
- ❖ **Group discussion**
- ❖ **Group assignments**
- ❖ **Seminars**

**TEXT BOOKS:**

| S.No | Authors  | Title                  | Publishers                | Year of Publication |
|------|--|------------------------|---------------------------|---------------------|
| 1.   | Maloy SR, Cronan JR , JE. Friedfelder                            | Microbial Genetics     | Jones & Bartlet           | 1994                |
| 2    | Lodish H,Baltimore O,Berk A,Zipursky S L,Matsudaira P, Darnell L | Molecular Cell Biology | Scientific American Books | 1995                |

**REFERENCE BOOKS:**

| S.No | Authors               | Title                                      | Publishers                      | Year of Publication |
|------|-----------------------|--|---------------------------------|---------------------|
| 1.   | Lodish,Berk,Zippursky | Molecular cell biology                     | W.H.Freeman                     |                     |
| 2.   | William Hayes         | The genetics of bacteria and their viruses | Blackwell Scientific Publishers | 1995                |
| 3.   | Benjamin Lewin        | Genes VIII                                 | Pearson Prentice Hall, USA      | 2004                |
| 4.   | Innis M.A.            | PCR Strategies                             | Academic press                  |                     |
| 5.   | Brown. T.A            | Essentials of Molecular Biology            | Freeman Publishing House        | 2003                |

**WEB SOURCES:**

<http://biotech.icmb.utexas.edu/pages/scitools.html>  
<http://biotech.icmb.utexas.edu/pages/resources.html>  
<http://4biotech.4anything.com/>  
<http://bio.com/resedu/educate.html>  
<http://www.accessexcellence.org/>

**SYLLABUS DESIGNER:**

1. Dr.S. Ramya Assistant Professor
2. Dr. A.Vidhya HOD & Assistant Professor



## PRACTICALS: VIROLOGY AND GENETIC ENGINEERING

| Semester | Subject code | Category  | Lecture   |           | Theory    |            | Practical |           | Credit |
|----------|--------------|-----------|-----------|-----------|-----------|------------|-----------|-----------|--------|
|          |              |           | Total hrs | Hrs/ week | Total hrs | Hrs / week | Total hrs | Hrs/ week |        |
| I        |              | Practical | 0         | 0         | 0         | 0          | 60        | 4         | 5      |

### Genetic Engineering

1. Estimation of DNA by Diphenyl amine method
2. Estimation of RNA by Orcinol method
3. Isolation and quantification of genomic DNA
4. Isolation and quantification of plasmid DNA
5. Restriction digestion - single or double digestion of given nucleic acid.
6. Ligation technique.
7. Blue white screening technique
8. Gradient plate technique
9. Western blotting
10. PCR (DEMO)

### Medical Virology

1. Isolation and characterization of Bacteriophage from Natural resources – 2. Phage titration – T4 or Lambda or M13 – Determination of lysogeny using lambda phage or Staphylococcal indicator systems.
3. Staining of some viral inclusion bodies such as, (i) Rabies – Negri bodies, (ii) CPE stained smears.
4. Viral cultivation methods (i) Egg inoculation (ii) Animal tissue culture (Demo) (iii) Chick embryo fibroblast culture (Demo)
5. Serological tests – Haemagglutination and, Haemagglutination inhibition tests, study of virus infected plant samples

**CORE – VI****FOOD, DAIRY AND ENVIRONMENTAL MICROBIOLOGY**

| Semester | Subject code | Category | Lecture   |           | Theory    |           | Practical |           | Credit |
|----------|--------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|--------|
|          |              |          | Total hrs | Hrs/ week | Total hrs | Hrs/ week | Total hrs | Hrs/ week |        |
| II       |              | Core     | 60        | 4         | 60        | 4         | 0         | 0         | 5      |

**COURSE OBJECTIVES**

To enable the students to understand the basics of Food, Dairy & Environmental Microbiology

**COURSE OUTCOMES**

On successful completion of the course students will be able to understand preservation methods, fermented foods and pollution control.

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | To analyze the ways to control microorganisms in foods and thus know the principles involving various methods of food preservation                         | K2                      |
| CO2       | To analyze the beneficial role of microorganisms in fermented foods and in food processing and the microbiology of different types of fermented products.  | K2                      |
| CO3       | To categorize the microorganisms responsible for water-borne pathogenic microorganisms and their transmission and can assess the quality of drinking water | K2                      |
| CO4       | To expertise the various biogeochemical cycles, plant microbes interactions especially rhizosphere, phyllosphere and mycorrhizae and their applications    | K2                      |
| CO5       | To apply the principles to solve the environmental problems –bioremediation  | K3                      |

**Mapping with Programme Outcomes:**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | M   | S   | S   |
| CO2 | S   | S   | M   | M   | S   | S   |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO3</b> | S | S | S | M | S | S |
| <b>CO4</b> | S | S | M | S | S | S |
| <b>CO5</b> | S | S | M | M | S | S |

**S- Strong; M- Medium; L- Low**

### **UNIT –I: Food Microbiology**

**(15 Hrs)**

Food Microbiology; sources of microbial contamination in foods; Factors influencing microbial growth in foods; Extrinsic and intrinsic; Principles and methods of food preservation; High temperature, Low temperature, Drying, Irradiation and Chemical preservatives; Food borne diseases.

### **UNIT- II: Dairy Microbiology**

**(15 Hrs)**

Dairy Microbiology; Microflora of milk; Source of contamination, Preservation and Spoilage of milk and milk products, Milk borne diseases, Fermented foods – yoghurt, cheese. Prebiotics and Probiotics; Food sanitation, Food control agencies and their regulation.

### **UNIT- III: Environmental Microbiology**

**(15 Hrs)**

Microbiology of air: Droplet and droplet nuclei, Assessment of air quality, Air sanitation; Air borne diseases; Microbiology of water: Water borne diseases, water purification and portability. Waste water treatment- type – characterization. Treatment of solid waste.

### **UNIT- IV: Microbiology of soil and Interactions**

**(15 Hrs)**

Characteristics and classification of soils; Soil microorganisms ; Interaction between microorganisms- Lichens. Interaction of microbes with plants – rhizosphere, phyllosphere, Mycorrhizae. Interaction of microbes with plants- Ruminants, Insects. Biogeochemical cycles- carbon, nitrogen, phosphorus, oxygen. Biofertilizers- Rhizobium, Azotobacter, Azospirillum, Phosphate solubilizers, algal biofertilizers. Biopesticides – Bacillus thuringensis, Beauveria bassiana, viral biopesticide.

### **UNIT- V: Bioremediation**

**(15 Hrs)**

Degradation of xenobiotic compounds. Biodeterioration of materials by microbes – paper, wood, leather, paint. Metal corrosion, bioaccumulation of heavy metals, bioflocculation, biofouling, bioleaching, biofilms.

### **TEACHING METHODOLOGY:**

- ❖ **Lectures**
- ❖ **Power point presentation**
- ❖ **Charts**
- ❖ **Models**

- ❖ **Group discussion**
- ❖ **Group assignments**
- ❖ **Seminars**

#### **TEXT BOOKS:**

| <b>S.no</b> | <b>Authors</b>                         | <b>Title</b>                         | <b>Publishers</b>                                    | <b>Year of publication</b> |
|-------------|--|--------------------------------------|--|----------------------------|
| 1           | Frazier WC and Westhoff DC             | Food Microbiology.                   | Tata McGraw Hill Publishing Company LTD . New Delhi. | 2013                       |
| 2           | Adams M.R and MO                       | Food Microbiology.                   | The Royal Society of Cambridge.                      | 2008                       |
| 3           | EC Eldowrley S,Hardman OJ and Waite S. | Pollution :Ecology and Biotreatment. | Longman Scientific Technical.                        | 1993                       |
| 4           | Baker KH and Herson OS.                | Bioremediation                       | McGraw Hill , Inc. New York.                         | 1994                       |

#### **REFERENCE BOOKS:**

| <b>S.no</b> | <b>Authors</b>                           | <b>Title</b>                           | <b>Publishers</b>                          | <b>Year of publication</b> |
|-------------|--|--|--|----------------------------|
| 1           | Robinson RK                              | Dairy Microbiology,                    | John Wiley and Sons, Inc., United Kingdom. | 2002                       |
| 2           | Banwart G.J.                             | Basic Food Microbiology.               | Chapman & Hall ,New York.                  | 1989                       |
| 3           | Stanbury. P.F, A. Whittakker & S.J. Hall | Principals of fermentation technology. | Pergmon Press.                             | 2005                       |
| 4           | Baker KH and Herson OS.                  | Bioremediation                         | McGraw Hill , Inc. New York.               | 1994                       |

#### **WEB SOURCES**

<http://www.fsis.usda.gov/>  
<http://www.microbes.info/>  
<http://www.epa.gov/nerlcwww/>

#### **SYLLABUS DESIGNER:**

1. Dr. A.Vidhya HOD & Assistant Professor

## PRACTICALS: GENERAL AND APPLIED MICROBIOLOGY

| Semester | Subject code | Category  | Lecture   |           | Theory    |            | Practical |           | Credit |
|----------|--------------|-----------|-----------|-----------|-----------|------------|-----------|-----------|--------|
|          |              |           | Total hrs | Hrs/ week | Total hrs | Hrs / week | Total hrs | Hrs/ week |        |
| I        |              | Practical | 0         | 0         | 0         | 0          | 60        | 4         | 5      |

### General Microbiology

1. Handling and maintenance of light microscopy, dark field and phase contrast microscopy.
2. Wet mount of Hay Infusion broth.
3. Micrometry.
4. Motility determination – Hanging drop method.
5. Staining – Simple, Gram, Acid fast, Spore, Capsule, Flagellar staining.
6. Sterilization – Principles, methods – moist heat, dry heat, filtration.
7. Pure Culture techniques – Streak plate, Pour plate and Spread plate.
8. Media preparation – Liquid, Solid, Agar deep, & Slants.
9. Anaerobic Cultivation - Anaerobic jar (Total anaerobes).
10. Antibiotic sensitivity test – Kirby Bauer & MIC.
11. Fermentation of carbohydrates and submerged fermentation.
12. Growth and Growth requirements – bacterial growth curve – turbidimetry. Direct count, viable count.

### Applied Microbiology

1. Microbiological analysis of food products – bacterial, fungal. Direct bacterial count from milk. Standard plate count in milk.
2. Reduction test for milk – Methylene blue/ Resazurin.
3. Enumeration of microorganisms from soil and air.

4.Isolation of Azotobacter, Rhizobium, Phosphate solubilizers, ammonifiers, denitrifiers.

5.Extracellular enzyme activity- cellulase, protease, lipase and phosphatase.

6.MPN technique

7.Estimation of BOD and COD.

8.Field trip.

### **ELECTIVE – II**

#### **BIOLOGICAL TECHNIQUES**

| <b>Semester</b> | <b>Subject code</b> | <b>Category</b> | <b>Lecture</b>   |                  | <b>Theory</b>    |                   | <b>Practical</b> |                  | <b>Credit</b> |
|-----------------|---------------------|-----------------|------------------|------------------|------------------|-------------------|------------------|------------------|---------------|
|                 |                     |                 | <b>Total hrs</b> | <b>Hrs/ week</b> | <b>Total hrs</b> | <b>Hrs / week</b> | <b>Total hrs</b> | <b>Hrs/ week</b> |               |
| II              |                     | Elective        | 45               | 3                | 45               | 3                 | 0                | 0                | 3             |

#### **COURSE OBJECTIVES**

To enable the students to understand the basic biological techniques.

#### **COURSE OUTCOMES**

On the successful completion of the course, students will be able to understand the basic principles and applications of the techniques used in the laboratory and the analytical techniques in the field of microbiology.

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level<br/>K1 – K4)</b> |
|------------------|---|-------------------------------------|
| <b>CO1</b>       | To identify the basics of analytical techniques   | <b>K2</b>                           |
| <b>CO2</b>       | To understand the principle and analysis of different components of various mixtures by chromatographic technique     | <b>K2</b>                           |
| <b>CO3</b>       | To compute how the molecules are separated by charging (positive and negative electrode)                              | <b>K2</b>                           |
| <b>CO4</b>       | To experiment the sedimentation of particles depends upon the density of both sample and solution and its application | <b>K1</b>                           |

|            |  |           |
|------------|--|-----------|
| <b>CO5</b> | To execute the extensive use of radio isotopes in diagnosis and therapy of living matter | <b>K3</b> |
|------------|--|-----------|

### Mapping with Programme Outcomes:

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | M          | S          | S          | S          | S          |
| <b>CO2</b> | S          | M          | M          | S          | S          | M          |
| <b>CO3</b> | S          | S          | M          | S          | S          | S          |
| <b>CO4</b> | M          | M          | M          | S          | S          | S          |
| <b>CO5</b> | S          | M          | S          | S          | S          | S          |

**S- Strong; M- Medium; L- Low**

### **UNIT-I: Basics of analytical techniques (15 Hrs)**

Normality, molarity, molality, dissolution. pH, buffer – composition of buffer, buffer preparation- Tris –HCl, phosphate buffer.

### **UNIT-II: Chromatographic Techniques (15 Hrs)**

Principles & Applications of Chromatographic Techniques: Adsorption - Ion exchange and gel permeation - Affinity chromatography for separation of compounds including GC and HPLC.

### **UNIT-III: Electrophoresis and detection techniques (15 Hrs)**

Electrophoresis Techniques - Agarose gel electrophoresis, SDS- PAGE, Iso electric focusing. Flow cytometry, FISH, GISH. Microarray and biosensors.

### **UNIT-IV: Centrifugation and Spectroscopy (15 Hrs)**

Centrifugation - Principles, various types including centrifugation. Types of centrifuge, types of rotors. Applications of centrifuge. Spectroscopy – Definition, Principle (Beer - Lambert law) and methods- UV-Visible, Atomic Absorption Spectroscopy, Atomic Emission Spectroscopy, NMR, Fluorimetry.

### **UNIT-V: Radioisotope techniques (15 Hrs)**

Principles of radioactivity. Detection and measurement of different types of radioisotopes normally used in biology, incorporation of radioisotopes in biological tissues and cells, molecular imaging of radioactive material. Safety guidelines.

### **TEACHING METHODOLOGY:**

- ❖ **Lectures**
- ❖ **Power point presentation**
- ❖ **Charts**

- ❖ **Models**
- ❖ **Group discussion**
- ❖ **Group assignments**
- ❖ **Seminars**

**TEXT BOOKS:**

| S.No | Authors         | Title                       | Publishers                                       | Year Of Publication |
|------|-----------------|-----------------------------|--|---------------------|
| 1.   | Arumugam.       | Biomedical Instrumentation, | Anuratha Agencies Publishers                     | 2002.               |
| 2.   | John G. Webster | Bioinstrumentation          | University of Wisconsin, John Wiley & Sons, Inc. | 2004                |
| 3.   | Asokan, P       | Analytical Biochemistry     | Chinnana Publications, India.                    | 2001                |

**REFERENCE BOOKS:**

| S.No | Authors                       | Title   | Publishers                        | Year Of Publication |
|------|-------------------------------|---|-----------------------------------|---------------------|
| 1.   | Chatwal, G. R and S. K. Anand | Instrumental Methods of Chemical Analysis                       | Himalaya Publishing House, Mumbai | 2003                |
| 2.   | Mandeep Singh                 | Introduction to Biomedical Instrumentation                      | Paperback publishers, India       | 2014                |
| 3.   | Wilson, K. and J. Walker      | Principles and Techniques of Biochemistry and Molecular Biology | Cambridge University Press, UK    | 2010                |

**SYLLABUS DESIGNER:**

- 1.Ms. R.Sangeetha, Assistant Professor
- 2.Dr. A.Vidhya, HOD & Assistant Professor



## **DEPARTMENT OF FOODS AND NUTRITION-UG**

### **UG – NUTRITION, FOOD SERVICE MANAGEMENT AND DIETETICS-CBCS**

#### **PROGRAM EDUCATIONAL OBJECTIVES (PEO):**

**PEO 1:** To introduce the students to the fundamentals of Nutrition, food and health

**PEO 2:** To familiarize them with importance of nutrition during various stages of life.

#### **PROGRAM OUTCOMES (PO):**

**PO 1:** To impart knowledge regarding etiology and management of nutritional disorders ranging from nutritional deficiencies to life style disorders.

**PO 2:** To emphasize on the importance of food safety, food quality, food laws and regulations, ongoing national programmes as well as imparting entrepreneurship skill for job enhancement.

**PO 3:** To impart knowledge and develop capacities of the students in the area of Clinical Nutrition.

**PO 4:** To impart knowledge and develop capacities of the students through state of the art higher education in the area of Medical Nutrition Management

**PO 5:** To gain knowledge of principles of various techniques used in the prevention and control of the microorganisms in foods

**PO 6:** To learn basic statistical procedures for Nutritional research.

### **UG – NUTRITION, FOOD SERVICE MANAGEMENT AND DIETETICS-CBCS Pattern**

#### **The Course of Study and the Scheme of Examination**

#### **SEMESTER I**

| S. No | Part | Subject               |             | Hrs /week | Credit    | Title of the Paper         | Maximum marks 100 |           |            |
|-------|------|-----------------------|-------------|-----------|-----------|----------------------------|-------------------|-----------|------------|
|       |      | Course title          |             |           |           |                            | CI A              | Uni. exam | Total      |
| 1     | I    | Language              | Paper I     | 6         | 4         | Tamil                      | 25                | 75        | 100        |
| 2     | II   | English               | Paper I     | 6         | 4         | English                    | 25                | 75        | 100        |
| 3     | III  | Core                  | Paper I     | 6         | 4         | Food Science - I           | 25                | 75        | 100        |
|       |      | Core                  | Practical I | 3         | 0         | Food Science practical - I | -                 | -         | -          |
| 4     | III  | Allied                | Paper I     | 4         | 4         | Chemistry - I              | 25                | 75        | 100        |
|       | III  | Allied                | Practical I | 3         | 0         | Chemistry - I              | -                 | -         | -          |
| 5     | IV   | Environmental science |             | 2         | 2         | Environmental Science      | 25                | 75        | 100        |
|       |      | <b>SUB TOTAL</b>      |             | <b>30</b> | <b>18</b> |                            |                   |           | <b>500</b> |

## SEMESTER II

| S. No | Part | Study components |              | Hrs /week | Credit    | Title of the Paper            | Maximum marks 100 |           |            |
|-------|------|------------------|--------------|-----------|-----------|-------------------------------|-------------------|-----------|------------|
|       |      | Course title     |              |           |           |                               | CIA               | Uni.e xam | Total      |
| 1     | I    | Language         | Paper II     | 6         | 4         | Tamil                         | 25                | 75        | 100        |
| 2     | II   | English          | Paper II     | 4         | 4         | English                       | 25                | 75        | 100        |
| 3     | III  | Core             | Paper II     | 5         | 4         | Food Science - II             | 25                | 75        | 100        |
|       |      | Core             | Practical I  | 3         | 3         | Food science I&II Practical's | 40                | 60        | 100        |
| 4     | III  | Allied           | Paper II     | 4         | 4         | Chemistry - II                | 25                | 75        | 100        |
|       | III  | Allied           | Practical II | 3         | 2         | Chemistry - II                | 40                | 60        | 100        |
| 5     | VI   | Value Education  |              | 3         | 2         | Value Education               | -                 | 50        | 50         |
| 6     | VIII | Soft Skill       |              | 2         | 1         | Soft Skill                    | -                 | 50        | 50         |
|       |      | <b>SUB TOTAL</b> |              | <b>30</b> | <b>24</b> |                               |                   |           | <b>700</b> |

## SEMESTER III

| S. No | Part | Study components |              | Hrs /week | Credit | Title of the Paper          | Maximum marks 100 |           |       |
|-------|------|------------------|--------------|-----------|--------|-----------------------------|-------------------|-----------|-------|
|       |      | Course title     |              |           |        |                             | CIA               | Uni.e xam | Total |
| 1     | I    | Language         | Paper III    | 6         | 4      | Tamil                       | 25                | 75        | 100   |
| 2     | II   | English          | Paper III    | 6         | 4      | English                     | 25                | 75        | 100   |
| 3     | III  | Core             | Paper III    | 4         | 4      | Human Physiology            | 25                | 75        | 100   |
|       |      | Core             | Practical II | 3         | 0      | Human Physiology Practical  | -                 | -         | -     |
| 4     | III  | Allied           | Paper III    | 4         | 3      | Food Microbiology           | 25                | 75        | 100   |
|       | III  | Allied           | Practical II | 3         | 2      | Food Microbiology Practical | 40                | 60        | 100   |

|   |    |                  |  |           |           |                                 |   |    |            |
|---|----|------------------|--|-----------|-----------|---------------------------------|---|----|------------|
| 5 | IV | Skill based      |  | 2         | 2         | Housing and Interior Decoration | - | 50 | 50         |
| 6 | IV | Non major        |  | 2         | 2         | Home Scale Food Preservation    | - | 50 | 50         |
|   |    | <b>SUB TOTAL</b> |  | <b>30</b> | <b>21</b> |                                 |   |    | <b>600</b> |

#### SEMESTER IV

| S. No | Part | Study components |               | Hrs /week | Credit    | Title of the Paper                                    | Maximum marks 100 |           |            |
|-------|------|------------------|---------------|-----------|-----------|---|-------------------|-----------|------------|
|       |      | Course title     |               |           |           |   | CIA               | Uni.ex am | Total      |
| 1     | I    | Language         | Paper IV      | 6         | 4         | Tamil   | 25                | 75        | 100        |
| 2     | II   | English          | Paper IV      | 6         | 4         | English   | 25                | 75        | 100        |
| 3     | III  | Core             | Paper IV      | 4         | 4         | Nutrition Through Life Span                           | 25                | 75        | 100        |
|       | III  | Core             | Practical II  | 3         | 3         | Human Physiology&Nutrition Through Life SpanPractical | 40                | 60        | 100        |
| 4     | III  | Allied           | Paper IV      | 4         | 3         | Biochemistry  | 25                | 75        | 100        |
|       | III  | Allied           | Practical III | 3         | 2         | Biochemistry Practical                                | 40                | 60        | 100        |
| 5     | IV   | Skill based      |               | 2         | 2         | Post Harvest Technology                               | -                 | 50        | 50         |
| 6     | IV   | Non major        |               | 2         | 2         | Health and Fitness                                    | -                 | 50        | 50         |
|       |      | <b>SUB TOTAL</b> |               | <b>30</b> | <b>24</b> |   |                   |           | <b>700</b> |

#### SEMESTER V

| S. No | Part | Study components |          | Hrs /week | Credit | Title of the Paper            | Maximum marks 100 |           |       |
|-------|------|------------------|----------|-----------|--------|-------------------------------|-------------------|-----------|-------|
|       |      | Course title     |          |           |        |                               | CIA               | Uni.ex am | Total |
| 1     | III  | Core             | Paper V  | 6         | 5      | Dietetics –I                  | 25                | 75        | 100   |
| 2     | III  | Core             | Paper VI | 6         | 5      | Principles of Human nutrition | 25                | 75        | 100   |

|   |     |             |                  |           |           |   |    |    |            |
|---|-----|-------------|------------------|-----------|-----------|---|----|----|------------|
| 3 | III | Core        | Practical III    | 5         | 3         | Dietetics Practical-I                   | 40 | 60 | 100        |
| 4 | III | Core        | Practical IV     | 5         | 3         | Principles of Human nutrition practical | 40 | 60 | 100        |
| 5 | III | Elective I  |                  | 3         | 3         | Food Adulteration and Toxicology        | 25 | 75 | 100        |
| 6 | III | Elective II |                  | 3         | 3         | Human Development                       | 25 | 75 | 100        |
| 7 | IV  | Skill Based |                  | 2         | 2         | Basics of Research in Nutrition         | -  | 50 | 50         |
|   |     |             | <b>SUB TOTAL</b> | <b>30</b> | <b>24</b> |   |    |    | <b>650</b> |

#### SEMESTER VI

| S. No | Part | Study components |                    | Hrs /week | Credit | Title of the Paper                          | Maximum marks 100 |           |            |
|-------|------|------------------|--------------------|-----------|--------|---|-------------------|-----------|------------|
|       |      | Course title     |                    |           |        |   | CIA               | Uni.ex am | Total      |
| 1     | III  | Core             | Paper VII          | 5         | 5      | Community Nutrition and Extension Education | 25                | 75        | 100        |
| 2     | III  | Core             | Paper VIII         | 6         | 5      | Dietetics – II                              | 25                | 75        | 100        |
| 3     | III  | Core             | Paper IX           | 5         | 5      | Food Service Management                     | 25                | 75        | 100        |
| 4     | III  | Core             | Practical V        | 4         | 3      | Dietetics Practical-II                      | 40                | 60        | 100        |
| 5     | III  |                  | Elective III       | 4         | 3      | Textile and Clothing                        | 25                | 75        | 100        |
| 6     | III  |                  | Elective IV        | 4         | 3      | Nutraceuticals and Nutrigenomics            | 25                | 75        | 100        |
| 7     | IV   |                  | Skill Based        | 2         | 2      | Entrepreneurship Development                | -                 | 50        | 50         |
|       |      |                  | Extension Activity | -         | 3      |   |                   |           | <b>100</b> |

|  |  |  |                      |            |            |  |  |  |             |
|--|--|--|----------------------|------------|------------|--|--|--|-------------|
|  |  |  | <b>SUB<br/>TOTAL</b> | <b>30</b>  | <b>26</b>  |  |  |  | <b>650</b>  |
|  |  |  | <b>TOTAL</b>         | <b>180</b> | <b>140</b> |  |  |  | <b>3900</b> |

|  |  |  |                         |          |          |              |                  |
|--|--|--|-------------------------|----------|----------|--------------|------------------|
|  |  |  | <b>Mini<br/>Project</b> | <b>-</b> | <b>6</b> | <b>-----</b> | <b>Completed</b> |
|--|--|--|-------------------------|----------|----------|--------------|------------------|

**Department of Nutrition, Food Service Management and Dietetics (UG)**

| <b>PART</b>  | <b>SUBJECT</b>   | <b>PAPERS</b>   | <b>CREDITS</b>      | <b>TOTAL<br/>CREDITS</b> | <b>MARKS</b> | <b>TOTAL<br/>MARKS</b> |
|--------------|--|-----------------|---------------------|--------------------------|--------------|------------------------|
| I            | Language   | 4               | 4                   | 16                       | 100          | 400                    |
| II           | English  | 4               | 4                   | 16                       | 100          | 400                    |
| III          | Allied Theory<br>✓ Chemistry<br>✓ Food<br>Microbiology<br>✓ Biochemistry | 2<br>1<br><br>1 | 4<br>3<br><br>3     | 14                       | 100          | 400                    |
| III          | Allied Practical   | 3               | 2                   | 6                        | 100          | 300                    |
| III          | Elective   | 4               | 3                   | 12                       | 100          | 400                    |
| III          | Core Theory  | 9               | 5*5= 25<br>4*4 = 16 | 41                       | 100          | 900                    |
| III          | Core Practicals  | 5               | 3                   | 15                       | 100          | 500                    |
| IV           | EVS  | 1               | 2                   | 2                        | 100          | 100                    |
| IV           | Value Education  | 1               | 2                   | 2                        | 50           | 50                     |
| IV           | Skill Based  | 4               | 2                   | 8                        | 50           | 200                    |
| IV           | Non - Major  | 2               | 2                   | 4                        | 50           | 100                    |
| IV           | Soft Skill   | 1               | 1                   | 1                        | 50           | 50                     |
|              | Extension Activity   | -               | 3                   | 3                        | 100          | 100                    |
| <b>TOTAL</b> |  |                 |                     | <b>140</b>               |              | <b>3900</b>            |

## FOOD SCIENCE - I

| Sem | Subject Code | Category     | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|--------------|---------|--------------|---------|--------------|-----------|--------|
| I   |              | Core paper I | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | ----      | 4      |
|     |              |              | 135     | 9            | 90      | 6            |           |        |

### COURSE OBJECTIVES

The students will be able to

1. Obtain knowledge of different food groups based on their classification and nutritive value
2. Understand the scientific principles underlying food preparation and different methods of cooking foods.
3. Develop skill and techniques in food preparation with conservation of nutrients and palatability using cooking methods generally employed.

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

| CO Number | CO Statement  | Knowledge Level (K1 – K4) |
|-----------|---|---------------------------|
| CO1       | Understanding the basic food groups and its nutrients   | K1-K2                     |
| CO2       | Learning the different methods of cooking on acceptability and Palatability   | K1-K2                     |
| CO3       | Learning composition and nutritive value of cereal and its Products   | K1-K2                     |
| CO4       | Understanding the composition and nutritive value of Pulses and Nuts  | K1-K2                     |
| CO5       | Understanding the composition and nutritive value of Vegetables and Fruits.To become proficient for specialization in nutrition | K1-K4                     |

Knowledge level: K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse.

### MAPPING WITH PO

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | M   | M   |
| CO2 | S   | S   | S   | M   | M   |
| CO3 | S   | S   | S   | M   | M   |

|            |   |   |   |   |   |
|------------|---|---|---|---|---|
| <b>CO4</b> | M | M | M | M | M |
| <b>CO5</b> | M | S | M | S | S |

S – Strong, M – Medium, L – Low

## UNIT I

(10 HRS)

**Definition** of Food and Food Science. Functions of food in relation to health – classification of foods based on nutrients. **Food groups** – Basic Four, Basic Five and Basic seven.

## UNIT II

(10 HRS)

Preliminary preparation of foods prior to cooking with special reference to conservation of nutrients and palatability. Objectives of Cooking. **Cooking Methods** - Dry methods – frying, boiling, parching, and baking. Moist heat methods – Boiling, stewing, cooking under pressure. Combination methods. Microwave cooking – advantages and disadvantages.

## UNIT III

(15 HRS)

**Cereal and cereal products** – Microscopic structure of various starch granules – Nutritive value of Rice, Wheat and locally available millets. Effect of cooking on the nutritive value of cereals. Gelatinization, Dextrinization, gluten formation.

## UNIT IV

(15 HRS)

**Pulses and nuts** – composition, Nutritive value of grams, dhal – some common nuts- meat substitutes – soya products. Textured Vegetable Protein (TVP). Effect of cooking on pulses.

## UNIT V

(10 HRS)

**Vegetables and Fruits** – Classification, composition and Nutritive value – methods of minimize the loss of nutrients, color, texture, flavor, Browning reaction – changes during cooking.

### TEXT BOOKS:

| S.No. | AUTHORS      | TITLE   | PUBLISHERS                          | YEAR OF PUBLICATION |
|-------|--------------|---|-------------------------------------|---------------------|
|       | B.Srilakshmi | Food Science                                    | New Age International Private Ltd., | 2002                |
| 2.    | Swaminathan  | HandBook of Food Science and Experimental Foods | Bappco, Bangalore                   | 1992                |
| 3.    | N.           | Foods and                                       | New Age                             | 2001                |

|    |                                      |              |  |      |
|----|--------------------------------------|--------------|--|------|
|    | ShakuntalaManay, M. Shadaksharaswamy | Principles   | International Publishers                   |      |
| 4. | Mudambi, S.R. Rao, S.M               | Food Science | Wiley Eastern Ltd, New Delhi               | 1986 |
| 5. | Potter, N. and Hotch Kiss, J.H.      | Food Science | CBS Publishers and Distributors, New Delhi | 1996 |

#### REFERENCE BOOKS:

| S.No. | AUTHORS        | TITLE   | PUBLISHERS   | YEAR OF PUBLICATION |
|-------|----------------|---|--|---------------------|
| 1.    | Helen Charley  | Food Science  | Wiley Eastern Ltd, New Delhi                         | 1986                |
| 2.    | A.G. Peckam    | Foundation of Food Preparation                      | CBS Publishers and Distributors, New Delhi           | 1996                |
| 3.    | Manay. N.S     | Foods – facts and principles                        | New age International Pvt. Ltd. Publishers, Newdelhi | 1996                |
| 4.    | Swaminathan. M | Food Science and Experimental Foods                 | Ganesh and Co, Chennai,                              | 1988                |
| 5.    | Sharma.A       | Text book of Food Science & Technology, 1st edition | International Book Distributing Co.,                 | 2006                |
| 6.    | Roday.R        | Food Science & Nutrition                            | Oxford University Press                              | 1999                |
| 7.    | Jan. S         | Elements of Food Science                            | New India Publishing Agency, New Delhi-88            | -                   |

#### WEB SOURCES:

1. <https://www.cbsenetonline.in/updated-cbse-ugc-net-syllabus-for-home-science>



## FOOD SCIENCE - I

| Sem | Subject Code | Category         | Lecture |              | Theory | Practical |              | Credit |
|-----|--------------|------------------|---------|--------------|--------|-----------|--------------|--------|
| I   |              | Core practical I | Hrs/sem | Hrs/Per week | -----  | Hrs/sem   | Hrs/Per week | ---    |
|     |              |                  | 135     | 9            |        | 45        | 3            |        |

### EXPERIMENTAL FOODS PRACTICAL

1. Grouping of food – Discussion of nutritive value
2. Technique in measurement of food stuff-use of standard measuring cups and spoons.
3. Cereals Microscopic study of different starches
4. Methods of combining starch and boiling water
5. Gluten formation
6. Pulses – Effect of hard and soft water, alkali, cooking time of grams and dhals.
7. Vegetables – Effect of acids, alkali, covering, steaming and pressure cooking on the different pigments and acceptability of vegetables.
8. Fruits – Study of different methods of preventing enzymatic browning of cut fruits, pectin content of fruits.
9. Different recipes from cereals, pulses, vegetables and fruits

## FOOD SCIENCE - II

| Sem | Subject Code | Category      | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|---------------|---------|--------------|---------|--------------|-----------|--------|
| II  |              | Core paper II | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | ----      | 4      |
|     |              |               | 135     | 9            | 90      | 6            |           |        |

### COURSE OBJECTIVES

The students will be able to

1. To know the basic concepts about different foods and nutrients.
2. To develop the scientific attitude of the students towards the principle of food science.
3. To obtain the knowledge of composition and nutritive value of different foods.
4. To know the impact of cooking on various foods.

## COURSE OUTCOMES

On the successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1 – K4) |
|-----------|--|---------------------------|
| CO1       | Understanding the composition and nutritive value of Milk and Milk Products  | K1-K2                     |
| CO2       | Understanding the composition and nutritive value of Fleshy foods  | K1-K2                     |
| CO3       | Understanding the composition and nutritive value of Eggs, Fats and Oils   | K1-K2                     |
| CO4       | Understanding the composition and nutritive value of Sugar and its Products, Spices and Condiments                   | K1-K2                     |
| CO5       | Understanding the composition and nutritive value of Beverages. To become proficient for specialization in nutrition | K3-K4                     |

Knowledge level: K – Remember, K2 – Understand, K3 – Apply, K4 – Analyse.

## MAPPING WITH PO

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | M   | M   |
| CO2 | S   | S   | S   | M   | M   |
| CO3 | S   | S   | S   | M   | M   |
| CO4 | M   | M   | M   | M   | M   |
| CO5 | M   | S   | M   | S   | S   |

S – Strong, M – Medium, L – Low

## UNIT I

(15 HRS)

**Milk and milk products** – Composition and nutritive value, Principles of milk cookery, Milk protein, coagulation, problems in milk cookery. Effect of cooking and processing on milk. Milk products- Non fermented and fermented products (does not include preparation); Role of milk in cookery.

## UNIT II

- a) **Meat** – Nutritive values, methods of cooking – Post mortem changes in meat, factors affecting tenderness – organ meat.
- b) **Fish** – classification, Nutritive value – selection, methods of cooking
- c) **Poultry** –Classification,Composition and Nutritive value.

## UNIT III

- a) **Eggs** – Structure, composition, Nutritive value, selection, uses of eggs in cookery, methods of cooking eggs.
- b) **Fats and oils** – Types – Saturated, MUFA, PUFA, Hydrogenation – Invisible fats – smoking point – Rancidity.

#### UNIT IV

(10 HRS)

- a) **Sugar and sugar related products** – Jaggery - Nutritive value, characteristics and uses of various types of sugars; Sugar cookery- Crystallization and factors affecting crystallization; Stages of sugar cookery; Role of sugar in cookery.
- b) **Spices and Condiments** – Role of spices in cookery and its medicinal Uses.

#### UNIT V

**Beverages** – Beverages: Classification; Coffee beverage- Constituents and method of preparation; Tea-Types, preparation; Cocoa- Composition, nutritive value and preparation of cocoa beverage; Fruit beverages Types; Introduction to vegetable juices, milk based beverages, malted beverages, carbonated non alcoholic beverages and alcoholic beverages.

#### TEXT BOOKS:

| S.No. | AUTHORS                                 | TITLE   | PUBLISHERS                                 | YEAR OF PUBLICATION |
|-------|---|---|--|---------------------|
|       | B.Srilakshmi                            | Food Science                                    | New Age International Private Ltd.,        | 2002                |
| 2.    | Swaminathan                             | HandBook of Food Science and Experimental Foods | Bappco, Bangalore                          | 1992                |
| 3.    | N. ShakuntalaManay, M. Shadaksharaswamy | Foods and Principles                            | New Age International Publishers           | 2001                |
| 4.    | Mudambi, S.R. Rao, S.M                  | Food Science                                    | Wiley Eastern Ltd, New Delhi               | 1986                |
| 5.    | Potter, N. and Hotch Kiss, J.H.         | Food Science                                    | CBS Publishers and Distributors, New Delhi | 1996                |

#### REFERENCE BOOKS:

| S.No. | AUTHORS       | TITLE        | PUBLISHERS    | YEAR OF PUBLICATION |
|-------|---------------|--------------|---------------|---------------------|
| 1.    | Helen Charley | Food Science | Wiley Eastern | 1986                |

|    |                                  |  |  |      |
|----|----------------------------------|--|--|------|
|    |                                  |  | Ltd, New Delhi                             |      |
| 2. | A.G. Peckam                      | Foundation of Food Preparation   | CBS Publishers and Distributors, New Delhi | 1996 |
| 3. | NIIR Board                       | Handbook on Fruits, vegetables & Food processing with canning & preservation, 2nd edition, | Asia pacific business press inc., Delhi-7. | -    |
| 4. | Mudambi, R.S. and Rajagopal, M.Y | Fundamentals of Food and Nutrition   | Wiley Eastern Limited New Delhi            | 1991 |
| 5. | Potter. N.M.and Birch, G.G       | Food Science, 5th edition  | CBS Publishers and Distributors, New Delhi | 2007 |

#### WEB SOURCES:

1. <https://www.cbsenetonline.in/updated-cbse-ugc-net-syllabus-for-home-science>

#### FOOD SCIENCE - II

| Sem | Subject Code | Category         | Lecture |              | Theory | Practical |              | Credit |
|-----|--------------|------------------|---------|--------------|--------|-----------|--------------|--------|
| II  |              | Core practical I | Hrs/sem | Hrs/Per week | -----  | Hrs/sem   | Hrs/Per week | ---    |
|     |              |                  | 135     | 9            |        | 45        | 3            |        |

#### EXPERIMENTAL FOODS PRACTICAL

1. Eggs – Coagulation of egg protein – factor. Egg white foam – effect of beating, sugar, acid and temperature
2. Milk cookery – coagulation of milk protein, paneer
3. Fats and oils – Comparison of smoking temperature of some fats and oils
4. Sugar and Jaggery – different stages of crystallization of sugar
5. Different recipes from fleshy food, egg, milk and milk products
6. Beverages – preparation of stimulating, nourishing and refreshing beverages.
7. Fats and oils – Preparation of shallow and deep fried foods.
8. Sugar Cookery – Preparing recipes at different stages of sugar cookery

## **TEACHING METHODOLOGY**

- Chalk and Board teaching
- Assignments
- Group Discussions
- PPT
- Seminars
- Other Group Activity

## **SYLLABUS DESIGNER:**

1. Mrs. K. GOWTHAMI, Head and Assistant Professor, Department of Foods and Nutrition
2. Ms. S.RANJITHA, Assistant Professor, Department of Foods and Nutrition

## **DEPARTMENT OF FOODS AND NUTRITION - PG**

### **PG – FOODS AND NUTRITION-CBCS Pattern**

#### **M.Sc., FOODS AND NUTRITION**

### **PROGRAM EDUCATIONAL OBJECTIVES (PEO):**

**PEO 1:** To provide practical, field level experience in hospital administration and dietetics

**PEO 2:** To equip students to start their own Diet clinic unit, leading to entrepreneurship through learn principles of dietary counseling

**PEO 3:** To understand applications of statistical techniques for analysis and interpretation

### **PROGRAM OUTCOMES (PO):**

**PO 1:** To understand the mechanisms adopted by the human body for regulation of metabolic pathways

**PO 2:** To get an insight into interrelationships between various metabolic pathways

**PO 3:** To understand the various aspects of food product development

**PO 4:** To appreciate importance of nutrition immunity interactions and their implications

**PO 5:** To understand the rationale of prevention of various diseases/disorders

**PO 6:** To learn about the various Government programmes aimed at improving health and nutritional status of the population.

## **DEPARTMENT OF FOODS AND NUTRITION PG – FOODS AND NUTRITION-CBCS Pattern**

## SEMESTER I

| S. No | Part   | Subject           | Hrs /Week | Credit    | Title Of The Paper                              | Maximum Marks (100) |          |            |
|-------|--|-------------------|-----------|-----------|---|---------------------|----------|------------|
|       |  |                   |           |           |   | CIA                 | Uni Exam | Total      |
| 1     | Paper I  | Core Paper I      | 6         | 4         | Advance Food Science - I                        | 25                  | 75       | 100        |
| 2     | Paper II   | Core Paper II     | 6         | 4         | Clinical and Therapeutic Nutrition I            | 25                  | 75       | 100        |
| 3     | Paper III  | Core Paper III    | 6         | 3         | Applied Physiology                              | 25                  | 75       | 100        |
| 4     | Paper I  | Elective Paper I  | 6         | 3         | Communication and diet Counseling Skills        | 25                  | 75       | 100        |
| 5     | Practical I  | Core Practical I  | 3         | 4         | Advance Food Science Practical - I              | 40                  | 60       | 100        |
| 6     | Practical II   | Core Practical II | 3         | 4         | Clinical and Therapeutic Nutrition Practical- I | 40                  | 60       | 100        |
|       |  |                   | <b>30</b> | <b>22</b> | <b>SUB TOTAL</b>                                |                     |          | <b>600</b> |
| 7     | Research Funding Agencies and proposal Writingfor Grants & Fellowship(Self Study Paper) – Extra one Credit |                   |           |           |   |                     |          |            |

## SEMESTER II

| S. No | Part          | Subject            | Hrs /Week | Credit    | Title Of The Paper                               | Maximum Marks (100) |          |            |
|-------|---------------|--------------------|-----------|-----------|--|---------------------|----------|------------|
|       |               |                    |           |           |  | CIA                 | Uni Exam | Total      |
| 1     | Paper IV      | Core Paper IV      | 6         | 5         | Advance Food Science - II                        | 25                  | 75       | 100        |
| 2     | Paper V       | Core Paper V       | 5         | 5         | Clinical and Therapeutic Nutrition - II          | 25                  | 75       | 100        |
| 3     | Paper VI      | Core Paper VI      | 6         | 5         | Advance Nutritional science                      | 25                  | 75       | 100        |
| 4     | Paper II      | Elective Paper II  | 4         | 3         | Food Microbiology                                | 25                  | 75       | 100        |
| 5     | Practical III | Core Practical III | 3         | 4         | Advance Food Science Practical - II              | 40                  | 60       | 100        |
| 6     | Practical IV  | Core Practical IV  | 3         | 4         | Clinical and Therapeutic Nutrition Practical- II | 40                  | 60       | 100        |
| 7     |               | Compulsory paper   | 3         | 2         | Human Rights                                     | 25                  | 75       | 100        |
|       |               |                    | <b>30</b> | <b>28</b> | <b>SUB TOTAL</b>                                 |                     |          | <b>700</b> |

| SEMESTER III |  |                    |           |        |  |                     |          |       |
|--------------|--|--------------------|-----------|--------|--|---------------------|----------|-------|
| S. No        | Part   | Subject            | Hrs /Week | Credit | Title Of The Paper                           | Maximum Marks (100) |          |       |
|              |  |                    |           |        |  | CIA                 | Uni Exam | Total |
| 1            | Paper VII  | Core Paper VII     | 8         | 5      | Biochemical Basis of Nutrition               | 25                  | 75       | 100   |
| 2            | Paper VIII   | Core Paper VIII    | 8         | 5      | Public Health Nutrition                      | 25                  | 75       | 100   |
| 3            | Paper IX   | Core Paper IX      | 6         | 4      | Research Methodology & Biostatistics         | 25                  | 75       | 100   |
| 4            | Paper III  | Elective Paper III | 5         | 3      | Nutrigenomics                                | 25                  | 75       | 100   |
| 5            | Practical V  | Core Practical V   | 3         | 4      | Biochemical Basis of Nutrition Practical     | 40                  | 60       | 100   |
|              |  |                    | 30        | 21     | SUB TOTAL                                    |                     |          | 500   |
| 6            | Applications of Computer and Software in Nutrition Research(Self Study Paper) – Extra One Credit |                    |           |        |  |                     |          |       |
| SEMESTER IV  |  |                    |           |        |  |                     |          |       |
| S. No        | Part   | Subject            | Hrs /Week | Credit | Title Of The Paper                           | Maximum Marks (100) |          |       |
|              |  |                    |           |        |  | CIA                 | Uni exam | Total |
| 1            | Paper X  | Core Paper X       | 7         | 4      | Food Standards and Quality Control           | 25                  | 75       | 100   |
| 2            | Paper XI   | Core Paper XI      | 8         | 4      | Advanced Techniques of Food Analysis         | 25                  | 75       | 100   |
| 3            | Paper IV   | Elective Paper IV  | 6         | 3      | UGC NET for Home science                     | 25                  | 75       | 100   |
| 4            | Practical VI   | Core Practical VI  | 3         | 3      | AdvanceTechniques of food analysis practical | 40                  | 60       | 100   |
| 5            |  | Project            | 6         | 5      | Dissertation                                 | 25                  | 75       | 100   |
|              |  |                    | 30        | 19     | SUB TOTAL                                    |                     |          | 500   |
|              |  |                    | 120       | 90     | TOTAL  |                     |          | 2300  |

**Department of Foods and Nutrition (PG)**

| <b>PART</b> | <b>SUBJECT</b> | <b>PAPERS</b> | <b>CREDITS</b>       | <b>TOTAL CREDITS</b> | <b>MARKS</b> | <b>TOTAL MARKS</b> |
|-------------|----------------|---------------|----------------------|----------------------|--------------|--------------------|
| III         | Core Theory    | 11            | 5*5 = 25<br>4*5 = 20 | 48                   | 100          | 1100               |

|              |                  |   |                     |           |     |             |
|--------------|------------------|---|---------------------|-----------|-----|-------------|
|              |                  |   | 3*1 = 3             |           |     |             |
| III          | Core Practical   | 6 | 5*4 = 20<br>1*3 = 3 | 23        | 100 | 600         |
| III          | Elective         | 4 | 3                   | 12        | 100 | 400         |
|              | Compulsory Paper | 1 | 2                   | 2         | 100 | 100         |
|              | Project          | 1 | 5                   | 5         | 100 | 100         |
| <b>TOTAL</b> |                  |   |                     | <b>90</b> |     | <b>2300</b> |

### FOOD SCIENCE - I

| Sem | Subject Code | Category     | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|--------------|---------|--------------|---------|--------------|-----------|--------|
| I   |              | Core paper I | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | ----      | 4      |
|     |              |              | 135     | 9            | 90      | 6            |           |        |

### COURSE OBJECTIVES

The students will be able to

4. Obtain knowledge of different food groups based on their classification and nutritive value
5. Understand the scientific principles underlying food preparation and different methods of cooking foods.
6. Develop skill and techniques in food preparation with conservation of nutrients and palatability using cooking methods generally employed.

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

| CO Number  | CO Statement  | Knowledge Level (K1 – K4) |
|------------|---|---------------------------|
| <b>CO1</b> | Understanding the basic food groups and its nutrients                       | K2                        |
| <b>CO2</b> | Learning the different methods of cooking on acceptability and Palatability | K2                        |
| <b>CO3</b> | Learning composition and nutritive value of cereal and its Products         | K2                        |
| <b>CO4</b> | Understanding the composition and nutritive                                 | K2                        |



|            |  |            |
|------------|--|------------|
|            | value of Pulses and Nuts   |            |
| <b>CO5</b> | Understanding the composition and nutritive value of Vegetables and Fruits. To become proficient for specialization in nutrition | K2, K3, K4 |

Knowledge level: K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse.

#### MAPPING WITH PO

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | M          | M          |
| <b>CO2</b> | S          | S          | S          | M          | M          |
| <b>CO3</b> | S          | S          | S          | M          | M          |
| <b>CO4</b> | M          | M          | M          | M          | M          |
| <b>CO5</b> | M          | S          | M          | S          | S          |

S – Strong, M – Medium, L – Low

#### UNIT I

**(10 HRS)**

**Definition** of Food and Food Science. Functions of food in relation to health – classification of foods based on nutrients. **Food groups** – Basic Four, Basic Five and Basic seven.

#### UNIT II

**(10 HRS)**

**a)** Preliminary preparation of foods prior to cooking with special reference to conservation of nutrients and palatability.

**b)** Objectives of Cooking. **Cooking Methods** - Dry methods – frying, boiling, parching and baking. Moist heat methods – Boiling, stewing, cooking under pressure. Combination methods. Microwave cooking – advantages and disadvantages.

#### UNIT III

**(15 HRS)**

**Cereal and cereal products** – Microscopic structure of various starch granules – Nutritive value of Rice, Wheat and locally available millets. Milling of Rice and Wheat. Effect of cooking on the nutritive value of cereals. Gelatinization, Dextrinization, Gluten formation.

#### UNIT IV

**(15 HRS)**

**Pulses and nuts** – composition, Nutritive value of grams, dhal – some common nuts- meat substitutes – soya products. Textured Vegetable Protein (TVP).Effect of cooking on pulses.

**UNIT V****(10 HRS)**

**a) Vegetables**– Classification, Composition and Nutritive value, Pigments, Organic acids, Enzymes and Flavor Compounds. Effect of different cooking methods and Storage of Vegetables.

**b) Fruits** – Classification, Composition and Nutritive Value, Post – harvest changes and storage, Enzymatic Browning.

**TEXT BOOKS:**

| S.No. | AUTHORS                                 | TITLE   | PUBLISHERS                                 | YEAR OF PUBLICATION |
|-------|---|---|--|---------------------|
|       | B.Srilakshmi                            | Food Science                                    | New Age International Private Ltd.,        | 2002                |
| 2.    | Swaminathan                             | HandBook of Food Science and Experimental Foods | Bappco, Bangalore                          | 1992                |
| 3.    | N. ShakuntalaManay, M. Shadaksharaswamy | Foods and Principles                            | New Age International Publishers           | 2001                |
| 4.    | Mudambi, S.R. Rao, S.M                  | Food Science                                    | Wiley Eastern Ltd, New Delhi               | 1986                |
| 5.    | Potter, N. and Hotch Kiss, J.H.         | Food Science                                    | CBS Publishers and Distributors, New Delhi | 1996                |

**REFERENCE BOOKS:**

| S.No. | AUTHORS        | TITLE                          | PUBLISHERS   | YEAR OF PUBLICATION |
|-------|----------------|--------------------------------|--|---------------------|
| 1.    | Helen Charley  | Food Science                   | Wiley Eastern Ltd, New Delhi                         | 1986                |
| 2.    | A.G. Peckam    | Foundation of Food Preparation | CBS Publishers and Distributors, New Delhi           | 1996                |
| 3.    | Manay. N.S     | Foods – facts and principles   | New age International Pvt. Ltd. Publishers, Newdelhi | 1996                |
| 4.    | Swaminathan. M | Food Science and               | Ganesh and Co,                                       | 1988                |

|    |          |   |   |      |
|----|----------|---|---|------|
|    |          | Experimental Foods                                  | Chennai,                                  |      |
| 5. | Sharma.A | Text book of Food Science & Technology, 1st edition | International Book Distributing Co.,      | 2006 |
| 6. | Roday.R  | Food Science & Nutrition                            | Oxford University Press                   | 1999 |
| 7. | Jan. S   | Elements of Food Science                            | New India Publishing Agency, New Delhi-88 | -    |

#### WEB SOURCES:

2. <https://www.cbsenetonline.in/updated-cbse-ugc-net-syllabus-for-home-science>

#### FOOD SCIENCE - I

| Sem | Subject Code | Category         | Lecture |              | Theory | Practical |              | Credit |
|-----|--------------|------------------|---------|--------------|--------|-----------|--------------|--------|
| I   |              | Core practical I | Hrs/sem | Hrs/Per week | -----  | Hrs/sem   | Hrs/Per week | ---    |
|     |              |                  | 135     | 9            |        | 45        | 3            |        |

#### EXPERIMENTAL FOODS PRACTICAL

10. Grouping of food – Discussion of nutritive value
11. Technique in measurement of food stuff-use of standard measuring cups and spoons.
12. Cereals Microscopic study of different starches
13. Methods of combining starch and boiling water
14. Gluten formation
15. Pulses – Effect of hard and soft water, alkali, cooking time of grams and dhals.
16. Vegetables – Effect of acids, alkali, covering, steaming and pressure cooking on the different pigments and acceptability of vegetables.
17. Fruits – Study of different methods of preventing enzymatic browning of cut fruits, pectin content of fruits.
18. Different recipes from cereals, pulses, vegetables and fruits

## CLINICAL AND THERAPEUTIC NUTRITION –I

| Sem | Subject Code | Category      | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|---------------|---------|--------------|---------|--------------|-----------|--------|
| I   |              | Core Paper II | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----     | 4      |
|     |              |               | 135     | 9            | 90      | 6            |           |        |

### COURSE OBJECTIVES

To enable the students to-

1. Impart basic knowledge in the field of dietetics.
2. Develop capacity and aptitude for taking up dietetics as a profession.
3. Study the aetiology, symptoms and medical nutrition therapy in various diseases
4. Understand and learn the principles of diet and nutrient modifications for various diseases.

### COURSE OUTCOMES

On the successful completion of the course, students will be able to

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | Introduction to Clinical and Therapeutic Nutrition                          | K2                      |
| CO2       | Mechanism of Nutritional care and its importance                            | K3, K4                  |
| CO3       | Nutritional management in Gastro Intestinal Diseases                        | K3, K4                  |
| CO4       | Nutritional management in Weight Imbalance                                  | K3, K4                  |
| CO5       | Nutritional management in Allergy, Nervous System and Bone health disorders | K3,K4                   |

Knowledge level: K1 – Remember, K2-Understand, K3- Apply, K4-Analyse.

### MAPPING WITH PO

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | S   | S   | S   |
| CO2 | S   | S   | S   | S   | S   | S   |
| CO3 | S   | S   | S   | S   | S   | S   |
| CO4 | S   | S   | S   | S   | S   | S   |
| CO5 | S   | S   | S   | S   | S   | S   |

S-Strong; M-Medium, L- Low

## UNIT I

(8 HRS)

### INTRODUCTION TO CLINICAL AND THERAPEUTIC NUTRITION

**A. Definition and history of dietetics, Dietitian as part of the Medical Team: -**

Types of dietitian and their role. **Nutritional Screening and care:** - Nutritional Assessment, Diagnosis, Intervention and evaluation. **Nutrient and Drug Interaction:** - Effect and Interaction of foods, nutrients and nutritional status on drugs.

**B. Basic concepts of Diet Therapy- Routine hospital diets:** - regular diets, clear fluid diet, full fluid diet, soft diet, bland diet, Modified diets,

- **Enteral Nutrition:** - Definition, Sites of Diffusion, Types and sizes of Tubes, Types of feeds, Composition and Delivery methods and its complications.
- **Parenteral Nutrition:** - Definition, Type of access, Parenteral nutrition solutions/composition. Administration methods, Monitoring & complications

## UNIT II

(8 HRS)

### NUTRITIONAL CARE IN DISEASE CONDITION

**A. Nutritional Management in infection and fever**

Defense mechanism, Metabolic changes during infection, Classification and entity of fever infection, Typhoid/ TB / parasitic infestation/ Aids, Cancer.

**B. Nutritional Management of physiological stress and Critical Care**

Nutrition in wound healing, **Surgery:** Pre & post surgical dietary management, **Burns** -Classification, Complication and Dietary management. **Trauma-** Dietary management, **Sepsis-** systemic, metabolic and catabolic responses, Systemic Inflammatory Response Syndrome(SIRS), Multiple Organ Dysfunction Syndrome(MODS), Dietary Management, Dumping Syndrome.

## UNIT III

(18 HRS)

**Nutritional Management of GI diseases:** Definition, Aetiology, Symptoms, Physiological and functional changes and dietary management and impact on Nutritional status of

**A. Diseases of Esophagus and stomach**

Esophagitis (GERD), Hernia, Tonsillectomy, Dyspepsia, Peptic ulcer, Gastritis, Gastrectomy: Dumping syndrome

**B. Intestinal diseases**

Flatulence, Diarrhea, Constipation, Hemorrhoids, Diverticular disease, Duodenal ulcer, Inflammatory Diseases of Bowel-Crohn's disease and ulcerative colitis, Irritable bowel syndrome, Colostomy, Ileostomy

**C. Malabsorption syndrome**

Celiac disease (Tropical sprue), Steatorrhea, Intestinal Brush border diseases

**D. Protein losing enteropathy**

**UNIT IV**

**(14 HRS)**

**A. Nutritional Management in Weight Imbalance**

Prevalence and Classification, Components of body weight, Guidelines for Calculating Desirable body weight, Neural and Hormonal control of appetite and food intake.

**B. Nutritional Management in Obesity**

Etiology, Classification, theories and Energy balance, Physiology of the obese state & Clinical manifestations, Risk factors, Complications and Lifestyle modifications, Nutraceutical, Dietary and Surgical management

**C. Nutritional Management in Underweight** -Etiology and dietary management

**D. Nutritional Management in Eating disorders** - Definition, Signs and symptoms and Complications/health risks, Diagnostic criteria and nutrition management in Anorexia Nervosa, Bulimia Nervosa and Binge eating. Refeeding syndrome: - Definition, causes, symptoms, complication and treatment.

**UNIT V**

**(12 HRS)**

**A. Dietary management in allergy**

Definition, Symptoms and Diagnostic tests, Common food allergens and Mechanism of food allergy, Elimination diets, Milk allergy in infants and prevention of food allergy

**B. Dietary Management in Nervous System Disorders**

Etiology and Clinical features and Dietary management for – Parkinson's disease and Alzheimer's disease

**C. Dietary Management in Bone Health disorders**

Prevalence, Types and Etiology and Role of Nutrients in Osteoporosis and Osteomalacia, Bone Mineral Density (BMD) and Peak Bone Mass (PBM)

**TEXT BOOKS:**

1. Swaminathan S.: Advanced Textbook On Food & Nutrition Vol. 1 & N (2nd Ed. Revised \_ Enlarged) Bapp Co. 1985.
2. Srilakshmi, (2007): Dietetics, published by K.K. Gupta For New age International Pvt. Ltd. New Delhi.
3. Shills and Young. Modern Nutrition In Health And Disease
4. Robinson Ch., M.B. Lawlea, W.L., Chenoweth, And A.E., Carwick : Normal And Therapeutic Nutrition, Macmillan Publishing Company.

5. Mahan L.K., Sylvia Escott-Stump (2000): Krause's Food Nutrition and Diet Therapy 10th Edition, W.B. Saunders Company London.
6. Clinical dietetics and nutrition by F.P Antia and Philip Antia.
7. Davis J. and Sherer, K. (1994): Applied Nutrition and Diet Therapy for Nurses, 2nd edition, W.B. Saunders Co.
8. Sue Rodwell Williams, (1993): Nutrition, Diet Therapy, (7th Ed): W.B. Saunders Company London.

#### **REFERENCE BOOKS**

1. Antia F.P. And Philip Abraham (2001) Clinical Nutrition and Dietetics, Oxford Publishing Company.
2. Alfred H.Katz, Prevention and health, the Haworth, Press, New York 1999.
3. Gopalan C., Ram Sastri B.V. And BalSubramaniam S.C., (2006) Nutritive Value of Indian Foods, Hyderabad, National Institute of Nutrition, Indian Council of Medical Research.
4. Raheena M. Begum (1989): A Text Book of Foods Nutrition and Dietetics, Wiley Eastern Ltd., New Delhi.
5. Anderson L., M. V. Dibble, P. R. Turkki, H. S. Mitchell and H. J. Rynbergen Nutrition in Health and Disease, 17th ed., J. B. Lippincott Co., Philadelphia, 1982.
6. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
7. Seth V and Singh K (2007). Diet Planning through the Life Cycle Part II: Diet Therapy. A Practical Manual, 4th edition. Elite Publishing House Pvt. Ltd.
8. ICMR (1999). Nutritive Value of Indian Foods. National Institute of Nutrition, Indian Council of Medical Research, Hyderabad.
9. Khanna K, Gupta S, Seth R, Passi SJ, Mahna R, Puri S (2013). Textbook of Nutrition and Dietetics. Phoenix Publishing House Pvt. Ltd.
10. Mahan L K and Escott Stump S (2013). Krause's Food & Nutrition Therapy, 13th ed. Saunders-Elsevier.
11. Stacy Nix (2009). William's Basic Nutrition and Diet Therapy, 13th Edition. Elsevier Mosby.

#### **TEACHING METHODOLOGY**

- Lecture
- Active learning methodology
- Practical
- Group discussions
- Seminar
- Field Visits
- Assignments

## CLINICAL AND THERAPEUTIC NUTRITION –I

| Sem | Subject Code | Category          | Lecture |              | Theory | Practical |              | Credit |
|-----|--------------|-------------------|---------|--------------|--------|-----------|--------------|--------|
| I   |              | Core Practical II | Hrs/sem | Hrs/Per week | -----  | Hrs/sem   | Hrs/Per week | 4      |
|     |              |                   | 135     | 9            |        | 45        | 3            |        |

1. Grouping of foods according to ICMR classification
2. Find the percentage of edible portion of foods
3. Food Exchange System and Standardization of Raw to Cooked Foods
4. Development of a Ready – Reckoner for calculating nutrient content of various foods, portion size and volume, conversion of cooked to raw equivalent of various foods. Learning how to use different nutrition assessment tools
5. Planning of routine hospital diet– Full fluid, clear liquid, soft, bland, regular diet, High calorie and low calorie diet, High residue and low residue diet
6. Diet in Infections and Physiological Stress – Typhoid, Cholera, Asthma, Ebola and Burns
7. Diet in Gastro Intestinal disorders – Peptic Ulcer, Diarrhea, Protein losing enteropathy and constipation
8. Diet in Liver Diseases – Jaundice, Fatty Liver and Gall stones
9. Diet in Diabetes Mellitus – Insulin Dependent Diabetes Mellitus and Non Insulin Dependent Diabetes Mellitus and Diabetes with complications
10. Diet for metabolic diseases – Gout, Galactose restricted diet and Tyrosinemia
11. Planning of diet in deficiency diseases- Micronutrient deficiency (Any Two), PEM

### SYLLABUS DESIGNER:

1. Mrs. K. GOWTHAMI, Head And Assistant Professor, Department of Foods and Nutrition
2. Dr. R. DURGADEVI, Assistant Professor, Department of Foods and Nutrition

## APPLIED PHYSIOLOGY

| Sem | Subject Code | Category       | Lecture |              | Theory  |              | Credit |
|-----|--------------|----------------|---------|--------------|---------|--------------|--------|
| I   |              | Core paper III | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | 3      |
|     |              |                | 90      | 6            | 90      | 6            |        |



**COURSE OBJECTIVE:**

The students will be able to

1. Learn the physiological conditions related to Nutrition.
2. Understand the recent advances in Applied Physiology.

**COURSE OUTCOMES**

On the successful completion of the course, students will be able to

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| <b>CO1</b>       | Understanding the Concept of Physiological functions of the body                   | k2                             |
| <b>CO2</b>       | Understanding the Hypo/Hyper secretions and its effects in the body                | k2                             |
| <b>CO3</b>       | Understanding the importance of different systems of the body and its deficiencies | K3                             |
| <b>CO4</b>       | Understanding the biochemical basics of different body parts                       | K3                             |
| <b>CO5</b>       | Understanding the interrelationship between different parts of the body            | K3, k4                         |

Knowledge level: K1 – Remember, K2-Understand, K3- Apply, K4-Analyse.

**MAPPING WITH PO**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | M          | S          | M          |
| <b>CO2</b> | M          | M          | M          | M          | S          |
| <b>CO3</b> | S          | S          | M          | M          | M          |
| <b>CO4</b> | M          | M          | S          | M          | M          |
| <b>CO5</b> | M          | S          | S          | S          | S          |

S-Strong; M-Medium, L- Low

**UNIT-I**

**(15hrs)**

**PHYSIOLOGY OF CELLS AND NERVOUS SYSTEM**

**a) Cells and Tissues** - Cells, Tissues - Classification of Tissues. Water, Body fluid compartment, membrane potential, Inter cellular communication- Homeostasis. Electrolytes, Acid-Base Balance in the body.

**b) Nervous System**- Spinal cord : Structure and functions. Ascending and descending tracts, reflex action. Brain – Structure and functions of cerebrum, optic thalamus, mid brain, pons, medulla oblongata, hypothalamus,

cerebellum. Autonomic Nervous System: Sympathetic and parasympathetic. Mechanism of energetics of muscle contraction, muscle fatigue. Special Sense Organs – Basic Physiology and Functions.

## **UNIT-II**

**(20hrs)**

### **ENDOCRINOLOGY AND REPRODUCTION**

**a) Endocrine System** - Anatomy of endocrine glands. Hormones- Mode of action, functions of hormones of the endocrine glands-Pituitary, Adrenal, Thyroid, Gonadal hormones, Pancreas, Pineal body and Parathyroid, Hypo and Hyper functions of the glands.

**b) Reproductive system** – Male Reproductive system - Development of Gonads and Genitalia, Testis and Spermatogenesis, Female Reproductive System – Oogenesis, Physiological Changes and hormones during menstruation, Pregnancy, Parturition and lactation.

## **UNIT- III**

**(15hrs)**

### **RESPIRATION AND GASTRO- INTESTINAL**

**a) Respiratory System** - Structure of respiratory organs, mechanics of respiration, structure of lung, chemistry of respiration, artificial respiration, control of respiration. Oxygen requirement for nutrients, composition of inspired and expired gas, partial Pressure of gas, diffusion gradient and CO<sub>2</sub>, Hemoglobin affinity for O<sub>2</sub> and dissociation.

**b) Digestive System** - General anatomy of digestive system. Digestion in the mouth, stomach and intestines. Movement of intestine. Mechanism of secretion of gastric juice. Movements of small intestine, role of Pancreas. Liver – structure and function. Hunger, Appetite, Satiety- physiological and psychological factors affecting food intake, circadian rhythm in GI tract secretions.

## **UNIT- IV**

**(20hrs)**

### **CIRCULATION**

**a) Blood and Blood Platelets** - Composition, functions, RBC – Structure, functions, erythropoiesis, haemoglobin. WBC – Structure, functions, classification. Structure, functions, reticulo endothelial system. Blood groups – Rh factor. Blood coagulation. Spleen – Structure and functions. Lymph – Lymphatic system.

**b) Heart and Circulation:** Heart - Anatomy and Physiology. Blood vessels – Structure of artery, vein, capillaries, cardiac output, arterial blood pressure, clinical measurement of blood pressure, properties of cardiac muscle, origin and conduction of heart beat, cardiac cycle, regulation of heart action. Determination of blood groups. Identification of different types of white blood cells. Arterial blood pressure and pulse rate. ECG- interpretation, Latest development in cardiac condition, cardio vascular mechanism and homeostasis.

## **UNIT- V**

### **IMMUNITY AND EXCRETION**

**(20hrs)**

**a) Immune System** - Definition and Properties of immunity, lymphocytes in immunity, antigens –types, properties, antigen- antibody interaction, development of cellular immunity, development of humoral immunity, antibodies, immune deficiency diseases, autoimmune diseases, allergy and immunology, hyper sensitivity reactions.

**b) Excretory System** - Physiology of kidney-nephron, formation of urine, voiding of urine. Skin – structure and functions, regulation of body temperature.

### **Reference Books**

1. Astrand, P.O. and Rodahi, K., 1981. Textbook of work Physiology, McGraw Hill Book Company, New York.
2. Best, H. and Taylor, B., 1992. The Physiological basis for Medical Practice, 8th edition. The Williams and Wilkins Company.
3. Chatterjee, C.C., Juman, 1987. Human Physiology, Vol. I and II, Medical Allied Agency, Calcutta.
4. Guyton, A.C., 1991. Textbook of Medical Physiology, 14th edition, W.B. Saunders Company, Philadelphia.
5. Samson and Wright, 1989. Applied Physiology, Tandon Publication.

### **Journals**

1. The Journal of Laboratory and Clinical Medicine, C.V. Mosby Company.
2. The Indian Journal of Clinical Nutrition, American Society for Clinical Nutrition, Inc., U.S.A.

### **TEACHING METHODOLOGY**

- Chalk and board teaching
- Assignments
- Group discussions

- PPT
- Seminars
- Other Group activity

#### **SYLLABUS DESIGNER:**

1. Mrs. K. GOWTHAMI, Head And Assistant Professor, Department of Foods and Nutrition
2. Mrs. R. TAMILSELVI, Assistant Professor, Department of Foods and Nutrition

#### **COMMUNICATION AND DIET COUNSELLING SKILLS**

| Sem | Subject Code | Category         | Lecture |              | Theory  |              | Credit |
|-----|--------------|------------------|---------|--------------|---------|--------------|--------|
| I   |              | Elective Paper I | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | 3      |
|     |              |                  | 90      | 6            | 90      | 6            |        |

#### **COURSE OBJECTIVE:**

The students will be able to

1. Know the principles of diet counseling
2. Understand the role of counselors.
3. Apply the knowledge to solve the nutritional problems.

#### **COURSE OUTCOMES**

On the successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | Identify basic elements of communication to influence behavior   | k2                      |
| CO2       | Describe nutrition education and health education processes.   | k2                      |
| CO3       | Compare between the role of a health educator and nutrition education specialist                               | k2                      |
| CO4       | Explain how a health educator can help a client with nutritional problems related to certain health conditions | k2                      |
| CO5       | Identify the behavioral theories, and how it's important to build theoretical educational program              | K3, k4                  |

Knowledge level: K1 – Remember, K2-Understand, K3- Apply, K4-Analyse.

## MAPPING WITH PO

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | S   | M   |
| CO2 | M   | M   | M   | M   | S   |
| CO3 | S   | S   | M   | M   | M   |
| CO4 | M   | M   | S   | M   | M   |
| CO5 | M   | S   | S   | S   | S   |

S-Strong; M-Medium, L- Low

### UNIT-I

(15hrs)

#### Practical consideration in giving dietary advice and counseling

- a) Factors affecting and individual food choice. b) Communication of dietary advice c) Consideration of behaviour modification d) Motivation.

### UNIT-II

(20hrs)

#### Counseling and educating patient

- a) Introduction to nutrition counseling b) Determining the role of nutrition counselor c) Responsibilities of the nutrition counselor d) Practitioner v/s client managed care e) Conceptualizing entrepreneur skills and behavior f) Communication and negotiation skills.

### UNIT- III

(15hrs)

#### Teaching aids used by dietitians

charts, leaflets, posters etc., preparation of teaching material for patients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis and cirrhosis.

### UNIT- IV

(20hrs)

#### Computer application

- a) Use of computers by dietitian b) Dietary computations c) Dietetic management d) Education/ training e) Information storage f) Administrations g) Research

#### Using statistical applications in counselling:

- a) Execution of software packages b) Straight line, frequency table, bar diagram, pie chart, Preparation of dietary charts for patients c) Statistical computation- mean, median, standard deviation, conclusion and regression test.

### UNIT- V – Activities

(20hrs)

1. Project planning for any one disease.
2. Computer application for different diseases.
3. Submitting computed data.

4. Preparations of teaching aids in the field of nutrition.
5. Preparation of case history of a patient and feeding of information in the hard disc.

### **REFERENCE BOOKS:**

1. Michael J. Gibney, Barrie M. Margetts, John M. Kearney and Lenore Arab, Public health nutrition, Blackwell publishing company. 2005.
  2. Mark Lawrence and Tony Worsley, Public health nutrition from principles to practice, Chennai microprint (P) Ltd., Chennai. 2008.
  3. Srilakshmi. B, Nutrition science, fifth edition, New age international (P) limited. 2016.
- Park.K, Text book of preventive and social medicine, BanarsidasBhanot publishers, Jabalpur. 1997

### **TEACHING METHODOLOGY**

- Chalk and board teaching
- Assignments
- Group discussions
- PPT
- Seminars
- Other Group activity

### **SYLLABUS DESIGNER:**

1. Mrs. K. GOWTHAMI, Head And Assistant Professor, Department of Foods and Nutrition

### **RESEARCH FUNDING AGENCIES AND PROPOSAL WRITING FOR GRANTS AND FELLOWSHIP (SELF STUDY PAPER)**

#### **UNIT I**

International Funding Agencies – International foundation for science, Third world academy of sciences (TWAS), Third world Network of Scientific organizations (TWNSO), European Commission (EC), ICEF (India - Canadian Environment Facility), OECD/Hunger Campaign, United Nations Centre for Human Settlements (UNCHS), United Nations Food and Agricultural Organization (FAO), UNESCO

#### **UNIT II**

National Funding Agents – UGC, AICTE, CSIR, DRDO, DAE, DBT, DOC, DOD, DST, DSIR, ICMR, IMD, ISRO, MOCIT, MOEF, MFPI, MNES, CPRI, MOWR, DOE, STARD, STAWS, INSA, Student Programme for Excellence in Experimental Design (SPEED)

### UNIT III

Local Funding Agents – State Science and Technological Programme, AIDS Prevention and Control (APAC), TNSCST, NCBS, TNSRO, Department of employment and training

### UNIT IV

Elements of Proposal - Introduction ,Purpose of the study, Literature review, Hypothesis, Methodology, Plan - time frame and schedule of activities, Significance of the Study, Reference, Budget, Details of research team (signed CV)

### UNIT V

#### Writing proposal for...

- a) Write a Sample Proposal to any one International Funding Agency
- b) Write a Sample Proposal to any one National Funding Agency
- c) Write a Sample Proposal to any one Local Funding Agency

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2. Dr. R. DURGADEVI, Assistant Professor, Department of Foods and Nutrition
3. Ms. S.M. SURUTHIKEERTHI, Assistant Professor, Department of Foods and Nutrition

### ADVANCE FOOD SCIENCE - II

| Sem | Subject Code | Category      | Lecture |              | Theory  |              | Practical | Credit |
|-----|--------------|---------------|---------|--------------|---------|--------------|-----------|--------|
| II  |              | Core paper IV | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | ----      | 5      |
|     |              |               | 135     | 9            | 90      | 6            |           |        |

#### COURSE OBJECTIVES

The students will be able to

1. To know the basic concepts about different foods and nutrients.
2. To develop the scientific attitude of the students towards the principle of food science.
3. To obtain the knowledge of composition and nutritive value of different foods.
4. To know the impact of cooking on various foods.

## COURSE OUTCOMES

On the successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1 – K4) |
|-----------|--|---------------------------|
| CO1       | Understanding the composition and nutritive value of Milk and Milk Products  | K1-K2                     |
| CO2       | Understanding the composition and nutritive value of Fleshy foods  | K1-K2                     |
| CO3       | Understanding the composition and nutritive value of Eggs, Fats and Oils   | K1-K2                     |
| CO4       | Understanding the composition and nutritive value of Sugar and its Products, Spices and Condiments                   | K1-K2                     |
| CO5       | Understanding the composition and nutritive value of Beverages. To become proficient for specialization in nutrition | K3-K4                     |

Knowledge level: K – Remember, K2 – Understand, K3 – Apply, K4 – Analyse.

## MAPPING WITH PO

| COS | PO1 | PO2 | PO3 | PO4 | PO5 |
|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | M   | M   |
| CO2 | S   | S   | S   | M   | M   |
| CO3 | S   | S   | S   | M   | M   |
| CO4 | M   | M   | M   | M   | M   |
| CO5 | M   | S   | M   | S   | S   |

S – Strong, M – Medium, L – Low

## UNIT I

(15 HRS)

**Milk and milk products** – Composition and nutritive value, Principles of milk cookery, Milk protein, coagulation, problems in milk cookery. Effect of cooking and processing on milk. Milk products- Non fermented and fermented products (does not include preparation); Role of milk in cookery.

## UNIT II

- d) **Meat** – Nutritive values, methods of cooking – Post mortem changes in meat, factors affecting tenderness – organ meat.
- e) **Fish** – classification, Nutritive value – selection, methods of cooking
- f) **Poultry** –Classification,Composition and Nutritive value.



### UNIT III

- c) **Eggs** – Structure, composition, Nutritive value, selection, uses of eggs in cookery, methods of cooking eggs.
- d) **Fats and oils** – Types – Saturated, MUFA, PUFA, Hydrogenation – Invisible fats – smoking point – Rancidity.
- e) **Sugar and sugar related products** – Jaggery - Nutritive value, characteristics and uses of various types of sugars; Sugar cookery- Crystallization and factors affecting crystallization; Stages of sugar cookery; Role of sugar in cookery.

### UNIT IV

(10 HRS)

- c) **Spices and Condiments** – Role of spices in cookery and its medicinal Uses.
- d) **Beverages** – Beverages: Classification; Coffee beverage- Constituents and method of preparation; Tea-Types, preparation; Cocoa- Composition, nutritive value and preparation of cocoa beverage; Fruit beverages Types; Introduction to vegetable juices, milk based beverages, malted beverages, carbonated non alcoholic beverages and alcoholic beverages.

### UNIT V

**Evaluation of Food Quality** – Sensory Evaluation, Sensory characteristics of food, Conducting Sensory Tests, Evaluation Card, Types of Tests, Difference Tests, Rating Tests, Sensitivity Tests, Objective Evaluation, Instruments used for Texture Evaluation, Latest Technioques in Evaluating the food quality.

#### TEXT BOOKS:

| S.No. | AUTHORS                                 | TITLE   | PUBLISHERS                          | YEAR OF PUBLICATION |
|-------|---|---|-------------------------------------|---------------------|
|       | B.Srilakshmi                            | Food Science                                    | New Age International Private Ltd., | 2002                |
| 2.    | Swaminathan                             | HandBook of Food Science and Experimental Foods | Bappco, Bangalore                   | 1992                |
| 3.    | N. ShakuntalaManay, M. Shadaksharaswamy | Foods and Principles                            | New Age International Publishers    | 2001                |
| 4.    | Mudambi, S.R. Rao, S.M                  | Food Science                                    | Wiley Eastern Ltd, New Delhi        | 1986                |
| 5.    | Potter, N. and Hotch Kiss, J.H.         | Food Science                                    | CBS Publishers and Distributors,    | 1996                |

|  |  |  |           |  |
|--|--|--|-----------|--|
|  |  |  | New Delhi |  |
|--|--|--|-----------|--|

#### REFERENCE BOOKS:

| S.No. | AUTHORS                          | TITLE  | PUBLISHERS                                 | YEAR OF PUBLICATION |
|-------|----------------------------------|--|--|---------------------|
| 1.    | Helen Charley                    | Food Science   | Wiley Eastern Ltd, New Delhi               | 1986                |
| 2.    | A.G. Peckam                      | Foundation of Food Preparation   | CBS Publishers and Distributors, New Delhi | 1996                |
| 3.    | NIIR Board                       | Handbook on Fruits, vegetables & Food processing with canning & preservation, 2nd edition, | Asia pacific business press inc., Delhi-7. | -                   |
| 4.    | Mudambi, R.S. and Rajagopal, M.Y | Fundamentals of Food and Nutrition   | Wiley Eastern Limited New Delhi            | 1991                |
| 5.    | Potter. N.M.and Birch, G.G       | Food Science, 5th edition  | CBS Publishers and Distributors, New Delhi | 2007                |

#### WEB SOURCES:

1. <https://www.cbsenetonline.in/updated-cbse-ugc-net-syllabus-for-home-science>

#### ADVANCE FOOD SCIENCE - II

| Sem | Subject Code | Category           | Lecture |              | Theory | Practical |              | Credit |
|-----|--------------|--------------------|---------|--------------|--------|-----------|--------------|--------|
| II  |              | Core practical III | Hrs/sem | Hrs/Per week | -----  | Hrs/sem   | Hrs/Per week | 4      |
|     |              |                    | 135     | 9            |        | 45        | 3            |        |

#### EXPERIMENTAL FOODS PRACTICAL

1. Eggs – Coagulation of egg protein – factor. Egg white foam – effect of beating, sugar, acid and temperature
2. Milk cookery – coagulation of milk protein, paneer
3. Fats and oils – Comparison of smoking temperature of some fats and oils
4. Sugar and Jaggery – different stages of crystallization of sugar

5. Different recipes from fleshy food, egg, milk and milk products
6. Beverages – preparation of stimulating, nourishing and refreshing beverages.
7. Fats and oils – Preparation of shallow and deep fried foods.
8. Sugar Cookery – Preparing recipes at different stages of sugar cookery

### **TEACHING METHODOLOGY**

- Chalk and Board teaching
- Assignments
- Group Discussions
- PPT
- Seminars
- Other Group Activity

### **SYLLABUS DESIGNER:**

1. Mrs. K. GOWTHAMI, Head and Assistant Professor, Department of Foods and Nutrition
2. Ms. S.RANJITHA, Assistant Professor, Department of Foods and Nutrition

### **CLINICAL AND THERAPEUTIC NUTRITION –II**

| <b>Sem</b> | <b>Subject Code</b> | <b>Category</b> | <b>Lecture</b> |              | <b>Tutorial</b> |              | <b>Practical</b> | <b>Credit</b> |
|------------|---------------------|-----------------|----------------|--------------|-----------------|--------------|------------------|---------------|
| II         |                     | Core Paper V    | Hrs/sem        | Hrs/Per week | Hrs/sem         | Hrs/Per week | -----            | 5             |
|            |                     |                 | 135            | 9            | 90              | 6            |                  |               |

### **COURSE OBJECTIVES**

To enable the students to-

- Impart basic knowledge in the field of dietetics.
- Develop capacity and aptitude for taking up dietetics as a profession.
- Study the aetiology, symptoms and medical nutrition therapy in various diseases
- Understand and learn the principles of diet and nutrient modifications for various diseases.

### **COURSE OUTCOMES**

On the successful completion of the course, students will be able to

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| <b>CO1</b>       | Nutrition Management in Diseases of the Liver, Pancreas and Biliary System                   | K2,K3,K4                       |
| <b>CO2</b>       | Nutrition Management of Metabolic Disease-I<br>Nutrition Management of Metabolic Disease- II | K2,K3,K4                       |
| <b>CO3</b>       | Nutrition Management in Coronary Heart Disease (CHD)   | K2,K3,K4                       |
| <b>CO4</b>       | Nutrition Management in Neurologic, Musculo skeletal system and Renal disease                | K2,K3,K4                       |
| <b>CO5</b>       | Nutrition management in common disorders and Nutraceuticals                                  | K2,K3,K4                       |

Knowledge level: K1 – Remember, K2-Understand, K3- Apply, K4-Analyse.

#### **MAPPING WITH PO**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

S-Strong; M-Medium, L- Low

#### **UNIT I**

**(12 HRS)**

##### **Nutrition Management in Diseases of the Liver, Pancreas and Biliary System**

- A. **Pathophysiology of Liver Diseases:** - Progression of Liver Disease Metabolic and Nutritional Implications, Role of Specific Nutrients and Alcohol. Viral Hepatitis, Cirrhosis of Liver, Hepatic Encephalopathy, Wilson's disease. Liver Transplant
- B. **Diseases of Gall Bladder and Pancreas:** - Pathophysiologic Changes, Metabolic and Nutritional Implications. Biliary Dyskinesia, Cholelithiasis, Cholecystitis, Cholecystectomy, Pancreatitis, Zollinger- Ellison Syndrome.

## **UNIT II**

**(12 HRS)**

### **Nutrition Management of Metabolic Disease-I**

- A. Diabetes:** - Prevalence & Classification, Etiology, Physiological symptoms and disturbances Diagnosis & tests used, Complications, Management of Diabetes Mellitus, Nutritional Therapy Diet Plan-Food exchange list, Glycemic Index, CHO counting, Meal planning with and without Insulin. Sweeteners and Sugar Substitutes. Drugs and Insulin, Exercise. **Hypoglycemia:**-classification, symptoms, fasting state hypoglycemia, Postprandial or reactive hypoglycemia, Early alimentary and late reactive hypoglycemia, Idiopathic hypoglycemia, Dietary treatment in reactive hypoglycemia

### **Nutrition Management of Metabolic Disease- II: Gout and Inborn Errors of Metabolism**

- B. Gout:** - Etiology, Symptoms & complication, Management of Diet and Drug, Role of protein & purine
- C. Inborn errors of metabolism:** - PKU, MSUD, Tyrosinemia, Homocystinuria, Glycogen storage Disorder, Galactosemia, Glutaricaciduria and other Types

## **UNIT III**

**(14 HRS)**

### **Nutrition Management in Coronary Heart Disease (CHD)**

Pathogenesis, role of nutrients in prevention: - Metabolic and Nutritional Implications, Dyslipidemias. Coronary Heart Disease (CHD):- Prevalence, Etiology & risk factors, Diagnostic tests and Nutrition management. Common disorders of CHD and Nutrition management: - Dyslipidemias, Atherosclerosis, Hypertension- DASH diet, Ischemic heart disease –Angina, Myocardial Infarction, Congestive Heart failure, Rheumatic Heart Disease

## **UNIT IV**

**(14 HRS)**

### **Nutrition Management in Neurologic, Musculo skeletal system and Renal disease**

**Neurologic Disorders** – Pernicious Anemia, Wernicke-Korsakoff Syndrome, Stroke, Epilepsy, Encephalitis, Meningitis, Alzheimer's disease, Parkinson Disease, Multiple Sclerosis and Attention deficit/ Hyperactivity disorder (ADHD)

**Musculo Skeletal Disorders** - Arthritis, osteoporosis, Rheumatism.

**Diseases of the Renal System** - etiology and pathogenesis - changes in function with progression of diseases, metabolic and nutritional implications, Clinical and metabolic manifestations, Diagnostic test ,Types- Acute and Chronic Nephritis, Nephrotic syndrome , ESRD, Nephrolithiasis –Types and management, Dialysis

## **UNIT V**

**(8 HRS)**

### **a) Nutrition management in other common disorders**

Symptoms, Diagnosis, Therapies and treatment, nutritional implications and Dietary management of Cancer, psoriasis, stress, acne, alcoholism, acidosis, tooth decay, eczema, cataract, Migraine, HIV/AIDS and other sexual disorders.

## **b) Nutraceuticals**

Nutraceuticals and functional Foods –Definition, concept, history and market; Evolution of nutraceuticals and functional foods market. Classification of nutraceuticals and functional foods. Prebiotics, probiotics, symbiotics, Significance and relevance of nutraceuticals and functional foods in the management of diseases and disorders.

## **REFERENCES**

1. Swaminathan S.: Advanced Textbook On Food & Nutrition Vol. 1 & N (2nd Ed. Revised \_ Enlarged) Bapp Co. 1985.
2. Srilakshmi, (2007): Dietetics, published by K.K. Gupta For New age International Pvt. Ltd. New Delhi.
3. Shills and Young. Modern Nutrition In Health And Disease
4. Robinson Ch., M.B. Lawlea, W.L., Chenoweth, And A.E., Carwick : Normal And Therapeutic Nutrition, Macmillan Publishing Company.
5. Mahan L.K., Sylvia Escott-Stump (2000): Krause's Food Nutrition and Diet Therapy 10th Edition, W.B. Saunders Company London.
6. Clinical dietetics and nutrition by F.P Antia and Philip Antia.
7. Davis J. and Sherer, K. (1994): Applied Nutrition and Diet Therapy for Nurses, 2nd edition, W.B. Saunders Co.
8. Sue Rodwell Williams, (1993): Nutrition, Diet Therapy, (7th Ed): W.B. Saunders Company London.
9. Antia F.P. And Philip Abraham (2001) Clinical Nutrition and Dietetics, Oxford Publishing Company.
10. Alfred H.Katz, Prevention and health, the Haworth, Press, New York 1999.
11. Gopalan C., Ram Sastri B.V. And BalSubramaniam S.C., (2006) Nutritive Value of Indian Foods, Hyderabad, National Institute of Nutrition, Indian Council of Medical Research.
12. Raheena M. Begum (1989): A Text Book of Foods Nutrition and Dietetics, Wiley Eastern Ltd., New Delhi.
13. Anderson L., M. V. Dibble, P. R. Turkki, H. S. Mitchell and H. J. Rynbergen Nutrition in Health and Disease, 17th ed., J. B. Lippincott Co., Philadelphia, 1982.
14. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
15. Joshi, S. A.: Nutrition and Dietetics, Tata McGraw Hill, Publications, New Delhi.

16. Krause's Food & the Nutrition Care Process by L. Kathleen Mahan, Janice L Raymond, 14th ed.

### **TEACHING METHODOLOGY**

- ✓ Lecture
- ✓ Active learning methodology
- ✓ Practical
- ✓ Group discussions
- ✓ Seminar
- ✓ Field Visits
- ✓ Assignments

### **CLINICAL AND THERAPEUTIC NUTRITION -II**

| Sem | Subject Code | Category          | Lecture |              | Theory | Practical |              | Credit |
|-----|--------------|-------------------|---------|--------------|--------|-----------|--------------|--------|
| II  |              | Core Practical IV | Hrs/sem | Hrs/Per week | -----  | Hrs/sem   | Hrs/Per week | 4      |
|     |              |                   | 135     | 9            |        | 45        | 3            |        |

1. Diet for obesity and underweight
2. Diet in Cardio Vascular Diseases – Hypertension, Atherosclerosis and Congestive Heart Failure
3. Diet in Kidney Disorders – Nephritis, Nephrosis, Renal failure, dialysis and Urolithiasis
4. Diet in Alzheimer's disease, Stroke and Multiple Sclerosis
5. Diet in Arthritis and Osteoporosis
6. Diet in Cancer, AIDS, Alcoholism and Stress
7. Internship in a teaching hospital for four weeks (20 Marks) – Compulsory
  - a. Identifying patients requiring special diets in the various conditions
  - b. Experience in planning and calculating any six modified diets
  - c. Supervising food preparation, portioning and services in the dietary department
  - d. Case study selecting and observing one patient on a therapeutic diet in relation to patient's history, income, occupation habits and social factors – calculating the diet according medical prescription accompanying the doctor while visiting patient and counseling the patient.

**SYLLABUS DESIGNER:**

1. Mrs. K. GOWTHAMI, Head And Assistant Professor, Department of Foods and Nutrition
2. Dr. R. DURGADEVI, Assistant Professor, Department of Foods and Nutrition

**ADVANCED NUTRITIONAL SCIENCE**

| Sem | Subject Code | Category     | Lecture |              | Theory  |              | Practicals | Credit |
|-----|--------------|--------------|---------|--------------|---------|--------------|------------|--------|
| I   |              | Core paper I | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | -----      | 4      |
|     |              |              | 135     | 9            | 90      | 6            |            |        |

**COURSE OBJECTIVE:**

- 1) To highlight the physiological and metabolic role of nutrients and their relationship to human health and wellbeing.
- 2) To understand the health problems associated with nutrient deficiency or toxicity

**COURSE OUTCOMES**

On the successful completion of the course, students will be able to

| CO Number  | CO Statement   | Knowledge Level (K1-K4) |
|------------|--|-------------------------|
| <b>CO1</b> | Understanding the concept of Carbohydrates and Dietary fibre   | k2                      |
| <b>CO2</b> | Learning about the lipids, proteins and amino acids  | k2                      |
| <b>CO3</b> | Learning about the micronutrients and detoxification   | k2                      |
| <b>CO4</b> | Understanding the importance of fluids, acid-base balance and phytochemicals   | k2                      |
| <b>CO5</b> | To get an insight into interrelationships between various metabolic pathways. To become proficient for specialization in nutrition | K3, k4                  |

Knowledge level: K1 – Remember, K2-Understand, K3- Apply, K4-Analyse.



## MAPPING WITH PO

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | M          | S          |
| <b>CO2</b> | S          | S          | M          | S          | S          |
| <b>CO3</b> | S          | S          | M          | M          | M          |
| <b>CO4</b> | S          | M          | S          | M          | S          |
| <b>CO5</b> | M          | S          | S          | S          | M          |

S-Strong; M-Medium, L- Low

### UNIT- I

(13 HRS)

#### METABOLISM OF MAJOR NUTRIENT - CARBOHYDRATES

- Biological Membranes and Transport. Carbohydrates- Definition, classification, functions, maintenance of blood sugar levels, requirement, sources, digestion and absorption, Metabolism.
- Definition of Glycolysis, glycogenesis, glycogenolysis and gluconeogenesis. Elementary knowledge of biosynthesis of protein Electron transport chain and oxidative phosphorylation. Bioenergetics.
- Dietary fiber- Definition, classification, physiological effects and sources..

### UNIT- II

(20 HRS)

#### METABOLISM OF OTHER MACRONUTRIENT – LIPIDS, PROTEIN, AMINO ACIDS

- Lipids- Definition, classification functions, sources, requirements, digestion and absorption. Essential fatty acids – Definition, functions, sources and effects of deficiency. Cholesterol metabolism. Definitions- Ketone bodies, ketogenesis and ketosis.
- Proteins- Definition, composition, nutritional classification of proteins and amino acids, functions, sources, requirements, digestion and absorption. Evaluation of protein quality: PER, BV, NPU and Chemical score.
- Amino acids- Types, Definition - deamination, transamination and decarboxylation. Urea production. Enzymes and co-enzymes- Definition, types, classification and factors affecting velocity of enzyme catalyzed reactions. BCAA and other Amino Acid Pool.

### UNIT- III

(18 HRS)

#### VITAMINS, MINERALS, SUPPLEMENTS, DETOXIFICATION

- Regulatory nutrients – Water and Fat Soluble Vitamins. Macro, Micro and Trace minerals- Sources, Digestion, Absorption, Transport, and Storage Functions and Mechanisms of Action, Metabolism and Excretion, RDA, Deficiency and Toxicity.

- Health and nutrient claims in food and dietary Supplement. Detoxification – Xenobiotics, enzyme systems involved mechanism of detoxification.

#### **UNIT- IV**

**(20 HRS)**

##### **FLUIDS AND PHYTOCHEMICALS**

- Water: Body composition – extra- and intra- cellular fluid; Physiological functions; water balance and its regulation; Requirement and the sources; Nutritional and health problems due to deficiency or excess of water intake.
- Acid – base balance: Acid-base balance in normal health, definition of buffers, principles of buffers, major sources of acid produced in the body, physiological buffer system and role of different buffersystems.
- Phytochemicals: Non nutritive food components and their potential health benefits: polyphenols, tannins, phytate, phytoestrogens, cyanogenic compounds, lectins and saponins.

#### **UNIT- V**

**(19 HRS)**

##### **INTERRELATIONSHIP BETWEEN NUTRIENTS AND ANTIOXIDANTS**

- Oxidative stress and antioxidants – Free radicals – definition, formation in biological systems, defense against free radicals. Role of free radicals and antioxidants in health and disease Determination of free radicals, lipid peroxides and antioxidants
- Regulation of metabolism – Interrelationship of carbohydrate, protein and lipid metabolism, Role of Vitamins and Minerals in Metabolism, metabolic adaptation during starvation, exercise, stress and diabetes mellitus

#### **TEXT BOOKS:**

| <b>S.NO</b> | <b>AUTHORS</b>                  | <b>TITLE</b>                | <b>PUBLISHERS</b>                                      | <b>YEAR OF PUBLICATION</b> |
|-------------|---------------------------------|-----------------------------|--|----------------------------|
| <b>1</b>    | Srilakshmi, B.                  | Food Science                | New Age International (P) Ltd., Publishers, New Delhi. | 2005                       |
| <b>2</b>    | Potter, N. and Hotch Kiss, J.H. | Food Science, Fifth edition | CBS Publishers and Distributors, New Delhi             | 1996                       |
| <b>3</b>    | Srilakshmi                      | Nutrition Science           | New Age International Pvt. Ltd, New                    | 2008                       |

|          |                                      |                             |                                       |      |
|----------|--------------------------------------|-----------------------------|---------------------------------------|------|
|          |                                      |                             | Delhi.                                |      |
| <b>4</b> | Bamji, M.S., Rao, P.N. and Reddy, V. | Textbook of Human Nutrition | Oxford & IBH Publishing Co. Pvt. Ltd. | 1996 |
| <b>5</b> | Gibney and Michael.J                 | Nutrition Metabolism.       | Blackwell Publishing.USA.             | 2003 |

#### REFERENCE BOOKS:

| <b>S.NO</b> | <b>AUTHORS</b>                                | <b>TITLE</b>  | <b>PUBLISHERS</b>                            | <b>YEAR OF PUBLICATION</b> |
|-------------|---|---|--|----------------------------|
| <b>1</b>    | Mahan L K and Escott – Stump S                | Krause’s Food Nutrition and Diet Therapy 10th Edition                     | WB Saunders Ltd                              | 2000                       |
| <b>2</b>    | Gopalan, C                                    | Recent Trends in Nutrition  | Oxford University Press, London.             | 1995                       |
| <b>3</b>    | AmbikaShanmugam                               | Fundamentals of biochemistry for Medical students 7 <sup>th</sup> Edition | KarthikPprinters                             | 1992                       |
| <b>4</b>    | U.Sathyanarayana and U.Chakrabani             | Biochemistry, Third Edition   | Uppala- Author Publishers                    | 2007                       |
| <b>5</b>    | Shils, M.E., Olson, J., Shike, M. and Roos, C | Modern Nutrition in Health and Disease, 9th edition                       | Williams and Williams. A Beverly Co. London. | 2006                       |
| <b>6</b>    | Carolyn D. Berdanier, Janos Zemleni           | Advanced Nutrition Macronutrients, Micronutrients and metabolism.         | CRC Press Taylor & Francis Group, LLC        | 2009                       |
| <b>7</b>    | Bender and David                              | Introduction to nutrition and metabolism, 4th edition                     | CRC Press. USA.                              | 2008                       |
| <b>8</b>    | Geissler and Catherine                        | Human   | Elsevier. UK.                                | 2007                       |

|           |                     |  |                              |      |
|-----------|---------------------|--|------------------------------|------|
|           |                     | Nutrition, 11th edition                    |                              |      |
| <b>9</b>  | Mann and Jim        | Essentials of Human Nutrition, 3rd edition | Oxford University Press. UK. | 2008 |
| <b>10</b> | Eastwood and Martin | Principles of Human Nutrition              | Blackwell Publishing. USA.   | 2003 |

#### WEB SOURCES:

1. <http://www.malecentrum.sk/data/att/166373.pdf>
2. <https://www.docsity.com/en/lecture-notes/subjects/food-science-and-technology/>
3. <https://www.coursehero.com/file/7062362/Advanced-Nutrition-Notes-Ch-1-3/>

#### TEACHING METHODOLOGY

- Chalk and board teaching
- Study Assignment method
- Active learning method
- Group discussions
- PPT
- Seminars
- Other Group activity

#### SYLLABUS DESIGNER:

1. Mrs. K. GOWTHAMI, Head And Assistant Professor, Department of Foods and Nutrition
2. Dr. R. DURGADEVI, Assistant Professor, Department of Foods and Nutrition
3. Ms. S.M. SURUTHIKEERTHI, Assistant Professor, Department of Foods and Nutrition

#### FOOD MICROBIOLOGY

| Sem | Subject Code | Category          | Lecture |              | Theory  |              | Credit |
|-----|--------------|-------------------|---------|--------------|---------|--------------|--------|
| II  |              | Elective Paper II | Hrs/sem | Hrs/Per week | Hrs/sem | Hrs/Per week | 3      |
|     |              |                   | 90      | 6            | 90      | 6            |        |

**COURSE OBJECTIVE:**

The students will be able to

1. Learn about the morphology of different microorganisms.
2. Study the spoilage caused by microorganisms.
3. Understand the various types of poisoning and infection caused by microorganism.

**COURSE OUTCOMES**

On the successful completion of the course, students will be able to

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K1-K4)</b> |
|------------------|---|--------------------------------|
| <b>CO1</b>       | Introduction and classification of Microorganisms                     | k2                             |
| <b>CO2</b>       | Food spoilage due to Microbes   | k2                             |
| <b>CO3</b>       | Analyzing and Identifying the Food borne diseases and its ill effects | K3                             |
| <b>CO4</b>       | Analyzing the Preventive Measures to Control the Microbes             | k2                             |
| <b>CO5</b>       | Analyzing different Microbial tests and treatments.                   | K3, k4                         |

Knowledge level: K1 – Remember, K2-Understand, K3- Apply, K4-Analyse.

**MAPPING WITH PO**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | M          | S          | M          |
| <b>CO2</b> | M          | M          | M          | M          | S          |
| <b>CO3</b> | S          | S          | M          | M          | M          |
| <b>CO4</b> | M          | M          | S          | M          | M          |
| <b>CO5</b> | M          | S          | S          | S          | S          |

S-Strong; M-Medium, L- Low

**UNIT – I INTRODUCTION TO MICROORGANISMS**

**(15 HRS)**

Classification of microorganism, morphology of yeast, mould, bacteria, virus, algae and protozoa.

**UNIT – II FOOD SPOILAGE****(15 HRS)**

General principles underlying spoilage of food, fitness and unfitness of food for consumption, contamination and spoilage of nonperishable and perishable foods.

**UNIT – III FOOD BORNE DISEASES****(15 HRS)** Food

in relation to disease- food borne disease, food infection, intoxication, microbial toxins- types, bacterial poisoning and infection- causative agents and sources, symptoms and prevention of Staphylococcal food poisoning, botulism, salmonella, bacillus infection, E.coli, food poisoning of fungal origin- ergotism, aflatoxin.

**UNIT – IV CONTROL OF MICROORGANISM****(15 HRS)**

Principles of preservation, preservation by high and low temperature, chemical preservatives, salt sugar as preservatives, new trends in preservation.

**UNIT – V MICROBIOLOGICAL TESTING****(15 HRS)**

Sterilization by Physical agents-Heat, moist heat, fractional sterilization, pasteurization, other types of sterilization, chemical sterilization. Microbiology of water, typical organisms in water, types of bacterial examination for water, water treatment.

**REFERENCE BOOKS:**

- ✓ Food Microbiology-Adams, M.R. and Moss M.O
- ✓ Foundations in Microbiology – Kathleen Talaro and Arthur Talalo.
- ✓ Industrial Microbiology –Patel, H.P.
- ✓ Industrial Microbiology – Casida.
- ✓ Industrial Microbiology – Prescott and Dunn
- ✓ Microbiology –Concepts and Applications – Pau IA. Ketchum.
- ✓ Microbiology -Concepts and Applications – McKane and Kandel.
- ✓ Bergeys Manual of Determinative Bacteriology- IX Edition.

**TEACHING METHODOLOGY**

- Chalk and Board teaching
- Assignments
- Group Discussions
- PPT
- Seminars
- Other Group Activity

## **DEPARTMENT OF COMPUTER SCIENCE**

### **PROGRAMME EDUCATIONAL OBJECTIVES**

**PEO1:** Graduates will have skills and knowledge to excel in their professional career in Computer Science and its related disciplines.

**PEO2:** Graduates will be ethically and socially responsible solution providers in Computer Science and successfully pursue higher education in reputed institutions.

### **PROGRAMME OUTCOME**

**PO1:Problem Analysis:** To identify, formulate and analyze complex Computer Science and Applications problems in the areas of hardware, software, theoretical Computer Science to reach significant conclusions by applying Mathematics, Natural sciences, Accounts, Computer Science and Applications principles.

**PO2:Design & Development of Solutions:** To design and build a system, component, process or a program for complex problems by factoring in all the requirements and various design tradeoffs, with appropriate consideration for the public health and safety, cultural, social and environmental factors

**PO3:Modern Tool Usage:** To create, select and apply state of the art tools and techniques in designing, developing and testing a computing system or its component.

**PO4:Ethics:** To apply professional ethics and cyber regulations, responsibilities and pledge to the norms of professional computing practice.

**PO5:Environment and Sustainability:** To demonstrate the knowledge of sustainable development of computing systems/products/solutions with an understanding of the impact of these solutions on the Society and Environment.

**PO6:Life-long Learning:** To spot the need for and engage in lifelong learning to cope up with the rapidly evolving disciplines of Computer Science and applications domains.

## DEPARTMENT OF B.Sc., COMPUTER SCIENCE

### The course of study and scheme of Examination

#### SEMESTER- I

| SN<br>O | PART | COURSE<br>TITLE   |             | Ins<br>/H<br>rs | Cr<br>ed<br>it | Title of the<br>paper                    | MAXIMUN MARKS |              |       |
|---------|------|-------------------|-------------|-----------------|----------------|--|---------------|--------------|-------|
|         |      |                   |             |                 |                |  | CI<br>A       | UNI.<br>EXAM | TOTAL |
| 1       | I    | Language          | Paper-1     | 6               | 4              | Language                                 | 25            | 75           | 100   |
| 2       | II   | English           | Paper-1     | 6               | 4              | Foundation<br>English-I                  | 25            | 75           | 100   |
| 3       | III  | Core(T)           | Paper-1     | 7               | 4              | Digital Logic and<br>Programming in<br>C | 25            | 75           | 100   |
| 4       | IV   | Core<br>Practical | Practical 1 | 3               | 3              | Programming in<br>C                      | 40            | 60           | 100   |
| 5       | V    | Allied            | Paper-1     | 6               | 5              | Mathematics I                            | 25            | 75           | 100   |
| 6       | VI   | EVS               |             | 2               | 2              | EVS                                      | 25            | 75           | 100   |
|         |      | TOTAL             |             | 30              | 22             |  | 165           | 435          | 600   |

#### SEMESTER II

| SN<br>O | PART | COURSE<br>TITLE |         | Ins<br>/H<br>rs | Cr<br>ed<br>it | Title of the<br>paper    | CI<br>A | UNI.<br>EXAM | TOTAL |
|---------|------|-----------------|---------|-----------------|----------------|--------------------------|---------|--------------|-------|
| 7       | I    | Language        | Paper-2 | 6               | 4              | Language                 | 25      | 75           | 100   |
| 8       | II   | English         | Paper-2 | 4               | 4              | Foundation<br>English-II | 25      | 75           | 100   |
| 9       | III  | Core(T)         | Paper-2 | 6               | 4              | C++ and Data             | 25      | 75           | 100   |



|    |     |                |             |           |           |   |            |            |            |
|----|-----|----------------|-------------|-----------|-----------|---|------------|------------|------------|
|    |     |                |             |           |           | Structure                               |            |            |            |
| 10 | III | Core practical | Practical-2 | 3         | 3         | C++ and Data Structure                  | 40         | 60         | 100        |
| 11 | III | Allied         | Paper-2     | 6         | 5         | Mathematics II                          | 25         | 75         | 100        |
| 12 | III | VE             |             | 3         | 2         | VE                                      | -          | 50         | 50         |
| 13 | IV  | Soft skill     |             | 2         | 1         | Soft skill for Linguistic Communication | -          | 50         | 50         |
|    |     | <b>TOTAL</b>   |             | <b>30</b> | <b>23</b> |   | <b>140</b> | <b>460</b> | <b>600</b> |

### **SEMESTER III**

| <b>SN O</b> | <b>PART</b> | <b>COURSE TITLE</b> |             | <b>Ins/Hrs</b> | <b>Credit</b> | <b>Title of the paper</b>                  | <b>CIA</b> | <b>UNI. EXAM</b> | <b>TOTAL</b> |
|-------------|-------------|---------------------|-------------|----------------|---------------|--|------------|------------------|--------------|
| 14          | I           | Language            | Paper-3     | 6              | 4             | Language                                   | 25         | 75               | 100          |
| 15          | II          | English             | Paper-3     | 6              | 4             | Foundation English-III                     | 25         | 75               | 100          |
| 16          | III         | Core(T)             | Paper-3     | 5              | 4             | Visual Programming and DBMS                | 25         | 75               | 100          |
| 17          | III         | Core Practical      | Practical-3 | 3              | 3             | Visual Programming and DBMS                | 40         | 60               | 100          |
| 18          | III         | Allied              | Paper-3     | 6              | 5             | Statistical Methods and their applications | 25         | 75               | 100          |
| 19          | IV          | Skilled Based       | Practical 1 | 2              | 2             | Open Source Software                       | -          | 50               | 50           |
| 20          | IV          | Non major           | Paper-1     | 2              | 2             | Introduction to Information Technology     | -          | 50               | 50           |

|   |     |                   |                 |    |    |   |     |                  |       |
|---|-----|-------------------|-----------------|----|----|---|-----|------------------|-------|
|   |     | TOTAL             |                 | 30 | 24 |   | 140 | 460              | 600   |
| <i>SEMESTER –IV</i>   |     |                   |                 |    |    |   |     |                  |       |
|   |     |                   |                 |    |    |   | CIA | UNI.<br>EXA<br>M | TOTAL |
| 21  | I   | Language          | Paper-4         | 6  | 4  | Language  | 25  | 75               | 100   |
| 22  | II  | English           | Paper-4         | 6  | 4  | Foundation<br>English -IV                           | 25  | 75               | 100   |
| 23  | III | Core(T)           | Paper-4         | 5  | 4  | ASP.net   | 25  | 75               | 100   |
| 24  | III | Core<br>practical | Practic<br>al-4 | 3  | 3  | ASP.net   | 40  | 60               | 100   |
| 25  | III | Allied            | Paper-4         | 6  | 5  | Statistical<br>Methods and<br>their<br>applications | 25  | 75               | 100   |
| 26  | III | Skill<br>based    | Practic<br>al-2 | 2  | 2  | Microprocessor                                      | -   | 50               | 50    |
| 27  | IV  | Non-<br>Major     | Paper-2         | 2  | 2  | Internet and its<br>Applications                    | -   | 50               | 50    |
|   |     | TOTAL             |                 | 30 | 24 |   | 140 | 460              | 600   |
| Internship Training Program during summer vocation with an extra credit = 1 |     |                   |                 |    |    |   |     |                  |       |

| <b>SEMESTER- V</b> |      |                   |                 |                     |                |                              |     |              |       |
|--------------------|------|-------------------|-----------------|---------------------|----------------|------------------------------|-----|--------------|-------|
| SN<br>O            | PART | COURSE<br>TITLE   |                 | In<br>s/<br>Hr<br>s | Cr<br>edi<br>t | Title of the paper           | CIA | UNI.<br>EXAM | TOTAL |
| 28                 | III  | Core (T)          | Paper-5         | 6                   | 4              | Advanced Java<br>Programming | 25  | 75           | 100   |
| 29                 | III  | Core (T)          | Paper-6         | 6                   | 4              | Programming with<br>Python   | 25  | 75           | 100   |
| 30                 | III  | Core<br>practical | Practical-<br>5 | 3                   | 3              | Advanced Java<br>Programming | 40  | 60           | 100   |

|    |     |                |              |    |    |  |     |     |     |
|----|-----|----------------|--------------|----|----|--|-----|-----|-----|
| 31 | III | Core practical | Practical-6  | 3  | 3  | Programming with Python  | 40  | 60  | 100 |
| 32 | III | Elective-I     | Paper-1      | 5  | 3  | 1. Operating System<br>2. Computer Graphics                          | 25  | 75  | 100 |
| 33 | III | Elective-II    | Paper-2      | 5  | 3  | 1. Data Communication and Networking.<br>2. Digital Image Processing | 25  | 75  | 100 |
| 34 | IV  | Skill Based    | Practical-31 | 2  | 2  | Operating System Lab   | -   | 50  | 50  |
|    |     | TOTAL          |              | 30 | 22 |  | 180 | 470 | 650 |

*SEMESTER –VI*

|    |     |                |             |   |   |   | CIA | UNI. EXAM | TOTAL |
|----|-----|----------------|-------------|---|---|---|-----|-----------|-------|
| 35 | III | Core (T)       | Paper-7     | 6 | 4 | Android Programming   | 25  | 75        | 100   |
| 36 | III | Core (T)       | Paper-8     | 6 | 4 | Cloud Computing   | 25  | 75        | 100   |
| 37 | III | Core practical | Practical-7 | 3 | 3 | Android Programming   | 40  | 60        | 100   |
| 38 | III | Core practical | Practical-8 | 3 | 3 | Cloud Computing   | 40  | 60        | 100   |
| 39 | III | Elective III   | Paper-3     | 5 | 3 | 1. Software Engineering<br>2. E-Commerce                    | 25  | 75        | 100   |
| 40 | III | Elective IV    | Paper-4     | 5 | 3 | 1. Design and analysis of Algorithms<br>2. Computer Network | 25  | 75        | 100   |

|  |    |                    |             |    |    |            |     |     |     |
|--|----|--------------------|-------------|----|----|------------|-----|-----|-----|
| 41   | IV | Skill Based        | Practical-4 | 2  | 2  | Multimedia | -   | 50  | 50  |
| 42   |    | Extension activity |             | -  | 3  |            | 100 | -   | 100 |
|  |    | TOTAL              |             | 30 | 25 |            | 280 | 470 | 750 |
| Mini Project during summer vocation with an extra credit = 2 |    |                    |             |    |    |            |     |     |     |

### B.Sc [COMPUTER SCIENCE]

| PART     | SUBJECT                               | PAPERS | CREDITS | TOTAL CREDITS | MARKS | TOTAL MARKS |
|----------|---------------------------------------|--------|---------|---------------|-------|-------------|
| Part I   | Languages                             | 4      | 4       | 16            | 100   | 400         |
| Part II  | English                               | 4      | 4       | 16            | 100   | 400         |
| Part III | Allied                                | 4      | 5       | 20            | 100   | 400         |
| Part III | Elective                              | 4      | 3       | 12            | 100   | 400         |
| Part III | Core                                  | 8      | 4       | 32            | 100   | 800         |
| Part III | Core Practical                        | 8      | 3       | 24            | 100   | 800         |
| Part IV  | EVS                                   | 1      | 2       | 2             | 100   | 100         |
| Part IV  | Value Education                       | 1      | 2       | 2             | 50    | 50          |
| Part IV  | Skill Based (Theory-1, Practical-1-3) | 4      | 2       | 8             | 50    | 200         |
| Part IV  | Non-Major                             | 2      | 2       | 4             | 50    | 100         |

|         |                      |    |   |     |     |      |
|---------|----------------------|----|---|-----|-----|------|
| Part IV | Soft Skill           | 1  | 1 | 1   | 50  | 50   |
| Part V  | Extension Activities |    | 3 | 3   | 100 | 100  |
|         | Total                | 41 |   | 140 |     | 3800 |

### DIGITAL LOGIC AND PROGRAMMING IN C

| Semester | Subject Code | Category       | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|----------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |                | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE PAPER - 1 | 7           | 105     | 7          | 105     | 0         | 0       | 4       |

### COURSE OBJECTIVE

- This paper develops the basics concept used in design and analysis of digital systems and to develop the programming skills using C Language.

### COURSE OUTCOME

On the successful completion of the course, students will be able to

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | Learn the basic concepts of digital logic Circuits and Boolean Algebra Concept. | K1                      |
| CO2       | Understand about Combinational and sequential circuits.                         | K2                      |
| CO3       | Learn the fundamental concept of C Programming language.                        | K1                      |
| CO4       | To implement Array, Functions and structures                                    | K2                      |
| CO5       | To create files & pointers and apply its operations in program.                 | K3                      |

Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze

### MAPPING WITH PROGRAMME OUTCOME

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | S   | S   | M   |
| CO2 | S   | S   | S   | M   | M   | S   |
| CO3 | S   | S   | M   | S   | M   | M   |
| CO4 | S   | S   | S   | M   | S   | S   |
| CO5 | S   | S   | M   | S   | M   | S   |

*S-Strong*

*M-Medium*

*L-Low*

### SYLLABUS

#### UNIT I: NUMBER SYSTEMS AND BOOLEAN ALGEBRA

**23 Hrs**

**NUMBER SYSTEMS:** Decimal - Binary - Octal - Hexadecimal - Number Base Conversions – Complements - 1's Complement - 2's complement - 9's Complement – 10's Complements - binary Codes - BCD – Excess-3 - Gray code.

**BOOLEAN ALGEBRA:** Definition of Boolean algebra – Theorems of Boolean algebra - Boolean Functions – Digital Logic gates and Truth Table.

**SIMPLIFICATION OF BOOLEAN FUNCTIONS:** The Map Method – Two Variable Map - Three Variable Map - Four Variable Map - Don't Care Conditions – Product of Sums Simplification.

#### UNIT-II: COMBINATIONAL AND SEQUENTIAL CIRCUITS

**19 Hrs**

**COMBINATIONAL LOGIC:** Adders - Sub tractors – multiplexers - de-multiplexers – encoders – decoders.

**SEQUENTIAL LOGIC:** Flip flops: Basic Flip flop - Clocked RS Flip flop – D Flip flop – JK Flip flop – T Flip flop - Triggering of Flip Flops: Master Slave.

**REGISTERS AND COUNTERS:** Registers - 4 bit Register - Ripple Counter.

#### UNIT -III: C BASICS AND CONTROL CONSTRUCTS

**21 Hrs**

C fundamentals- Keywords - Variables – Data types - Operators- Constants- Expression – Library Functions- Decision making branching and looping – continue - break

#### UNIT IV: ARRAYS, FUNCTIONS AND STRUCTURES

**21 Hrs**

Arrays-Multi dimensional arrays- String- User defined functions- Call by Value and reference-Recursion- Storage classes- Structures and Union

**UNIT – V: POINTERS AND FILES****21 Hrs**

Pointers- Pointer operations and Arithmetic- File management in C : File opening and closing- I/O operations on files - Error handling during I/O operations - Random access to files - Command line arguments

**Distribution of Marks: Theory :70% and Problems:30%**

**TEXT BOOKS**

| S.No | Authors          | Title                              | Publishers          | Year of Publication |
|------|------------------|------------------------------------|---------------------|---------------------|
| 1.   | Morris Mono M.   | “Digital Logic and Computer Design | PHI Latest Pub. Ed. | 2007                |
| 2    | Balaguruswamay.E | Programming in ANSI C              | TMH                 | 2012                |

**REFERENCE BOOKS**

| S.No | Authors                                | Title                               | Publishers | Year of Publication |
|------|--|-------------------------------------|------------|---------------------|
| 1.   | Albert Paul Malvino,<br>Donald P Leach | Digital principles and applications | TMH        | 1996.               |

**WEB RESOURCES**

1. [https://www.electronics-tutorials.ws/logic/logic\\_1.html](https://www.electronics-tutorials.ws/logic/logic_1.html)
2. <https://www.programiz.com/c-programming/>
3. <https://www.geeksforgeeks.org/c-language-set-1-introduction/>

**TEACHING METHODOLOGY**

- Class room teaching
- Group discussions
- Seminars
- Chart/Assignment
- Simulation Model
- Smart Class room

**SYLLABUS DESIGNERS**

1. Ms. A. SIVASANKARI, HOD, Dept of Computer Science
2. Mrs.R.SHOBANA, Assistant Professor, Dept of Computer Applications
3. Mrs.B.ARULMOZHI , HOD, Dept of Computer Applications

## PROGRAMMING IN C

| Semester | Subject Code | Category     | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|--------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |              | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE PRACT-I | 3           | 45      | 0          | 0       | 3         | 45      | 3       |

## COURSE OBJECTIVE

- This practical develops the basic programming skills in C Language.

## SYLLABUS

1. Summation of Series:  $\sin(x)$  (Compare with built in functions)
2. Summation of Series  $\cos(x)$  (Compare with built in functions)
3. Counting the no. of vowels, consonants, words, white spaces in a line of text
4. Reverse a string & check for palindrome without built in string function
5.  ${}^n P_r$ ,  ${}^n C_r$  in a single program using function
6. Matrix Addition, subtraction and multiplication
7. Linear Search of a number in an array
8. Sorting an array in ascending and descending order
9. Finding maximum and minimum of list of numbers
10. Call by value and call by reference of functions
11. Employee pay bill using structure
12. Preparing an EB bill using file

**Distribution of Marks: Program Output with Viva voce: 85% and Record:15%**

## SYLLABUS DESIGNERS

1. Ms. A. SIVASANKARI, HOD, Dept of Computer Science
2. Mrs.R.SHOBANA, Assistant Professor, Dept of B Computer Applications
3. Mrs.B.ARULMOZHI , HOD, Dept of Computer Applications



## C++ AND DATA STRUCTURE

| Semester | Subject Code | Category      | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|---------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |               | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| II       |              | CORE PAPER-II | 6           | 90      | 6          | 90      | 0         | 0       | 4       |

### COURSE OBJECTIVE

- This paper helps the students to quickly move into the world of C++ with Object Oriented Programming and Data structure concept.

### COURSE OUTCOME

On the successful completion of the course, students will be able to

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To learn the Basic Concept of Object Oriented Programming Language.               | K1                      |
| CO2       | To understand how to implement OOPs Concept in C++.                               | K2                      |
| CO3       | Understanding the Data Structure Concept  | K2                      |
| CO4       | To develop the algorithms for various data structure operations and applications. | K3                      |
| CO5       | To pertain the data in trees and Graphs.  | K4                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

### MAPPING WITH PROGRAMME OUTCOME

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | M   | M   |
| CO2 | S   | S   | S   | S   | M   | S   |
| CO3 | S   | M   | S   | S   | M   | M   |
| CO4 | S   | S   | S   | M   | S   | S   |
| CO5 | S   | S   | S   | M   | M   | S   |

*S-Strong*

*M-Medium*

*L-Low*

## **SYLLABUS**

### **UNIT I – BASICS OF OOP'S and C++**

**18 Hrs**

Basic Concepts of OOP - Benefits of OOP - Applications of OOP- Introduction to C++ - Streams Classes & Member functions of stream class - manipulators - I/O in C++ -Formatted & - Unformatted Console I/O Operations.

### **UNIT II – CLASSES AND OBJECTS AND FILE OPERATIONS 19 Hrs**

Classes and Objects - Constructors and Destructors - Types of Constructors - Defining member functions - Inline function - Friend function- Function Overloading - Operator overloading - Inheritance - Types of Inheritance - Virtual Functions and Polymorphism. Files-File operations.

### **UNIT III – BASICS OF DATA STRUCTURES 18 Hrs**

Definition of Data structure – Primitive and Composite data types – Arrays, Operations on Arrays - Stack – Operations on stack – Infix to Post fix Conversion - Queue – Operations on Queue – Circular Queues.

### **UNIT IV -COMPOSITE DATA STRUCTURES 17 Hrs**

Singly Linked List – Operations, - Doubly Linked List – Operations – Sorting and Searching.

### **UNIT V –TREES AND GRAPHS 18 Hrs**

Trees and Graphs: Binary Trees - Operations - Tree Traversals- Recursive In order, Preorder, Post order - Graph - Definition, Types of Graphs - Graph Traversal – DFS & BFS

**Distribution of Marks: Theory :80% and Problems:20%**

## **TEXT BOOKS**

| <b>S.No</b> | <b>Authors</b>  | <b>Title</b>                         | <b>Publishers</b>   | <b>Year of Publication</b> |
|-------------|-----------------|--------------------------------------|---------------------|----------------------------|
| 1.          | E. Balagurusamy | Object Oriented Programming with C++ | Tata McGraw Hill    | 1995                       |
| 2.          | Nell Dale       | C++ with Data structure              | Narosa Publications | 2000                       |

## **REFERENCE BOOKS**

| S.No | Authors         | Title                                | Publishers              | Year of Publication |
|------|-----------------|--------------------------------------|-------------------------|---------------------|
| 1.   | Reema Thareja   | Object Oriented Programming with C++ | Oxford University Press | 2015                |
| 2.   | Varsha H. Patil | Data Structures using C++            | Oxford University Press | 2012                |

## WEB RESOURCES

1. <https://www.tutorialspoint.com/cplusplus/>
2. <https://www.guru99.com/cpp-tutorial.html>
3. [https://www.tutorialspoint.com/data\\_structures\\_algorithms/](https://www.tutorialspoint.com/data_structures_algorithms/)

## TEACHING METHODOLOGY

- Class room teaching
- Group discussions and Seminars
- Chart/Assignment
- Simulation Model

| Semester | Subject Code | Category           | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|--------------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |                    | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| II       |              | CORE PRACTICAL – 2 | 3           | 45      | 0          | 0       | 45        | 45      | 3       |

- Smart Class room

## SYLLABUS DESIGNERS

1. Ms. A.SIVASANKARI, HOD, Dept of Computer Science
2. Mrs P.SIVAGAMI, Assistant Professor, Dept of Computer Science
3. Mrs. B.ARULMOZHI , HOD, Dept of Computer Applications

## C++ AND DATA STRUCTURE

## COURSE OBJECTIVE

- This practical help us to develops the Object Oriented Programming Concept using C++ and Data Structure.

### **C++ CONCEPTS**

1. Operator Overloading
2. Friend function
3. Inheritance
4. Polymorphism
5. Files

### **DATA STRUCTURE**

1. Implement PUSH, POP operations of stack using Arrays
2. Implement add, delete operations of queue using Pointers
3. Conversions of infix to postfix using stack operations
4. Addition of two polynomials using Arrays
5. Binary tree traversals [in-order, pre-order, and post-order] using linked list.
6. Depth First Search and Breadth first Search for Graphs.

**Distribution of Marks: Program Output with Viva voce: 85% and Record: 15%**

### **SYLLABUS DESIGNERS**

1. Ms. A.SIVASANKARI, HOD, Dept of Computer Science
2. Mrs P.SIVAGAMI, Assistant Professor, Dept of Computer Science
3. Mrs. B.ARULMOZHI , HOD, Dept of Computer ApplicationsLABUS

## **DEPARTMENT OF COMPUTER APPLICATIONS**

### **PROGRAMME EDUCATIONAL OBJECTIVES**

**PEO1:** Graduates will have skills and knowledge to excel in their professional career in Computer Applications and its related disciplines.

**PEO2:** Graduates will be ethically and socially responsible solution providers in Computer Applications and successfully pursue higher education in reputed institutions.

### **PROGRAMME OUTCOME**

**PO1: Problem Analysis:** To identify, formulate and analyze complex Computer Science and Applications problems in the areas of hardware, software, theoretical Computer Science to reach significant conclusions by applying Mathematics, Natural sciences, Accounts, Computer Science and Applications principles.

**PO2:Design & Development of Solutions:** To design and build a system, component, process or a program for complex problems by factoring in all the requirements and various design tradeoffs, with appropriate consideration for the public health and safety, cultural, social and environmental factors

**PO3: Modern Tool Usage:** To create, select and apply models and techniques in designing, developing and testing a computing system or its component.

**PO4: Ethics:** To apply Business and professional ethics and cyber regulations, responsibilities and pledge to the norms of professional computing practice.

**PO5: Environment and Sustainability:** To demonstrate the knowledge of sustainable development of computing systems/products/solutions with an understanding of the impact of these solutions on the Society and Environment.

**PO6: Life-long Learning:** To spot the need for and engage in lifelong learning to cope up with the rapidly evolving disciplines of Computer Science and applications domains.

## DEPARTMENT OF B.C.A, COMPUTER APPLICATIONS

### SEMESTER- I

| S.NO | PART | COURSE TITLE      |             | Ins /H rs | Cr edi t | Title of the paper                 | MAXIMUM MARKS |            |        |
|------|------|-------------------|-------------|-----------|----------|------------------------------------|---------------|------------|--------|
|      |      |                   |             |           |          |                                    | CIA           | UNI. EXA M | TOT AL |
| 1    | I    | Language          | Paper-1     | 6         | 4        | Language                           | 25            | 75         | 100    |
| 2    | II   | English           | Paper-1     | 6         | 4        | Foundation English-I               | 25            | 75         | 100    |
| 3    | III  | Core (T)          | Paper-1     | 7         | 4        | Digital Logic and Programming in C | 25            | 75         | 100    |
| 4    | III  | Core (Practical ) | Practical-1 | 3         | 3        | Programming in C                   | 40            | 60         | 100    |
| 5    | III  | Allied            | Paper-1     | 6         | 5        | Accounting for Business-1          | 25            | 75         | 100    |
| 6    | IV   | EVS               |             | 2         | 2        | Environmental studies              | 25            | 75         | 100    |
|      |      | TOTAL             |             | 30        | 22       |                                    | 165           | 435        | 600    |

## SEMESTER II

|    |     |                   |                 |    |    |   | CIA | UNI.<br>EXA<br>M | TOT<br>AL |
|----|-----|-------------------|-----------------|----|----|---|-----|------------------|-----------|
| 7  | I   | Language          | Paper-2         | 6  | 4  | Language                                      | 25  | 75               | 100       |
| 8  | II  | English           | Paper-2         | 4  | 4  | Foundation<br>English-II                      | 25  | 75               | 100       |
| 9  | III | Core(T)           | Paper-2         | 6  | 4  | C++ and Data<br>Structure                     | 25  | 75               | 100       |
| 10 | III | Core<br>practical | Practical-<br>2 | 3  | 3  | C++ and Data<br>Structure                     | 40  | 60               | 100       |
| 11 | III | Allied            | Paper-2         | 6  | 5  | Accounting for<br>Business-II                 | 25  | 75               | 100       |
| 12 | IV  | VE                |                 | 3  | 2  | VE  | -   | 50               | 50        |
| 13 | IV  | Soft skill        |                 | 2  | 1  | Soft skill for<br>linguistic<br>communication | -   | 50               | 50        |
|    |     | TOTAL             |                 | 30 | 23 |   | 140 | 460              | 600       |

## SEMESTER III

|    |     |                |                 |   |   |   | CIA | UNI.<br>EXA<br>M | TOTAL |
|----|-----|----------------|-----------------|---|---|---|-----|------------------|-------|
| 14 | II  | Core (T)       | Paper-3         | 6 | 4 | Mathematical<br>Foundation                            | 25  | 75               | 100   |
| 15 | III | Core (T)       | Paper-4         | 6 | 4 | Visual<br>Programming<br>and DBMS                     | 25  | 75               | 100   |
| 16 | III | Core Practical | Practical-<br>3 | 3 | 3 | Visual<br>Programming<br>and DBMS                     | 40  | 60               | 100   |
| 17 | III | Allied         | Paper-3         | 6 | 5 | Cost Accounting                                       | 25  | 75               | 100   |
| 18 | III | Elective I     | Paper-1         | 5 | 3 | 1. Data Mining<br>and Data<br>Warehousing<br>2.System | 25  | 75               | 100   |

|    |    |             |             |    |    |                        |     |     |     |
|----|----|-------------|-------------|----|----|------------------------|-----|-----|-----|
|    |    |             |             |    |    | Analysis & Design      |     |     |     |
| 19 | IV | Skill Based | Practical 1 | 2  | 2  | Open Source Software   | -   | 50  | 50  |
| 20 | IV | Non major   | Paper-1     | 2  | 2  | Information Technology | -   | 50  | 50  |
|    |    | TOTAL       |             | 30 | 23 |                        | 140 | 460 | 600 |

#### **SEMESTER –IV**

|    |     |                |             |    |    |                                     | <b>CIA</b> | <b>UNI.E<br/>XAM</b> | <b>TOTAL</b> |
|----|-----|----------------|-------------|----|----|-------------------------------------|------------|----------------------|--------------|
| 21 | III | Core (T)       | Paper-5     | 6  | 4  | Resource Management Techniques      | 25         | 75                   | 100          |
| 22 | III | Core (T)       | Paper-6     | 6  | 4  | ASP .Net                            | 25         | 75                   | 100          |
| 23 | III | Core Practical | Practical-4 | 3  | 3  | ASP .Net                            | 40         | 60                   | 100          |
| 24 | III | Allied         | Paper-4     | 6  | 5  | Management Accounting               | 25         | 75                   | 100          |
| 25 | III | Elective II    | Paper-2     | 5  | 3  | 1.Computer Graphics<br>2.E-Commerce | 25         | 75                   | 100          |
| 26 | IV  | Skill based    | Practical-2 | 2  | 2  | Tally                               | -          | 50                   | 50           |
| 27 | IV  | Non-Major      | Paper-2     | 2  | 2  | Internet and its Applications       | -          | 50                   | 50           |
|    |     | TOTAL          |             | 30 | 23 |                                     | 140        | 460                  | 600          |

Internship training programme during summer vacation with an extra credit = 1

#### **SEMESTER- V**

|    |     |          |         |   |   |                           | <b>CIA</b> | <b>UNI.E<br/>XAM</b> | <b>TOTAL</b> |
|----|-----|----------|---------|---|---|---------------------------|------------|----------------------|--------------|
| 28 | III | Core (T) | Paper-7 | 6 | 4 | Advanced Java Programming | 25         | 75                   | 100          |
| 29 | III | Core (T) | Paper-8 | 6 | 4 | Programming               | 25         | 75                   | 100          |

|    |     |                |                 |           |           |   |            |            |            |
|----|-----|----------------|-----------------|-----------|-----------|---|------------|------------|------------|
|    |     |                |                 |           |           | with Python   |            |            |            |
| 30 | III | Core (T)       | Paper-9         | 6         | 4         | Operating System  | 25         | 75         | 100        |
| 31 | III | Core Practical | Practical-5     | 3         | 3         | Advanced Java Programming   | 40         | 60         | 100        |
| 32 | III | Core Practical | Practical 6     | 3         | 3         | Programming with Python   | 40         | 60         | 100        |
| 33 | III | Elective-III   | Paper-3         | 4         | 3         | 1.Data Communication and Networking<br>2.Digital Image Processing | 25         | 75         | 100        |
| 34 | IV  | Skill Based    | Theory Paper -1 | 2         | 2         | Operating System Lab  | -          | 50         | 50         |
|    |     | <b>TOTAL</b>   |                 | <b>30</b> | <b>23</b> |   | <b>180</b> | <b>470</b> | <b>650</b> |

#### EMESTER –VI

|    |     |                |             |   |   |                                  | <b>CIA</b> | <b>UNI.E XAM</b> | <b>TOTAL</b> |
|----|-----|----------------|-------------|---|---|----------------------------------|------------|------------------|--------------|
| 35 | III | Core (T)       | Paper-10    | 6 | 4 | Android Programming              | 25         | 75               | 100          |
| 36 | III | Core (T)       | Paper-11    | 6 | 4 | Cloud Computing                  | 25         | 75               | 100          |
| 37 | III | Core (T)       | Paper-12    | 6 | 4 | Design and Analysis of algorithm | 25         | 75               | 100          |
| 38 | III | Core practical | Practical-7 | 3 | 3 | Android Programming              | 40         | 60               | 100          |
| 39 | III | Core Practical | Practical 8 | 3 | 3 | Cloud Computing                  | 40         | 60               | 100          |



|  |     |                    |             |    |    |  |     |     |     |
|--|-----|--------------------|-------------|----|----|--|-----|-----|-----|
| 40   | III | Elective IV        | Paper - 4   | 4  | 3  | 1 .Software Engineering<br>2. Computer Network | 25  | 75  | 100 |
| 41   | IV  | Skill Based        | Practical-3 | 2  | 2  | Multimedia                                     | -   | 50  | 50  |
| 42   | V   | Extension activity |             | -  | 3  |  | 100 | -   | 100 |
|  |     | TOTAL              |             | 30 | 26 |  | 280 | 470 | 750 |
| Mini project during summer vacation with an extra credit=2 |     |                    |             |    |    |  |     |     |     |

### **TOTAL CREDITS**

### **BCA [COMPUTER APPLICATION]**

| <b>PART</b> | <b>SUBJECT</b>                        | <b>PAPERS</b> | <b>CREDIT</b> | <b>TOTAL CREDITS</b> | <b>MARKS</b> | <b>TOTAL MARKS</b> |
|-------------|---------------------------------------|---------------|---------------|----------------------|--------------|--------------------|
| Part I      | Languages                             | 2             | 4             | 8                    | 100          | 200                |
| Part II     | English                               | 2             | 4             | 8                    | 100          | 200                |
| Part III    | Allied                                | 4             | 5             | 20                   | 100          | 400                |
| Part III    | Elective                              | 4             | 3             | 12                   | 100          | 400                |
| Part III    | Core Theory                           | 12            | 4             | 48                   | 100          | 1200               |
| Part III    | Core Practical                        | 8             | 3             | 24                   | 100          | 800                |
| Part IV     | EVS                                   | 1             | 2             | 2                    | 100          | 100                |
| Part IV     | Value Education                       | 1             | 2             | 2                    | 50           | 50                 |
| Part IV     | Skill Based Theory -1,<br>Practical-3 | 4             | 2             | 8                    | 50           | 200                |

|         |                      |    |   |     |     |      |
|---------|----------------------|----|---|-----|-----|------|
| Part IV | Non-Major            | 2  | 2 | 4   | 50  | 100  |
| Part IV | Soft Skill           | 1  | 1 | 1   | 50  | 50   |
| Part V  | Extension Activities | -  | 3 | 3   | 100 | 100  |
|         | Total                | 41 |   | 140 |     | 3800 |

### **DIGITAL LOGIC AND PROGRAMMING IN C**

| Semester | Subject Code | Category       | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|----------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |                | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE PAPER - 1 | 7           | 105     | 7          | 105     | 0         | 0       | 4       |

### **COURSE OBJECTIVE**

- This paper develops the basics concept used in design and analysis of digital systems and to develop the programming skills using C Language.

### **COURSE OUTCOME**

On the successful completion of the course, students will be able to

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | Learn the basic concepts of digital logic Circuits and Boolean Algebra Concept. | K1                      |
| <b>CO2</b> | Understand about Combinational and sequential circuits.                         | K2                      |
| <b>CO3</b> | Learn the fundamental concept of C Programming language.                        | K1                      |
| <b>CO4</b> | To implement Array, Functions and structures                                    | K2                      |
| <b>CO5</b> | To create files & pointers and apply its operations in program.                 | K3                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

### MAPPING WITH PROGRAMME OUTCOME

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | S   | S   | M   |
| CO2 | S   | S   | S   | M   | M   | S   |
| CO3 | S   | S   | M   | S   | M   | M   |
| CO4 | S   | S   | S   | M   | S   | S   |
| CO5 | S   | S   | M   | S   | M   | S   |

*S-Strong*

*M-Medium*

*L-Low*

### SYLLABUS

#### UNIT I: NUMBER SYSTEMS AND BOOLEAN ALGEBRA      NUMBER SYSTEMS : 23 Hrs

Decimal - Binary - Octal - Hexadecimal - Number Base Conversions – Complements - 1's Complement - 2's complement - 9's Complement – 10's Complements - binary Codes - BCD – Excess-3 - Gray code.

**BOOLEAN ALGEBRA:** Definition of Boolean algebra – Theorems of Boolean algebra - Boolean Functions – Digital Logic gates and Truth Table.

**SIMPLIFICATION OF BOOLEAN FUNCTIONS:** The Map Method – Two Variable Map - Three Variable Map - Four Variable Map - Don't Care Conditions – Product of Sums Simplification.

#### UNIT-II: COMBINATIONAL AND SEQUENTIAL CIRCUITS COMBINATIONAL LOGIC: 19hrs

Adders - Sub tractors – multiplexers - de-multiplexers – encoders – decoders.

**SEQUENTIAL LOGIC:** Flip flops: Basic Flip flop - Clocked RS Flip flop – D Flip flop – JK Flip flop – T Flip flop - Triggering of Flip Flops: Master Slave.

**REGISTERS AND COUNTERS:** Registers - 4 bit Register - Ripple Counter.

#### UNIT -III: C BASICS AND CONTROL CONSTRUCTS

**21 Hrs**

C fundamentals- Keywords - Variables – Data types - Operators- Constants- Expression – Library Functions- Decision making branching and looping – continue - break

#### UNIT IV: ARRAYS, FUNCTIONS AND STRUCTURES

**21 Hrs**

Arrays-Multi dimensional arrays- String- User defined functions- Call by Value and reference-Recursion- Storage classes- Structures and Union

## UNIT – V: POINTERS AND FILES

**21 Hrs**

Pointers- Pointer operations and Arithmetic- File management in C : File opening and closing- I/O operations on files - Error handling during I/O operations - Random access to files - Command line arguments

**Distribution of Marks: Theory :70% and Problems:30%**

### TEXT BOOKS

| S.No | Authors          | Title                              | Publishers          | Year of Publication |
|------|------------------|------------------------------------|---------------------|---------------------|
| 1.   | Morris Mono M.   | “Digital Logic and Computer Design | PHI Latest Pub. Ed. | 2007                |
| 2    | Balaguruswamay.E | Programming in ANSI C              | TMH                 | 2012                |

### REFERENCE BOOKS

| S.No | Authors                             | Title                               | Publishers | Year of Publication |
|------|-------------------------------------|-------------------------------------|------------|---------------------|
| 1.   | Albert Paul Malvino, Donald P Leach | Digital principles and applications | TMH        | 1996.               |

### WEB RESOURCES

4. [https://www.electronics-tutorials.ws/logic/logic\\_1.html](https://www.electronics-tutorials.ws/logic/logic_1.html)
5. <https://www.programiz.com/c-programming/>
6. <https://www.geeksforgeeks.org/c-language-set-1-introduction/>

### TEACHING METHODOLOGY

Class room teaching

- Group discussions
- Seminars
- Chart/Assignment
- Simulation Model
- Smart Class room

## SYLLABUS DESIGNERS

4. Mrs.B.ARULMOZHI , HOD, Dept of Computer Applications
5. Mrs.R.SHOBANA, Assistant Professor, Dept of Computer Applications
6. Ms. A. SIVASANKARI, HOD, Dept of Computer Science

## PROGRAMMING IN C

| Semester | Subject Code | Category     | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|--------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |              | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE PRACT-I | 3           | 45      | 0          | 0       | 3         | 45      | 3       |

## COURSE OBJECTIVE

- This practical develops the basic programming skills in C Language.

## SYLLABUS

1. Summation of Series: Sin(x) (Compare with built in functions)
2. Summation of Series Cos(x) (Compare with built in functions)
3. Counting the no. of vowels, consonants, words, white spaces in a line of text
4. Reverse a string & check for palindrome without built in string function
5.  ${}^n P_r$ ,  ${}^n C_r$  in a single program using function
6. Matrix Addition, subtraction and multiplication
7. Linear Search of a number in an array
8. Sorting an array in ascending and descending order
9. Finding maximum and minimum of list of numbers
10. Call by value and call by reference of functions
11. Employee pay bill using structure
12. Preparing an EB bill using file

**Distribution of Marks: Program Output with Viva voce: 85% and Record:15%**

### **SYLLABUS DESIGNERS**

1. Mrs.B.ARULMOZHI , HOD, Dept of Computer Applications
2. Mrs.R.SHOBANA, Assistant Professor, Dept of B Computer Applications
3. Ms. A.SIVASANKARI, HOD, Dept of Computer Science

### *C++ AND DATA STRUCTURE*

| Semester | Subject Code | Category      | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|---------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |               | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| II       |              | CORE PAPER-II | 6           | 90      | 6          | 90      | 0         | 0       | 4       |

### **OBJECTIVE**

- This paper helps the students to quickly move into the world of C++ with Object Oriented Programming and Data structure concept.

### **COURSE OUTCOME**

On the successful completion of the course, students will be able to

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To learn the Basic Concept of Object Oriented Programming Language.               | K1                      |
| <b>CO2</b> | To understand how to implement OOPs Concept in C++.                               | K2                      |
| <b>CO3</b> | Understanding the Data Structure Concept  | K2                      |
| <b>CO4</b> | To develop the algorithms for various data structure operations and applications. | K3                      |
| <b>CO5</b> | To pertain the data in trees and Graphs.  | K4                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

### MAPPING WITH PROGRAMME OUTCOME

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | M   | M   |
| CO2 | S   | S   | S   | S   | M   | S   |
| CO3 | S   | M   | S   | S   | M   | M   |
| CO4 | S   | S   | S   | M   | S   | S   |
| CO5 | S   | S   | S   | M   | M   | S   |

*S-Strong*

*M-Medium*

*L-Low*

### SYLLABUS

#### UNIT I – BASICS OF OOP'S and C++

**18 Hrs**

Basic Concepts of OOP - Benefits of OOP - Applications of OOP- Introduction to C++ - Streams Classes & Member functions of stream class - manipulators - -I/O in C++ -Formatted & - Unformatted Console I/O Operations.

#### UNIT II – CLASSES AND OBJECTS AND FILE OPERATIONS **19 Hrs**

Classes and Objects - Constructors and Destructors - Types of Constructors - Defining member functions - Inline function - Friend function- Function Overloading - Operator overloading - Inheritance - Types of Inheritance - Virtual Functions and Polymorphism. Files-File operations.

#### UNIT III – BASICS OF DATA STRUCTURES

**18 Hrs**

Definition of Data structure – Primitive and Composite data types – Arrays, Operations on Arrays - Stack – Operations on stack – Infix to Post fix Conversion - Queue – Operations on Queue – Circular Queues.

#### UNIT IV -COMPOSITE DATA STRUCTURES

**17 Hrs**

Singly Linked List – Operations, - Doubly Linked List – Operations – Sorting and Searching.

#### UNIT V –TREES AND GRAPHS

**18 Hrs**

Trees and Graphs: Binary Trees - Operations - Tree Traversals- Recursive In order, Preorder, Post order - Graph - Definition, Types of Graphs - Graph Traversal – DFS & BFS

**Distribution of Marks: Theory :80% and Problems:20%**

### TEXT BOOKS

| S.No | Authors         | Title                                | Publishers          | Year of Publication |
|------|-----------------|--------------------------------------|---------------------|---------------------|
| 1.   | E. Balagurusamy | Object Oriented Programming with C++ | Tata McGraw Hill    | 1995                |
| 2.   | Nell Dale       | C++ with Data structure              | Narosa Publications | 2000                |

### REFERENCE BOOKS

| S.No | Authors         | Title                                | Publishers              | Year of Publication |
|------|-----------------|--------------------------------------|-------------------------|---------------------|
| 1.   | Reema Thareja   | Object Oriented Programming with C++ | Oxford University Press | 2015                |
| 2.   | Varsha H. Patil | Data Structures using C++            | Oxford University Press | 2012                |

### WEB RESOURCES

4. <https://www.tutorialspoint.com/cplusplus/>
5. <https://www.guru99.com/cpp-tutorial.html>
6. [https://www.tutorialspoint.com/data\\_structures\\_algorithms/](https://www.tutorialspoint.com/data_structures_algorithms/)

### TEACHING METHODOLOGY

- Class room teaching
- Group discussions and Seminars
- Chart/Assignment
- Simulation Model
- Smart Class room

### SYLLABUS DESIGNERS

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6. Ms. A.SIVASANKARI, HOD, Dept of Computer Science



### **C++ AND DATA STRUCTURE**

| <b>Semester</b> | <b>Subject Code</b> | <b>Category</b>    | <b>Lecture Hrs</b> |                | <b>Theory Hrs</b> |                | <b>Practical</b> |                | <b>Credits</b> |
|-----------------|---------------------|--------------------|--------------------|----------------|-------------------|----------------|------------------|----------------|----------------|
|                 |                     |                    | <b>Per week</b>    | <b>Per Sem</b> | <b>Per week</b>   | <b>Per Sem</b> | <b>Per week</b>  | <b>Per Sem</b> |                |
| II              |                     | CORE PRACTICAL – 2 | 3                  | 45             | 0                 | 0              | 45               | 45             | 3              |

### **COURSE OBJECTIVE**

- This practical help us to develops the Object Oriented Programming Concept using C++ and Data Structure.

### **C++ CONCEPTS**

Operator Overloading  
Friend function  
Inheritance  
Polymorphism  
Files

### **DATA STRUCTURE**

7. Implement PUSH, POP operations of stack using Arrays
8. Implement add, delete operations of queue using Pointers
9. Conversions of infix to postfix using stack operations
10. Addition of two polynomials using Arrays
11. Binary tree traversals [in-order, pre-order, and post-order] using linked list.
12. Depth First Search and Breadth first Search for Graphs.

**Distribution of Marks: Program Output with Viva voce: 85% and Record: 15%**

### **SYLLABUS DESIGNERS**

1. Mrs. B.ARULMOZHI , HOD, Dept of Computer Applications
2. Mrs P.SIVAGAMI, Assistant Professor, Dept of Computer Science
3. Ms. A.SIVASANKARI, HOD, Dept of Computer Science

## DEPARTMENT OF COMPUTER APPLICATIONS [B.COM CA]

### PROGRAMME EDUCATIONAL OBJECTIVES

**PEO1.** Graduates will have skills and knowledge to excel in their professional career in Computer Science and its related disciplines.

**PEO2.** Graduates will be ethically and socially responsible solution providers in Computer Science and successfully pursue higher education in reputed institutions.

### PROGRAMME OUTCOME

**PO1:** To apply knowledge of computing, Accounts, and basic sciences appropriate to the discipline

**PO2.** To analyze a problem, and identify and define the computing requirements appropriate to its solution

**PO3.** To design, implements, and evaluate a computer-based system, process, component, or program to meet desired needs

**PO4.** To apply professional ethics and cyber regulations, responsibilities and pledge to the norms of professional computing practice.

**PO5.** To demonstrate the knowledge of sustainable development of computing systems/products/solutions with an understanding of the impact of these solutions on the Society and Environment.

**PO6.** To spot the need for and engage in lifelong learning to cope up with the rapidly evolving disciplines of Computer Science and its application domains.

## DEPARTMENT OF COMMERCE(COMPUTER APPLICATION)

### B.COM(CA) CBCS PATTERN

### THE COURSE OF STUDY AND THE SCHEME OF EXAMINATION

| S.N<br>O     | PART | STUDY<br>COMPONENTS | INS.<br>HRS./W<br>EEK | CRE<br>DIT | TITLE OF THE<br>PAPER    | CIA | UNIV<br>EXAM | TO<br>TA<br>L |
|--------------|------|---------------------|-----------------------|------------|--------------------------|-----|--------------|---------------|
|              |      | COURSE TITLE        |                       |            |                          |     |              |               |
| SEMESTER – I |      |                     |                       |            |                          |     |              |               |
| 1            | I    | Language –I         | 6                     | 4          | Tamil –I /other language | 25  | 75           | 100           |
| 2            | II   | English –I          | 6                     | 4          | English -I               | 25  | 75           | 100           |
| 3            | III  | Core paper -I       | 5                     | 4          | Financial Accounting -I  | 25  | 75           | 100           |

|                      |     |                        |    |    |                                    |     |     |     |
|----------------------|-----|------------------------|----|----|------------------------------------|-----|-----|-----|
| 4                    | III | Core paper –II         | 5  | 4  | Basics of information technology   | 25  | 75  | 100 |
| 5                    | III | Allied - I             | 6  | 5  | Indian economy I                   | 25  | 75  | 100 |
| 6                    | IV  | EVS                    | 2  | 2  | EVS                                | 25  | 75  | 100 |
|                      |     |                        | 30 | 23 |                                    | 150 | 450 | 600 |
| <b>SEMESTER –II</b>  |     |                        |    |    |                                    |     |     |     |
| 1                    | I   | Language –II           | 6  | 4  | Tamil –II /other language          | 25  | 75  | 100 |
| 2                    | II  | English –II            | 4  | 4  | English -II                        | 25  | 75  | 100 |
| 3                    | III | Core paper –III        | 5  | 4  | Financial Accounting -II           | 25  | 75  | 100 |
| 4                    | III | Core paper-IV          | 5  | 4  | Internet and its applications      | 25  | 75  | 100 |
| 5                    | III | Allied Paper –II       | 6  | 5  | Indian Economy -II                 | 25  | 75  | 100 |
| 6                    | IV  | Value Education        | 2  | 2  | Value Education                    | -   | 50  | 50  |
| 7                    | IV  | Soft Skill             | 2  | 1  | Soft Skill                         | -   | 50  | 50  |
|                      |     |                        | 30 | 24 |                                    | 125 | 475 | 600 |
| <b>SEMESTER III</b>  |     |                        |    |    |                                    |     |     |     |
| 1                    | I   | Core paper –V          | 6  | 5  | Corporate Accounting –I            | 25  | 75  | 100 |
| 2                    | II  | Core paper –VI         | 5  | 4  | Business Law                       | 25  | 75  | 100 |
| 3                    | III | Core paper –VII        | 5  | 4  | Modern Banking                     | 25  | 75  | 100 |
| 4                    | III | Core practical         | 3  | 3  | Internet and office automation lab | 40  | 60  | 100 |
| 5                    | III | Allied Paper –III      | 6  | 5  | Business Statistics -I             | 25  | 75  | 100 |
| 6                    | IV  | Skill Based Subject –I | 3  | 2  | Human Resource Management          | -   | 50  | 50  |
| 7                    | IV  | Non Major –I           | 2  | 2  | Elements of accountancy-I          | -   | 50  | 50  |
|                      |     |                        | 30 | 25 |                                    | 140 | 460 | 600 |
| <b>SEMESTER – IV</b> |     |                        |    |    |                                    |     |     |     |
| 1                    | III | Core paper –VIII       | 6  | 5  | Corporate Accounting –II           | 25  | 75  | 100 |
| 2                    | III | Core paper –IX         | 5  | 4  | Principles of Marketing            | 25  | 75  | 100 |

|               |     |                          |    |    |  |     |     |     |
|---------------|-----|--------------------------|----|----|--|-----|-----|-----|
| 3             | III | Core paper –X            | 5  | 4  | Data Base Management System  | 25  | 75  | 100 |
| 4             | III | Core practical           | 3  | 3  | RDBMS lab  | 40  | 60  | 100 |
| 5             | III | Allied Paper –IV         | 6  | 5  | Business statistics-II   | 25  | 75  | 100 |
| 6             | IV  | Skill Based Subject –II  | 3  | 2  | Business communication   | -   | 50  | 50  |
| 7             | IV  | Non Major –II            | 2  | 2  | Elements of accountancy-II   | -   | 50  | 50  |
|               |     |                          | 30 | 25 |  | 140 | 460 | 600 |
| SEMESTER – V  |     |                          |    |    |  |     |     |     |
| 1             | III | Core paper – XI          | 6  | 4  | Cost accounting - I  | 25  | 75  | 100 |
| 3             | III | Core paper –XII          | 6  | 4  | Management Accounting -I   | 25  | 75  | 100 |
| 4             | III | Core paper –XIII         | 5  | 4  | Multimedia   | 25  | 75  | 100 |
| 5             | III | Elective –I              | 5  | 3  | Income Tax law and practice -I   | 25  | 75  | 100 |
|               | III | Elective-II              | 5  | 3  | Business Management  | 25  | 75  | 100 |
| 6             | IV  | Skill Based Subject –III | 3  | 2  | Personality Development  | -   | 50  | 50  |
|               |     |                          | 30 | 20 |  | 125 | 425 | 550 |
| SEMESTER – VI |     |                          |    |    |  |     |     |     |
| 1             | III | Core paper – XIV         | 6  | 5  | Cost accounting - II   | 25  | 75  | 100 |
| 2             | III | Core paper – XV          | 6  | 4  | Programming in Java  | 25  | 75  | 100 |
| 3             | III | Core practical           | 3  | 3  | Java programming and web technology  | 40  | 60  | 100 |
| 4             | III | Elective –III            | 6  | 3  | Income tax law and practice-II   | 25  | 75  | 100 |
| 5             | III | Elective –IV             | 6  | 3  | Choose any 1 from the options:<br>(a)Web technology<br>(b) operating system<br>(c) object oriented analysis and design | 25  | 75  | 100 |
| 6             | IV  | Skill Based              | 3  | 2  | Entrepreneurial  | -   | 50  | 50  |

|   |   |                      |     |     |                      |     |     |      |
|---|---|----------------------|-----|-----|----------------------|-----|-----|------|
|   |   | Subject –IV          |     |     | development          |     |     |      |
| 7 | V | Extension Activities | -   | 3   | Extension Activities | 100 | 0   | 100  |
|   |   |                      | 30  | 23  |                      | 240 | 410 | 650  |
|   |   | TOTAL                | 180 | 140 |                      |     |     | 3600 |

### CONSOLIDATED STATEMENT

| Part     | Subject           | Papers | Hours | Credit | Total Credits | Marks | Total Marks |
|----------|-------------------|--------|-------|--------|---------------|-------|-------------|
| Part-I   | Languages         | 2      | 12    | 4      | 8             | 100   | 200         |
| Part-II  | English           | 2      | 10    | 4      | 8             | 100   | 200         |
| Part-III | Allied(odd Sem)   | 2      | 12    | 5      | 10            | 100   | 200         |
|          | Allied (even sem) | 2      | 12    | 5      | 10            | 100   | 200         |
|          | Elective          | 3      | 17    | 3      | 12            | 100   | 300         |
|          | Core paper        | 16     | 89    | 4-5    | 63            | 100   | 1600        |
|          | Core practical    | 3      | 9     | 3      | 9             | 100   | 300         |

|         |                       |           |            |   |            |     |             |
|---------|-----------------------|-----------|------------|---|------------|-----|-------------|
| Part-IV | Environmental science | 1         | 2          | 2 | 2          | 100 | 100         |
|         | Soft Skills           | 1         | 2          | 1 | 1          | 50  | 50          |
|         | Value Education       | 1         | 2          | 2 | 2          | 50  | 50          |
|         | Non major             | 2         | 4          | 2 | 4          | 50  | 100         |
|         | Skill-Based           | 4         | 9          | 2 | 8          | 50  | 200         |
| Part-V  | Extension Activities  | 1         | -          | 3 | 3          | 100 | 100         |
|         | <b>Total</b>          | <b>40</b> | <b>180</b> |   | <b>140</b> |     | <b>3600</b> |

*BASICS OF INFORMATION TECHNOLOGY*

| Semester | Subject Code | Category      | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|---------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |               | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE PAPER-II | 5           | 75      | 5          | 75      | 0         | 0       | 4       |

**COURSE OBJECTIVE**

➤ This paper develops the students to know the basic concept of hardware, software, networking, and telecommunications and latest technological development in a computer system.

**COURSE OUTCOME**

On the successful completion of the course, students will be able to

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To learn the basic of computer and its classifications.             | K1                      |
| <b>CO2</b> | Understanding basic concepts of number system and Number Conversion | K2                      |
| <b>CO3</b> | Learn about the Different types of Storage Devices.                 | K2                      |

|            |  |    |
|------------|--|----|
| <b>CO4</b> | To Understand the different types of software. | K3 |
| <b>CO5</b> | To Learn computer network and Internet         | K3 |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

### **MAPPING WITH PROGRAMME OUTCOME**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | M          | S          | S          |
| <b>CO2</b> | S          | S          | M          | S          | S          | S          |
| <b>CO3</b> | S          | S          | M          | M          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | M          | S          |
| <b>CO5</b> | S          | S          | M          | S          | S          | M          |

*S-Strong M-Medium L-Low*

### **SYLLABUS**

#### **UNIT I – INTRODUCTION TO COMPUTERS**

**15 Hrs**

Introduction - types of computers - characteristics of computers - Classification of digital computer systems.

#### **UNIT II – NUMBER SYSTEM**

**16 Hrs**

Number system - Decimal – binary – compliments –Bits, bytes, words - Octal - Hexadecimal Number system and Number conversions.

#### **UNIT III - MEMORY UNITS**

**14 Hrs**

Memory Units - Auxiliary storage devices – Tape – disks - CD etc - Input devices - Output devices - Monitors – printers - plotters.

#### **UNIT IV – SYSTEM SOFTWARES**

**14 Hrs**

Introduction to computer software - operating systems - compilers – interpreters - Operating systems - functions of an OS - Classification of OS - Programming Languages.

#### **UNIT V – COMPUTER NETWORKS**

**16 Hrs**

Computer Networks - Network Topologies - Internet-Internet basics - TCP/IP - FTP – HTTP - Internet Addressing - searching the web - search engines - Email.

**Distribution of Marks: Theory: 85% and Applications:15%**

### TEXT BOOKS

| S.No | Authors                    | Title                                  | Publishers                      | Year of Publication |
|------|----------------------------|--|---------------------------------|---------------------|
| 1.   | Alexis Leon, Mathews Leon- | Fundamentals of Information Technology | Vikas publishing house (p) ltd. | 2009                |
| 2.   | Bradley. R                 | Understanding Computer Science,        | Stanley Thornes Publications.   | 1991                |

### REFERENCE BOOKS

| S.No | Authors      | Title                           | Publishers          | Year of Publication |
|------|--------------|---------------------------------|---------------------|---------------------|
| 1.   | Cohen, D.I.A | Introduction to Computer Theory | John Wiley and Sons | 1997                |
| 2.   | Sanders, D.H | Computers Today                 | McGraw Hill Company | 1985                |

**WEB SOURCES:** <http://www.scitopia.org/scitopia>

<http://portal.acm.org/portal.cfm>

### TEACHING METHODOLOGY

- Class room teaching
- Group discussions
- Seminars
- Chart/Assignment
- Simulation Model
- Smart Class room

### SYLLABUS DESIGNERS

1. Mrs.B.ARULMOZHI , HOD, Dept of Computer Applications
2. Mrs.K.AYESHA Assistant Professor, Dept of Computer Applications
3. Ms.A.SIVASANKARI, HOD, Dept of Computer Science



## INTERNET AND ITS APPLICATIONS

| Semester | Subject Code | Category      | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|---------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |               | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE PAPER-IV | 5           | 75      | 5          | 75      | 0         | 0       | 4       |

### COURSE OBJECTIVE

To equip students to basics of Internet usage and prepare them for digital world.

### COURSE OUTCOME

On the successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | To learn Basic Concept of Internet.                        | K1                      |
| CO2       | To learn how to use Web browser                            | K2                      |
| CO3       | To learn how to use E-mail id -sending and Receiving mails | K3                      |
| CO4       | Introduction to HTML.                                      | K2                      |
| CO5       | To learn about E-marketing                                 | K3                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

### MAPPING WITH PROGRAMME OUTCOME

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | M   | S   | S   |
| CO2 | S   | S   | M   | S   | M   | S   |
| CO3 | S   | S   | S   | M   | S   | S   |
| CO4 | S   | S   | S   | S   | M   | M   |
| CO5 | S   | S   | S   | M   | M   | S   |

*S-Strong    M-Medium    L-Low*

## **SYLLABUS**

### **UNIT - I INTERNET BASICS**

**15 Hrs**

Introduction to Computers Programming Language types History of Internet Personal computers History of World Wide Web- Micro software .NET Java-Web resources.

### **UNIT - II WEB BROWSERS**

**16 Hrs**

Web Browsers - Internet Explorer - connecting to Internet Features of Internet explorer6 Searching the Internet- online help and tutorials - File Transmission Protocol (FTP) Browser settings.

### **UNIT - III E-MAIL**

**14 Hrs**

Attaching a file, Electronic mail creating an E-mail id sending and Receiving mails - attaching a file - Instance messaging - other web browsers.

### **UNIT - IV HTML**

**16 Hrs**

Introduction to HTML headers – Linking - Images-special characters and line breaks unordered lists- simple HTML programs.

### **UNIT - V DIGITAL CASH**

**14 Hrs**

E-marketing consumer tracking Electronic advertising search engine – CRM - credit card payments Digital cash and e-wallets micro payments- smart card

**Distribution of Marks: Theory :80% and Applications:20%**

#### **TEXT BOOK**

| <b>S.No</b> | <b>Authors</b>                             | <b>Title</b>                                | <b>Publishers</b>     | <b>Year of Publication</b> |
|-------------|--|---|-----------------------|----------------------------|
| 1.          | A.M. Deitel and P.J. Deitel, A.B. Goldberg | Internet and world wide web: How to program | Pearson Education ltd | 2008                       |

#### **REFERENCE BOOK**

| <b>S.No</b> | <b>Authors</b> | <b>Title</b> | <b>Publishers</b> | <b>Year of Publication</b> |
|-------------|----------------|--------------|-------------------|----------------------------|
| 1.          | Harley hahn    | The Internet | TMH               | Recent Publication         |

## WEB RESOURCES

- 1.[https://www.tutorialspoint.com/internet\\_technologies/internet\\_overview.htm](https://www.tutorialspoint.com/internet_technologies/internet_overview.htm)
- 2.[https://www.tutorialspoint.com/basics\\_of\\_computer\\_science/basics\\_of\\_computer\\_science\\_internet.htm](https://www.tutorialspoint.com/basics_of_computer_science/basics_of_computer_science_internet.htm)

## TEACHING METHODOLOGY

- Class room teaching
- Group discussions
- Seminars
- Chart/Assignment
- Simulation Model
- Smart Class room

## SYLLABUS DESIGNERS

1. Mrs.B.ARULMOZHI , HOD, Dept of Computer Applications
2. Mrs.P.SIVAGAMI Assistant Professor, Dept of Computer Science
3. Ms.A.SIVASANKARI, HOD, Dept of Computer Science

## DEPARTMENT OF COMPUTER SCIENCE [B.Sc., ISM]

### PROGRAMME EDUCATIONAL OBJECTIVES

**PEO1.** Graduates will have skills and knowledge to excel in their professional career in Computer Science and its related disciplines.

**PEO2.** Graduates will be ethically and socially responsible solution providers in Computer Science and successfully pursue higher education in reputed institutions.

### PROGRAMME OUTCOME

**PO1:** To apply knowledge of computing, Accounts, Information system and basic sciences appropriate to the discipline

**PO2.** To analyze a problem, and identify and define the computing requirements appropriate to its solution

**PO3.** To design, implements, and evaluate a computer-based system, process, component, or program to meet desired needs

**PO4.** To apply professional ethics and cyber regulations, responsibilities and pledge to the norms of professional computing practice.

**PO5.** To demonstrate the knowledge of sustainable development of computing systems/products/solutions with an understanding of the impact of these solutions on the Society and Environment.

**PO6.** To spot the need for and engage in lifelong learning to cope up with the rapidly evolving disciplines of Computer Science and its application domains.

## **DEPARTMENT OF MANAGEMENT STUDIES**

### **The course of study and scheme of Examination**

#### **SEMESTER- I**

| S.NO | PART | COURSE TITLE       | SUBJECT CODE | Ins /Hrs | Credit | Title of the paper               | MAXIMUM MARKS |           |       |
|------|------|--------------------|--------------|----------|--------|----------------------------------|---------------|-----------|-------|
|      |      |                    |              |          |        |                                  | CIA           | UNI. EXAM | TOTAL |
| 1    | I    | Language - I       |              | 6        | 4      | Tamil – I / Other language       | 25            | 75        | 100   |
| 2    | II   | English – I        |              | 6        | 4      | English – I                      | 25            | 75        | 100   |
| 3    | III  | Core paper – I     |              | 6        | 4      | Basics of Information Technology | 25            | 75        | 100   |
| 4    | III  | Core practical - I |              | 3        | 3      | Office Automation Lab            | 40            | 60        | 100   |
| 5    | III  | Allied paper – I   |              | 7        | 5      | Principles of management         | 25            | 75        | 100   |
| 6    | IV   | EVS                |              | 2        | 2      | Environmental studies            | 25            | 75        | 100   |
|      |      | TOTAL              |              | 30       | 22     |                                  | 165           | 435       | 600   |

#### SEMESTER II

|    |     |                   |  |   |   |                               |    |    |     |
|----|-----|-------------------|--|---|---|-------------------------------|----|----|-----|
| 7  | I   | Language – II     |  | 6 | 4 | Tamil – II / Other language   | 25 | 75 | 100 |
| 8  | II  | English – II      |  | 4 | 4 | English – II                  | 25 | 75 | 100 |
| 9  | III | Core paper – II   |  | 6 | 4 | Internet and its Applications | 25 | 75 | 100 |
| 10 | III | Core Practical II |  | 3 | 3 | Internet and its Applications | 40 | 60 | 100 |

|    |     |                      |  |    |    |  |     |     |     |
|----|-----|----------------------|--|----|----|--|-----|-----|-----|
| 11 | III | Allied paper – II    |  | 4  | 3  | Mathematical and statistics for management | 25  | 75  | 100 |
| 12 | III | Allied practical – I |  | 3  | 2  | Quantitative Techniques                    | 40  | 60  | 100 |
| 13 | IV  | Value education      |  | 2  | 2  | Value education                            | -   | 50  | 50  |
| 14 | IV  | Soft skills          |  | 2  | 1  | Soft skills                                | -   | 50  | 50  |
|    |     | TOTAL                |  | 30 | 23 |  | 180 | 520 | 700 |

### SEMESTER III

|    |     |                         |  | Ins<br>/H<br>rs | Cr<br>edi<br>t |  | CIA | UNI.<br>EXA<br>M | TO<br>TA<br>L |
|----|-----|-------------------------|--|-----------------|----------------|--|-----|------------------|---------------|
| 15 | I   | Language – III          |  | 6               | 4              | Tamil – III/<br>Other language           | 25  | 75               | 100           |
| 16 | II  | English – III           |  | 6               | 4              | English –III                             | 25  | 75               | 100           |
| 17 | III | Core paper – III        |  | 4               | 4              | Programming in C and C++                 | 25  | 75               | 100           |
| 18 | III | Core practical – III    |  | 3               | 3              | Practical :<br>Programming in C and C++  | 40  | 60               | 100           |
| 19 | III | Allied paper – III      |  | 7               | 5              | Business Policy and Strategic Management | 25  | 75               | 100           |
| 20 | IV  | Skill based subject – I |  | 2               | 2              | Business communication                   | -   | 50               | 50            |
| 21 | IV  | Non – major – I         |  | 2               | 2              | Business Environment                     | -   | 50               | 50            |
|    |     | TOTAL                   |  | 30              | 24             |  | 140 | 460              | 600           |

### SEMESTER IV

|    |     |                 |  |   |   |                               |    |    |     |
|----|-----|-----------------|--|---|---|-------------------------------|----|----|-----|
| 22 | I   | Language – IV   |  | 6 | 4 | Tamil – IV/<br>Other language | 25 | 75 | 100 |
| 23 | II  | English – IV    |  | 6 | 4 | English –IV                   | 25 | 75 | 100 |
| 24 | III | Core paper – IV |  | 4 | 4 | RDBMS                         | 25 | 75 | 100 |

|    |     |                          |  |    |    |                         |     |     |     |
|----|-----|--------------------------|--|----|----|-------------------------|-----|-----|-----|
| 25 | III | Core practical – IV      |  | 3  | 3  | Practical RDBMS         | 40  | 60  | 100 |
| 26 | III | Allied paper – IV        |  | 7  | 5  | Organizational behavior | 25  | 75  | 100 |
| 27 | IV  | Skill based subject – II |  | 2  | 2  | E – Business            | -   | 50  | 50  |
| 28 | IV  | Non – major – II         |  | 2  | 2  | Digital Marketing       | -   | 50  | 50  |
|    |     | TOTAL                    |  | 30 | 24 |                         | 140 | 460 | 600 |

| SEMESTER- V |     |                           |  |           |          |   |     |           |       |
|-------------|-----|---------------------------|--|-----------|----------|---|-----|-----------|-------|
|             |     |                           |  | Ins /Hr s | Cr edi t |   | CIA | UNI.E XAM | TOTAL |
| 29          | III | Core paper –V             |  | 6         | 3        | Multimedia                                  | 25  | 75        | 100   |
| 30          | III | Core paper – VI           |  | 7         | 4        | Web technology                              | 25  | 75        | 100   |
| 31          | III | Core paper – VII          |  | 6         | 4        | Marketing Management                        | 25  | 75        | 100   |
| 32          | III | Core practical–V          |  | 3         | 3        | Multimedia using Flash                      | 40  | 60        | 100   |
| 33          | III | Elective – I              |  | 3         | 3        | Principles of Human Resource Management – I | 25  | 75        | 100   |
| 34          | III | Elective – II             |  | 3         | 3        | International Business Management – I       | 25  | 75        | 100   |
| 35          | IV  | Skill based subject – III |  | 2         | 2        | Personality Development and Soft Skills     | -   | 50        | 50    |

|                     |     |                          |  |    |     |  |     |               |               |
|---------------------|-----|--------------------------|--|----|-----|--|-----|---------------|---------------|
|                     |     |                          |  |    |     | for Business                                 |     |               |               |
|                     |     | TOTAL                    |  | 30 | 22  |  | 165 | 485           | 650           |
| <b>SEMESTER –VI</b> |     |                          |  |    |     |  |     |               |               |
|                     |     |                          |  |    |     |  | CIA | UN.I.E<br>XAM | TO<br>TA<br>L |
| 36                  | III | Core paper –VIII         |  | 8  | 4   | Programming in JAVA                          | 25  | 75            | 100           |
| 37                  | III | Core paper – IX          |  | 8  | 4   | Marketing Research                           | 25  | 75            | 100           |
| 38                  | III | Core practical – VI      |  | 3  | 3   | JAVA Programming and Web Technology          | 40  | 60            | 100           |
| 39                  | III | Core practical – VII     |  | 3  | 3   | Tally Practical                              | 40  | 60            | 100           |
| 40                  | III | Elective – III           |  | 3  | 3   | Principles of Human Resource Management – II | 25  | 75            | 100           |
| 41                  | III | Elective – IV            |  | 3  | 3   | International Business Management – II       | 25  | 75            | 100           |
| 42                  | IV  | Skill based subject – IV |  | 2  | 2   | Business Ethics                              | -   | 50            | 50            |
| 43                  | V   | Extension Activities     |  | -  | 3   | Extension Activities                         | 100 | -             | 100           |
|                     |     |                          |  | 30 | 25  |  | 280 | 470           | 750           |
|                     |     |                          |  |    | 140 |  |     |               | 3900          |

**CONSOLIDATED STATEMENT  
TOTAL CREDITS  
BCA [COMPUTER APPLICATION]**

| <b>PART</b> | <b>SUBJECT</b>                     | <b>PAPERS</b> | <b>CREDIT</b> | <b>TOTAL CREDITS</b> | <b>MARKS</b> | <b>TOTAL MARKS</b> |
|-------------|------------------------------------|---------------|---------------|----------------------|--------------|--------------------|
| Part I      | Languages                          | 2             | 4             | 8                    | 100          | 200                |
| Part II     | English                            | 2             | 4             | 8                    | 100          | 200                |
| Part III    | Allied                             | 4             | 5             | 20                   | 100          | 400                |
| Part III    | Elective                           | 4             | 3             | 12                   | 100          | 400                |
| Part III    | Core Theory                        | 12            | 4             | 48                   | 100          | 1200               |
| Part III    | Core Practical                     | 8             | 3             | 24                   | 100          | 800                |
| Part IV     | EVS                                | 1             | 2             | 2                    | 100          | 100                |
| Part IV     | Value Education                    | 1             | 2             | 2                    | 50           | 50                 |
| Part IV     | Skill Based Theory -1, Practical-3 | 4             | 2             | 8                    | 50           | 200                |
| Part IV     | Non-Major                          | 2             | 2             | 4                    | 50           | 100                |
| Part IV     | Soft Skill                         | 1             | 1             | 1                    | <b>50</b>    | 50                 |
| Part V      | Extension Activities               | -             | 3             | 3                    | 100          | 100                |
|             | <b>Total</b>                       | <b>41</b>     |               | <b>140</b>           |              | 3800               |



### BASICS OF INFORMATION TECHNOLOGY

| Semester | Subject Code | Category | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|----------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |          | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE     | 6           | 90      | 6          | 90      | 0         | 0       | 4       |

#### COURSE OBJECTIVE

- This paper develops the students to know the basic concept of hardware, software, networking, and telecommunications and latest technological development in a computer system.

#### COURSE OUTCOME

On the successful completion of the course, students will be able to

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To learn the basic of computer and its classifications.             | K1                      |
| <b>CO2</b> | Understanding basic concepts of number system and Number Conversion | K2                      |
| <b>CO3</b> | Learn about the Different types of Storage Devices.                 | K2                      |
| <b>CO4</b> | To Understand the different types of software.                      | K3                      |
| <b>CO5</b> | To Learn computer network and Internet                              | K3                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

#### MAPPING WITH PROGRAMME OUTCOME

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | S   | S   | M   | S   | S   |
| <b>CO2</b> | S   | S   | M   | S   | S   | S   |
| <b>CO3</b> | S   | S   | M   | M   | S   | S   |
| <b>CO4</b> | S   | S   | S   | S   | M   | S   |
| <b>CO5</b> | S   | S   | M   | S   | S   | M   |

*S-Strong      M-Medium      L-Low*

## SYLLABUS

### UNIT I – INTRODUCTION TO COMPUTERS

18 Hrs

Introduction - types of computers - characteristics of computers - Classification of digital computer systems.

### UNIT II – NUMBER SYSTEM

19 Hrs

Number system - Decimal – binary – compliments –Bits, bytes, words - Octal - Hexadecimal Number system and Number conversions.

### UNIT III - MEMORY UNITS

17 Hrs

Memory Units - Auxiliary storage devices – Tape – disks - CD etc - Input devices -Output devices - Monitors – printers - plotters.

### UNIT IV – SYSTEM SOFTWARES

17 Hrs

Introduction to computer software - operating systems - compilers – interpreters -Operating systems - functions of an OS - Classification of OS - Programming Languages.

### UNIT V – COMPUTER NETWORKS

18 Hrs

Computer Networks - Network Topologies - Internet-Internet basics - TCP/IP - FTP – HTTP - Internet Addressing - searching the web - search engines - Email.

**Distribution of Marks: Theory: 85% and Applications:15%**

## TEXT BOOKS

| S.No | Authors                       | Title                                     | Publishers                         | Year of Publication |
|------|-------------------------------|---|------------------------------------|---------------------|
| 1.   | Alexis Leon,<br>Mathews Leon- | Fundamentals of<br>Information Technology | Vikas publishing<br>house (p) ltd. | 2009                |
| 2.   | Bradley. R                    | Understanding Computer<br>Science,        | Stanley Thornes<br>Publications.   | 1991                |

## REFERENCE BOOKS

| S.No | Authors      | Title                              | Publishers             | Year of Publication |
|------|--------------|------------------------------------|------------------------|---------------------|
| 1.   | Cohen, D.I.A | Introduction to Computer<br>Theory | John Wiley and<br>Sons | 1997                |
| 2.   | Sanders, D.H | Computers Today                    | McGraw Hill<br>Company | 1985                |

**WEB SOURCES:**     <http://www.scitopia.org/scitopia>  
                               <http://portal.acm.org/portal.cfm>

### TEACHING METHODOLOGY

- Class room teaching
- Group discussions
- Seminars
- Chart/Assignment
- Simulation Model
- Smart Class room

### SYLLABUS DESIGNERS

1. Ms.A.SIVASANKARI, HOD, Dept of Computer Science
2. Ms.P.RAMYA, Assistant Professor, Dept of Computer Science
3. Mrs.B.ARULMOZHI, HOD, Dept of Computer Applications

#### OFFICE AUTOMATION LAB

| Semester | Subject Code | Category     | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|--------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |              | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE (PRACT) | 3           | 45      | 0          | 0       | 3         | 45      | 4       |

### COURSE OBJECTIVE

- This practical develops help us to learn MS Office.

### SYLLABUS

1. Word Processing: Creating doc file, edit, link, design – mail merge- macros – template – equation editor – flow chart design – customize – insert data base – savings file in different needs ( Web page, rft, text etc.,).
2. Spread sheet: Creating .xls file, edit, link, import data – formulas and functions – chart wizard – working with pivot tables – statistics and graphs.
3. Data base: creating database, data manipulation in access – statistics – forms and reports.

4. Presentation: creating power point presentation – customizing presentation – showing presentation, embedding sounds, animation, linking.

**Distribution of Marks: Program Output with Viva voce: 85% and Record:15%**

### **SYLLABUS DESIGNERS**

1. Ms.A.SIVASANKARI, HOD, Dept of Computer Science
2. Ms.P.SIVAGAMI, Assistant Professor, Dept of Computer Science
3. Mrs.B.ARULMOZHI, HOD, Dept of Computer Applications

### **INTERNET AND ITS APPLICATIONS**

| Semester | Subject Code | Category | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|----------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |          | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE     | 5           | 75      | 5          | 75      | 0         | 0       | 4       |

### **COURSE OBJECTIVE**

To equip students to basics of Internet usage and prepare them for digital world.

### **COURSE OUTCOME**

On the successful completion of the course, students will be able to

| CO Number  | CO Statement   | Knowledge Level (K1-K4) |
|------------|--|-------------------------|
| <b>CO1</b> | To learn Basic Concept of Internet.                        | K1                      |
| <b>CO2</b> | To learn how to use Web browser                            | K2                      |
| <b>CO3</b> | To learn how to use E-mail id -sending and Receiving mails | K3                      |
| <b>CO4</b> | Introduction to HTML.                                      | K2                      |
| <b>CO5</b> | To learn about E-marketing                                 | K3                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

### **MAPPING WITH PROGRAMME OUTCOME**

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | S   | S   | M   | S   | S   |
| <b>CO2</b> | S   | S   | M   | S   | M   | S   |
| <b>CO3</b> | S   | S   | S   | M   | S   | S   |
| <b>CO4</b> | S   | S   | S   | S   | M   | M   |
| <b>CO5</b> | S   | S   | S   | M   | M   | S   |

*S-Strong M-Medium L-Low*

## **SYLLABUS**

### **UNIT - I INTERNET BASICS**

**15 Hrs**

Introduction to Computers Programming Language types History of Internet Personal computers History of World Wide Web- Micro software .NET Java-Web resources.

### **UNIT - II WEB BROWSERS**

**16 Hrs**

Web Browsers - Internet Explorer - connecting to Internet Features of Internet explorer6 Searching the Internet- online help and tutorials - File Transmission Protocol (FTP) Browser settings.

### **UNIT - III E-MAIL**

**14 Hrs**

Attaching a file, Electronic mail creating an E-mail id sending and Receiving mails - attaching a file - Instance messaging - other web browsers.

### **UNIT - IV HTML**

**16 Hrs**

Introduction to HTML headers – Linking - Images-special characters and line breaks unordered lists- simple HTML programs.

### **UNIT - V DIGITAL CASH**

**14 Hrs**

E-marketing consumer tracking Electronic advertising search engine – CRM - credit card payments Digital cash and e-wallets micro payments- smart card

**Distribution of Marks: Theory :80% and Applications:20%**

### **TEXT BOOK**

| <b>S.No</b> | <b>Authors</b>                             | <b>Title</b>                                | <b>Publishers</b>     | <b>Year of Publication</b> |
|-------------|--|---|-----------------------|----------------------------|
| 1.          | A.M. Deitel and P.J. Deitel, A.B. Goldberg | Internet and world wide web: How to program | Pearson Education ltd | 2008                       |

### **REFERENCE BOOK**

| <b>S.No</b> | <b>Authors</b> | <b>Title</b> | <b>Publishers</b> | <b>Year of Publication</b> |
|-------------|----------------|--------------|-------------------|----------------------------|
| 1.          | Harley hahn    | The Internet | TMH               | Recent Publication         |

### **WEB RESOURCES**

- 1.[https://www.tutorialspoint.com/internet\\_technologies/internet\\_overview.htm](https://www.tutorialspoint.com/internet_technologies/internet_overview.htm)
- 2.[https://www.tutorialspoint.com/basics\\_of\\_computer\\_science/basics\\_of\\_computer\\_science\\_internet.htm](https://www.tutorialspoint.com/basics_of_computer_science/basics_of_computer_science_internet.htm)

## TEACHING METHODOLOGY

- Class room teaching
- Group discussions
- Seminars
- Chart/Assignment
- Simulation Model
- Smart Class room

## SYLLABUS DESIGNERS

1. Ms.A.SIVASANKARI , HOD, Dept of Computer Science
2. Mrs.P.SIVAGAMI, Assistant Professor, Dept of Computer Science
3. Mrs.B.ARULMOZHI, HOD, Dept of Computer Applications

## INTERNET AND ITS APPLICATIONS

| Semester | Category         | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|------------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |                  | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        | CORE (PRACTICAL) | 3           | 45      | 0          | 0       | 3         | 45      | 4       |

## COURSE OBJECTIVE

- This practical develops basic concept of Internet and its Applications.

## SYLLABUS

1. Create web page for showing Time Table.
2. Create a web page using Hyperlink concept.
3. Create a web page for showing list of item using ordered, unordered list and definition list.
4. Create a web page to add graphics images.
5. Create a web page for showing basic tags (Heading tag, Line break and hr tag).
6. Create a Email Account to send and receive messages.

7. Search information on a particular topic using search engine.
8. Online transaction (Application filling).

**Distribution of Marks: Program Output with Viva voce: 85% and Record:15%**

### **SYLLABUS DESIGNERS**

1. Ms.A.SIVASANKARI , HOD, Dept of Computer Science
2. Mrs.P.SIVAGAMI, Assistant Professor, Dept of Computer Science
3. Mrs.B.ARULMOZHI, HOD, Dept of Computer Applications

## **DEPARTMENT OF COMPUTER SCIENCE-PG**

### **M.Sc., COMPUTER SCIENCE**

#### **PROGRAMME EDUCATIONAL OBJECTIVES**

**PEO1:** Graduates will be able to perform in technical/managerial roles ranging from design, development, problem solving to production support in software industries and Research and development sectors.

**PEO2:** Graduates will have successful teaching/research careers in industry or academia and able to establish companies or lead teams/organizations to solve society relevant problems.

#### **PROGRAMME OUTCOME**

**PO1:** Ability to discriminate, evaluate, analyze and synthesize existing and new knowledge, and integration of the same for enhancement of knowledge in Computer Science and Applications.

**PO2:** Ability to apply usage of tools from optimization, probability, statistics, simulation, and economic analysis, including fundamental applications of those tools in IT industry.

**PO3:** Ability to review and consolidate learning, to evaluate performance, to plan future learning based on past learning experience and self-learning.

**PO4:** Ability to develop diverse technical knowledge and skills to formulate problems and projects and to plan a process for solution including economic analysis for project which involving uncertainty and scarce or expensive resources.

**PO5:** Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO6:** Ability to possess knowledge and understanding of group dynamics, recognize opportunities and demonstrate a capacity for self-management and teamwork, decision

making based on open-mindedness, objectivity and rational analysis in order to achieve common goals

## DEPARTMENT OF COMPUTER SCIENCE

### M.Sc., COMPUTER SCIENCE

#### The course of study and scheme of Examination

| SN<br>O   | PA<br>R<br>T | COURSE<br>TITLE |             | In<br>s/<br>Hr<br>s | Cr<br>ed<br>it | Title of the paper   | MAXIMUM MARKS |              |       |
|---|--------------|-----------------|-------------|---------------------|----------------|--|---------------|--------------|-------|
| SEMESTER-I  |              |                 |             |                     |                |  | CIA           | UNI.<br>EXAM | TOTAL |
| 1   | III          | Core(T)         | Paper-1     | 6                   | 4              | Enterprise Java Programming  | 25            | 75           | 100   |
| 2   | III          | Core(T)         | Paper-2     | 6                   | 4              | Linux Shell Programming  | 25            | 75           | 100   |
| 3   | III          | Core(T)         | Paper-3     | 6                   | 4              | Formal Languages and Automata theory   | 25            | 75           | 100   |
| 4   | III          | Elective-I      | Paper-1     | 6                   | 5              | 1.Big Data<br>2. Distributed Computing<br>3.Computer Architecture and Parallel Processing. | 25            | 75           | 100   |
| 5   | III          | Core practical  | Practical-1 | 3                   | 3              | Enterprise Java programming  | 40            | 60           | 100   |
| 6   | III          | Core practical  | Practical-2 | 3                   | 3              | Linux Shell Programming  | 40            | 60           | 100   |
|   |              | TOTAL           |             | 30                  | 23             |  | 180           | 420          | 600   |
| Self Study Paper: R Programming during 1 <sup>st</sup> Semester with extra Credit = 2 |              |                 |             |                     |                |  |               |              |       |



| SEMESTER II   |     |                  |             |    |    |  | CIA | UNI.E<br>XAM | TOTA<br>L |
|---|-----|------------------|-------------|----|----|--|-----|--------------|-----------|
| 7   | III | Core(T)          | Paper-4     | 6  | 4  | JSP and Servlet Programming  | 25  | 75           | 100       |
| 8   | III | Core(T)          | Paper-5     | 6  | 4  | Advanced Database Management System  | 25  | 75           | 100       |
| 9   | III | Core(T)          | Paper-6     | 5  | 4  | Principles of Compiler Design  | 25  | 75           | 100       |
| 10  | III | Core practical   | Practical-3 | 3  | 3  | JSP and Servlet Programming  | 40  | 60           | 100       |
| 11  | III | Core practical   | Practical-4 | 3  | 3  | Advanced Database Management System  | 40  | 60           | 100       |
| 12  | III | Compulsory paper | Paper       | 2  | 2  | Human Rights   | 25  | 75           | 100       |
| 13  | III | Elective         | Paper-2     | 5  | 5  | 1.Computer Networks<br>2.Object Oriented Analysis & Design<br>3.Multimedia | 25  | 75           | 100       |
|   |     | TOTAL            |             | 30 | 25 |  | 205 | 495          | 700       |
| Online Course during 2 <sup>nd</sup> Semester extra credit = 2                  |     |                  |             |    |    |  |     |              |           |
| Internship Training and Project during summer vacation with an extra credit = 3 |     |                  |             |    |    |  |     |              |           |

**TOTAL CREDITS****M.Sc (COMPUTER SCIENCE)**

| SUBJECT        | PAPERS | CREDIT | TOTAL CREDITS | MARKS | TOTAL MARKS |
|----------------|--------|--------|---------------|-------|-------------|
| MAIN (CORE)    | 9      | 4      | 36            | 100   | 900         |
| ELECTIVE       | 4      | 5      | 20            | 100   | 400         |
| MAIN PRACTICAL | 6      | 3      | 18            | 100   | 600         |
| HUMAN RIGHTS   | 1      | 2      | 2             | 100   | 100         |
| MINI PROJECT   | 1      | 4      | 4             | 100   | 100         |
| MAJOR PROJECT  | 1      | 10     | 10            | 200   | 200         |
| TOTAL          | 22     | -      | 90            | -     | 2300        |

**ENTERPRISE JAVA PROGRAMMING**

| Semester | Subject Code | Category       | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|----------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |                | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE PAPER - 1 | 6           | 90      | 6          | 90      | 0         | 0       | 4       |

**COURSE OBJECTIVE**

➤ This paper help us to understand the advanced level of enterprise java programming concept.

**COURSE OUTCOME**

successful completion of the course, students will be able to

| <b>CO Number</b> | <b>CO Statement</b>                                    | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| <b>CO1</b>       | Understand the J2EE concepts                           | K2                             |
| <b>CO2</b>       | Deals with JSP Components                              | K2                             |
| <b>CO3</b>       | To learn Enterprise beans and web client usage         | K3                             |
| <b>CO4</b>       | To apply Struts flow concept in real time application. | K3                             |
| <b>CO5</b>       | To analyze Hibernate in detail                         | K4                             |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

### **MAPPING WITH PROGRAMME OUTCOME**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | M          | S          |
| <b>CO2</b> | S          | S          | M          | S          | S          | M          |
| <b>CO3</b> | S          | S          | S          | M          | M          | S          |
| <b>CO4</b> | S          | S          | S          | M          | S          | M          |
| <b>CO5</b> | S          | M          | S          | S          | M          | M          |

*S-Strong , M-Medium and L-Low*

## **SYLLABUS**

### **UNIT-I INTRODUCTION**

**18 Hrs**

Introduction -Enterprise Architecture Styles - J2EE Architecture - Containers - J2EE Technologies - Developing J2EE Applications - Naming and directory services - Using JNDI - Implementing the J2EE Specifications - J2EE packaging and Deployment - J2EE packaging overview - Configuring J2EE packages

### **UNIT-II CONCEPT OF JSP**

**19 Hrs**

JSP Benefits - Framework roles - Simple JSF application - User Interface Component Model - Navigational Model - Life Cycle of JSF page - Using JSF in JSP Pages – Setting up a page, using core tags - using HTML tags - using localized messages - Using converters.

**UNIT-III INTRODUCTION TO ENTERPRISE BEANS****18 Hrs**

Introduction to Enterprise Beans - Session Bean - Entity Bean - Message driven Bean - defining clients access with interfaces - contents of an enterprise Bean - life cycle of enterprise Bean - creation of Enterprise Bean - application client - web client - other Enterprise Bean features handling exceptions.

**UNIT-IV STRUTS****17 Hrs**

Struts Architecture - Struts classes - Action Forward, Action Form, Action Servlet, Action classes - Understanding struts - Understanding Action Mappings, Struts flow with an example application.

**UNIT-V HIBERNATE****18 Hrs**

Hibernate - Architecture of Hibernate - Life cycle of Hibernate Entities- Exploring HQL - Understanding Hibernate O/R Mapping - Collection Mapping - Association Mapping - Relationships in Java and Databases.

**Distribution of Marks: Theory 80% and Applications: 20%**

**TEXT BOOKS**

| S.NO | AUTHORS                 | TITLE   | PUBLISHERS                        | YEAR OF PUBLICATION |
|------|-------------------------|---|-----------------------------------|---------------------|
| 1    | Marty Hall, Larry Brown | Core Servlets and Java Server Pages                             | 2nd Edition, Pearson Education    | 2004                |
| 2    | Stephanie Bodoffetl     | The J2EE TM Tutorial  | Pearson Education, Second Edition | 2005                |
| 3    | Minter Dave             | Linwood Jeff, "Beginning Hibernate, From Novice to Professional | Apress, Second Edition            | 2006                |

**REFERENCE BOOKS**

| S.NO | AUTHORS                           | TITLE                          | PUBLISHERS       | YEAR OF PUBLICATION |
|------|-----------------------------------|--------------------------------|------------------|---------------------|
| 1    | Patrick Naughton& Herbert Schildt | The Complete Reference: Java 2 | Tata McGraw Hill | 1999                |
| 2    | Bruce W.Perry                     | Java Servlet and JSP Cook Book | O'Reilly         | 2004.               |

**WEB RESOURCES**

7. <http://www.tutorialspoint.com/hibernate/>
8. <https://javaee.github.io/tutorial/overview001.html>

## TEACHING METHODOLOGY

- Class room teaching & Group discussions
- Seminars & Smart Class room
- Chart/Assignment & Simulation Model

## SYLLABUS DESIGNER

- 1.Ms. A.SIVASANKARI, HOD, Dept of Computer Science
- 2.Mrs. P.MOHANA LAKSHMI, Assistant Prof, Dept of Computer Science
3. Mrs. B.ARULMOZHI, HOD, Dept of Computer Applications

## ENTERPRISE JAVA PROGRAMMING

| Semester | Subject Code | Category         | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|------------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |                  | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE (PRACT) - 1 | 3           | 4       | 0          | 0       | 3         | 45      | 3       |

## COURSE OBJECTIVE

➤ This practical helps us to develop the projects using enterprise java programming concept.

## SYLLABUS

1. Simple JSF application using JSP in JSF
2. HTML render kit in JSF
3. Core render kit in JSF
4. Creating Enterprise Bean
5. Creating Web Client
6. Using Session Bean
7. Struts Action
8. Struts Forward Action
9. Object Relational Mapping
10. Collection Mapping

**Distribution of Marks: Program Output with Viva voce: 85% and Record:15%**

**SYLLABUS DESIGNER**

1. Ms. A.SIVASANKARI, HOD, Dept of Computer Science
2. Mrs. P.SIVAGAMI, Assistant Prof, Dept of Computer Science
3. Mrs. B.ARULMOZHI, HOD, Dept of Computer Applications

**LINUX SHELL PROGRAMMING**

| Semester | Subject Code | Category       | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|----------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |                | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE PAPER - 2 | 6           | 90      | 6          | 90      | 0         | 0       | 4       |

**COURSE OBJECTIVE**

- This paper help us to understand and make effective use of Linux utilities and Shell scripting language (bash) to solve real time applications.

**COURSE OUTCOME**

successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | Understand about Linux history, Linux architecture, GNU, Free software foundation.                   | K2                      |
| CO2       | Writing simple Shell scripts, Work with files using shell Understand/Apply scripts.                  | K3                      |
| CO3       | Design and develop shell programming, communication, System calls and terminology.                   | K2                      |
| CO4       | Understand about processes, process structure using shell Understand/Apply Scripts                   | K3                      |
| CO5       | Understand sockets and Create network based Understand/Apply applications using TCP and UDP sockets. | K4                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

**MAPPING WITH PROGRAMME OUTCOME**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | M   | S   | M   |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO2</b> | S | M | S | M | M | M |
| <b>CO3</b> | S | M | S | S | S | S |
| <b>CO4</b> | S | S | M | M | S | S |
| <b>CO5</b> | S | S | M | S | S | S |

*S-Strong , M-Medium L-Low*

## **SYLLABUS**

### **UNIT I – BASICS OF LINUX OPERATING SYSTEM**

**19Hrs**

Introduction to Linux System - History of Emergency – Features of Linux System – Hardware Requirements for the Different Version of Linux - Architecture of Linux – Features of Kernal and Kernal Shell Relationship – Linux File System – Features of Linux File System – File Types and Permissions – Getting Started – Logging In/Out with the Concept of Home Directory – File Operation and Links – Commonly Used Commands like grep, find, who, ls, pwd, mv, cd, df, cat, head, tail, sort, grip, chmod and date.

### **UNIT II – LINUX COMMANDS**

**18 Hrs**

Text Processing – Vi Editor – Vi Features – Vi Commands – Yanking, Running Shell Commands from within Vi – Set Show Mode - Set Auto Indent – Set Number – Emacs Editor – Emacs Features – Emacs Commands Using Cut, Paste And Copy In Emacs – Saving Buffer In Emacs.

### **UNIT III – SHELL PROGRAMMING**

**18 Hrs**

Shell Programming – Features of Shell – Different Types of Shell – Shell Treatment to the Command Line – The Environment – Set Setenv, Path, Home, IFS, Mail, PS1, PS2, Term, Log Name, Profile File, Login And Logout File – Setting Environment – Simple Shell Programs for, do, do while, case, construct.

### **UNIT IV – WINDOWS OPERATING SYSTEM**

**17 Hrs**

X-Windows – Microsoft Windows Versus X-Windows, Windows Manager – FVWM and FVWM 95 – Twn, The Client Server Model Of X-Windows – Starting and Stopping X-Windows Sessions.

### **UNIT V – GNOME AND KDE**

**18 Hrs**

Gnome And KDE Desktop Environment – Starting the Gnome Desktop Environment – Gnome Panel Using the Main System Menu – File Manager – Getting Help In Gnome Using the Gnome Control – History of KDE Project – Starting the KDE Desktop Environment – Exploring the KDE Desktop – KDE Main System Menu Using

File Manager Window – Setting Wallpaper, Screensaver in KDE – System Administration Of Linux – Red Hat Linux Installation.

**Distribution of Marks: Theory 80% and Applications: 20%**

### TEXT BOOKS

| S.NO | AUTHORS  | TITLE                                  | PUBLISHERS       | YEAR OF PUBLICATION |
|------|--|--|------------------|---------------------|
| 1    | Wale Soyinka.                                    | Linux Administration A Beginners Guide | Tata McGraw-Hill | 2009                |
| 2    | N.Matthew, R.Stones, Wrox, Willey India Edition. | Beginning Linux Programming            | Willey India     | 2009                |
| 3    | <u>Richard Petersen</u>                          | The Complete Reference                 | MC Graw Hill     | 2008                |

### REFERENCE BOOK

| S.NO | AUTHORS        | TITLE  | PUBLISHERS    | YEAR OF PUBLICATION |
|------|----------------|--|---------------|---------------------|
| 1    | Mark G. Sobell | Practical Guide to Fedora and Red Hat Enterprise Linux | Prentice Hall | 2011                |

### WEB RESOURCES

1. [www.linuxhomenetworking.com](http://www.linuxhomenetworking.com)
2. [www.linux.com](http://www.linux.com)

### TEACHING METHODOLOGY

- Class room teaching & Group discussions
- Seminars & Smart Class room
- Chart/Assignment & Simulation Model

### SYLLABUS DESIGNERS

1. Ms. A.SIVASANKARI, HOD, Dept of Computer Science
2. Ms. G.ARUNKUMARI, Assistant Prof, Dept of Computer Science
3. Mrs. B.ARULMOZHI, HOD, Dept of Computer Applications



## LINUX SHELL PROGRAMMING

| Semester | Subject Code | Category       | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|----------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |                | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE PRACT - 2 | 3           | 45      | 0          | 0       | 3         | 45      | 3       |

### COURSE OBJECTIVE

➤ This practical helps us to develop the project related to linux operating system concept.

### SYLLABUS

1. Prime Test.
2. Palindrome Test.
3. Fibonacci Series generation.
4. Armstrong No Test.
5. Solving Quadratic Equation.
6. Menu Driven Shell Script - Sort with various options.
7. User friendly change of modes (chmod).
8. Usage of case structures.
9. Process Scheduling.
  - a) FCFS
  - b) SJF
  - c) Priority
  - d) Round Robin
10. Inter process communications using message Queues & Pipes.
11. Using Pipes to calculate NCR.
12. Applications for functions, Procedures & Macros.

**Distribution of Marks: Program Output with Viva voce: 85% and Record: 15%**

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3. Mrs. B.ARULMOZHI, HOD, Dept of Computer Applications

## FORMAL LANGUAGES AND AUTOMATA THEORY

| Semester | Subject Code | Category      | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|---------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |               | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | CORE PAPER- 3 | 6           | 90      | 6          | 90      | 0         | 0       | 4       |

### COURSE OBJECTIVE

➤ This course presents the theory of finite automata, as the first step towards learning advanced topics, such as compiler design. Apply the concepts learned in fundamental courses such as Discrete Mathematics, in a theoretical setting; in particular, the application of proof techniques.

### COURSE OUTCOME

Successful completion of the course, students will be able to

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | The ability to prove results using proof by induction, proof by contradiction, proof by construction.   | K2                      |
| CO2       | Ability to describe various automata theoretic models for recognizing formal languages and transform regular expressions and grammars.  | K2                      |
| CO3       | Distinguish different computing languages and classify their respective types.  | K3                      |
| CO4       | Able to construct pushdown automata and the equivalent context free grammars and prove the equivalence of the languages described by pushdown automata and context free grammars. | K4                      |
| CO5       | Able to design Turing Machine and prove the equivalence of the languages described by Turing machines.  | K4                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

### MAPPING WITH PROGRAMME OUTCOME

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | S   | S   | S   |
| CO2 | S   | M   | S   | S   | S   | M   |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO3</b> | S | S | S | M | S | S |
| <b>CO4</b> | S | S | S | S | S | S |
| <b>CO5</b> | S | M | S | M | S | M |

*S-Strong , M-Medium and L-Low*

## **FORMAL LANGUAGES AND AUTOMATA THEORY**

### **SYLLABUS**

#### **UNIT-I FUNDAMENTALS**

**18 Hrs**

Fundamentals - String, Alphabets, Operations, Finite State Machine – Definitions, Divisibility by Three Tester - Set Theory – Relations – Functions - Counting Techniques –Logic - Methods of Proof.

#### **UNIT-II FINITE AUTOMATA**

**18 Hrs**

Finite Automata –Deterministic and Nondeterministic Finite Automata – Equivalence of NFA and DFA – Finite Automata with Outputs – Finite Automata with Null Moves – Finite Automata and Sequential Circuits

#### **UNIT - III CLASSIFICATION OF GRAMMERS**

**19 Hrs**

Chomsky classification of grammars -Regular Expression – Relation between Regular languages and Finite Automata- Closure Properties – Automata for Union, Intersection and Difference of Languages – Context free grammars – Normal forms for Context Free Grammar – Parse Trees – Ambiguity Grammars – Removing Ambiguity from Grammars

#### **UNIT-IV BASIC STRUCTURE OF PDA**

**17 Hrs**

Basic Structure – Types of Acceptance by PDA – Correspondence between PDA and CFL – Parsing and PDA -Languages of PDA – Equivalence of PDA and CFG – Deterministic PDA

#### **UNIT-V BASIC STRUCTURE OF TM**

**18 Hrs**

Basic structure of TM – Instantaneous Description of Turing Machine – Language of TM – Turing Machine as Computer for Positive Integer- Universal Turing Machine – Turing Machine for 1's Complement, 2's Complement- TM for Well Formed Parenthesis – TM for Unary addition and Multiplication – TM for Palindrome Recognition – TM for GCD – TM for  $0^n1^n$ .

**Distribution of Marks: Theory 70% and Problem 30%**

**TEXT BOOKS**

| S. NO | AUTHORS             | TITLE  | PUBLISHERS                      | YEAR OF PUBLICATION |
|-------|---------------------|--|---------------------------------|---------------------|
| 1     | C.K. Nagpal         | Formal Languages and Automata Theory                       | Oxford University Press         | 2013                |
| 2     | Hopcroft and Ullman | Introduction to Automata Theory, Languages and Computation | Narosa Publishing House, Delhi. | 2002                |
| 3     | E.V. Krishnamurthy  | Theory of Computer Science                                 | East West Press Pvt. Ltd.       | 1985                |

**REFERENCE BOOKS**

| S. NO | AUTHORS         | TITLE  | PUBLISHERS              | YEAR OF PUBLICATION |
|-------|-----------------|--|-------------------------|---------------------|
| 1.    | Juruj Hromkovic | Theoretical computer Science                               | Springer Indian Reprint | 2010                |
| 2.    | John E.Hocroft  | Introduction to Automata Theory, Languages and Computation | Paperback               | 2008                |
| 3.    | K.V.N. Sunitha  | Formal Languages and Automata Theory                       | Paperback               | 2015                |
| 4     | A.A Puntambekar | Formal Languages and Automata Theory for JNTU              | Paperback               | 2015                |

**WEB RESOURCES**

1. [www.nptel.ac.in](http://www.nptel.ac.in)
2. <https://www.geeksforgeeks.org/theory-of-computation-automata-tutorials/>

**TEACHING METHODOLOGY**

- Class room teaching & Group discussions
- Seminars & Smart Class room
- Chart/Assignment & Simulation Model

### SYLLABUS DESIGNERS

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2. Mrs. G.SANGEETHA LAKSHMI Assistant Prof, Dept of Computer Applications
3. Mrs. B.ARULMOZHI, HOD, Dept of Computer Applications

### BIG DATA

| Semester | Subject Code | Category     | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|--------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |              | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | ELECTIVE - 1 | 5           | 75      | 5          | 75      | 0         | 0       | 5       |

### COURSE OBJECTIVE

This course aims at facilitating the student to explore and understand the Big data platform, its architecture and its technology foundations. Work on hadoop platform. Perform mining and analysis on massive data using certain techniques. Also perform analysis through mining techniques.

### COURSE OUTCOME

successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | Understanding the Needs of big data                              | K2                      |
| CO2       | Developing map reduce concepts.                                  | K3                      |
| CO3       | Analyzing the mining of data stream concept.                     | K3                      |
| CO4       | Evaluate the relationships or connections between network nodes. | K4                      |
| CO5       | The Concept of Big Data as Presented Through Social Media.       | K4                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

### MAPPING WITH PROGRAMME OUTCOME

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | M   | M   | M   |
| CO2 | S   | S   | S   | S   | S   | M   |
| CO3 | S   | M   | S   | M   | S   | S   |
| CO4 | S   | S   | M   | S   | M   | S   |
| CO5 | S   | S   | M   | M   | S   | S   |

*S-Strong, M-Medium and L-Low*

### SYLLABUS

#### UNIT I: INTRODUCTION TO BIG DATA

**15 Hrs**

**Introduction to Big Data**- Big Data Characteristics- Types of Big Data- Traditional Versus Big Data Approach - Technologies Available for Big Data – Hadoop – Introduction - What is Hadoop? - Core Hadoop Components - Hadoop Ecosystem - Physical Architecture - Hadoop Limitations

#### Unit II: HADOOP AND MAPREDUCE

**12 Hrs**

**MapReduce** - MapReduce and The New Software Stack- MapReduce- Algorithms Using MapReduce - Finding Similar Items – Introduction - Nearest Neighbor Search - Applications of Nearest Neighbor Search- Similarity of Documents - Collaborative Filtering as a Similar-Sets Problem - Recommendation Based on User Ratings- Distance Measures.

#### UNIT III: MINING DATA STREAMS

**16 Hrs**

**Mining Data Streams** – Introduction- Data Stream Management Systems- Data Stream Mining - Examples of Data Stream Applications - Stream Queries- Issues in Data Stream Query Processing - Sampling in Data Streams - Filtering Streams - Counting Distinct Elements in a Stream- Querying on Windows – Counting Ones in a Window -Decaying Windows.

#### UNIT IV: LINK ANALYSIS

**18 Hrs**

**Link Analysis** - Introduction- History of Search Engines and Spam –PageRank - Efficient Computation of PageRank - Topic-Sensitive PageRank- Link Spam- Hubs and Authorities Recommendation Systems - Introduction - A Model for Recommendation

Systems - Collaborative-Filtering System - Content-Based Recommendations - Mining Social Network Graphs .

#### **UNIT V: APPLICATIONS OF SOCIAL NETWORK MINING**

**14 Hrs**

**Introduction** - Applications of Social Network Mining - Social Networks as a Graph - Types of Social Networks - Clustering of Social Graphs - Direct Discovery of Communities in a Social Graph - Sim Rank-Counting Triangles in a Social Graph

**Distribution of Marks: Theory 70% and Applications 30%****TEXT BOOKS**

| <b>S. NO</b> | <b>AUTHORS</b>                     | <b>TITLE</b>       | <b>PUBLISHERS</b>                  | <b>YEAR OF PUBLICATION</b> |
|--------------|------------------------------------|--------------------|------------------------------------|----------------------------|
| 1            | Radha Shankarmani, M Vijayalakshmi | Big Data Analytics | Wiley Publications, first Edition, | 2016                       |

#### **REFERENCE BOOKS**

| <b>S. NO</b> | <b>AUTHORS</b>                       | <b>TITLE</b>   | <b>PUBLISHERS</b>                             | <b>YEAR OF PUBLICATION</b> |
|--------------|--------------------------------------|--|---|----------------------------|
| 1            | Seema Acharya, Subhashini Chellappan | Big Data and Analytics   | Wiley Publication first edition               | Reprint in 2016            |
| 2            | Hive, Yarn, PIG,                     | Black Book- Big Data(Covers Hadoop,MapReduce, R, Data visualization) | DT Editorial Services Dream techPress edition | 2016                       |

#### **WEB RESOURCES**

1. [https://www.sas.com/en\\_us/insights/big-data/what-is-big-data.html](https://www.sas.com/en_us/insights/big-data/what-is-big-data.html)
2. [https://www.tutorialspoint.com/big\\_data\\_tutorials.htm](https://www.tutorialspoint.com/big_data_tutorials.htm)

#### **TEACHING METHODOLOGY**

- Class room teaching & Group discussions
- Seminars & Smart Class room

- Chart/Assignment & Simulation Model

### SYLLABUS DESIGNERS

1. Ms. A.SIVASANKARI, HOD, Dept of Computer Science
2. Mrs. M.MALATHI Assistant Prof, Dept of Computer Applications
3. Mrs. B.ARULMOZHI, HOD, Dept of Computer Applications

### DISTRIBUTED COMPUTING

| Semester | Subject Code | Category     | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|--------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |              | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | ELECTIVE - 1 | 5           | 75      | 5          | 75      | 0         | 0       | 5       |

### COURSE OBJECTIVE

- To Know about the network Concept and Gain the knowledge in developing the System using Distributed Concept .

### COURSE OUTCOME

successful completion of the course, students will be able to

| CO Number  | CO Statement  | Knowledge Level (K1-K4) |
|------------|---|-------------------------|
| <b>CO1</b> | To learn the characteristics, examples and design issues, trends related to distributed systems | K2                      |
| <b>CO2</b> | Develop Inter Process Communication   | K3                      |
| <b>CO3</b> | To learn about synchronization and deadlock concept with real time example.                     | K3                      |
| <b>CO4</b> | To apply process allocations using thread based techniques.                                     | K4                      |
| <b>CO5</b> | Implement a distributed file system for a given Operating System.                               | K4                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

### MAPPING WITH PROGRAMME OUTCOME



| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>C01</b> | S          | M          | M          | M          | S          | S          |
| <b>C02</b> | S          | S          | M          | S          | S          | M          |
| <b>C03</b> | S          | S          | S          | M          | M          | S          |
| <b>C04</b> | S          | S          | S          | M          | S          | M          |
| <b>C05</b> | S          | S          | S          | M          | S          | S          |

*S-Strong, M-Medium and L-Low*

## **SYLLABUS**

### **UNIT – I INTRODUCTION TO DISTRIBUTED COMPUTING 15 HRS**

Introduction – Goals - Hardware Concepts – Software Concepts – Design Issues: Transparency – Flexibility – Reliability – Performance – Scalability.

### **UNIT – II COMMUNICATION IN DISTRIBUTED SYSTEM 16 HRS**

Communication in Distributed Systems – The Client – Server Model – Addressing – Types of Primitives – Implementation – Group Communication – Introduction – Design Issues – Group Communication in ISIS.

### **UNIT – III SYNCHRONIZATION 14 HRS**

Synchronization in Distributed Systems – Clock Synchronization – Mutual Exclusion – Election Algorithms – Deadlocks.

### **UNIT – IV PROCESS IN DISTRIBUTED SYSTEM 15 HRS**

Process and Processors in Distributed Systems – Threads – Processor Allocation – Scheduling – Fault Tolerance.

### **UNIT – V DISTRIBUTED FILE SYSTEM 15 HRS**

Distributed File System – Design – Implementation – Trends in Distributed File Systems.

**Distribution of Marks: Theory 80% and Applications: 20%**

## **TEXT BOOKS**

| <b>S. NO</b> | <b>AUTHORS</b>    | <b>TITLE</b>                  | <b>PUBLISHERS</b>                          | <b>YEAR OF PUBLICATION</b> |
|--------------|-------------------|-------------------------------|--|----------------------------|
| <b>1</b>     | Andrew S Tanebaum | Distributed Operating Systems | PHI/Pearson Education Pte. Ltd., New Delhi | 2006                       |

## REFERENCE BOOKS

| S. NO | AUTHORS  | TITLE   | PUBLISHERS        | YEAR OF PUBLICATION |
|-------|--|---|-------------------|---------------------|
| 1     | George Coulouris, Jean Dollimore, Tim Kindberg | “Distributed Systems Concepts and Design”           | Fifth edition     | 2011                |
| 2     | Liu M.L.,                                      | “Distributed Computing, Principles and Applications | Pearson Education | 2007                |

## WEB RESOURCES

1. <https://whatis.techtarget.com/definition/distributed-computing>
2. [https://computing.llnl.gov/tutorials/parallel\\_comp/](https://computing.llnl.gov/tutorials/parallel_comp/)

## TEACHING METHODOLOGY

- Class room teaching & Group discussions
- Seminars & Smart Class room
- Chart/Assignment & Simulation Model

## SYLLABUS DESIGNERS

1. Ms. A.SIVASANKARI, HOD, Dept of Computer Science
2. Mrs. V.LAKSHMI PRATHA Assistant Prof, Dept of Computer Science
3. Mrs. B.ARULMOZHI, HOD, Dept of Computer Applications

## COMPUTER ARCHITECTURE AND PARALLEL PROCESSING

| Semester | Subject Code | Category     | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|--------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |              | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | ELECTIVE - 1 | 5           | 75      | 5          | 75      | 0         | 0       | 5       |

## COURSE OBJECTIVE

- This paper helps us to understand the advanced level of Computer Architecture and Parallel Processing.

## COURSE OUTCOME

successful completion of the course, students will be able to

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To learn about computer architecture and different types of processing.     | K2                      |
| CO2       | To understand the principles of pipeline processors and vectors processing. | K3                      |
| CO3       | Implementation of SIMD and associative array processing.                    | K2                      |
| CO4       | To learn about the multiprocessor architecture and programming.             | K3                      |
| CO5       | Understanding and Analyzing Multi-process Scheduling Algorithms             | K4                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

## MAPPING WITH PROGRAMME OUTCOME

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | M   | M   |
| CO2 | S   | S   | S   | M   | S   | M   |
| CO3 | S   | S   | M   | S   | M   | M   |
| CO4 | S   | S   | S   | M   | S   | S   |
| CO5 | S   | M   | S   | M   | S   | M   |

*S-Strong, M-Medium and L-Low*

## SYLLABUS

### UNIT I – COMPUTER ARCHITECTURE INTRODUCTION

**16 Hrs**

Introduction - Evolution of Computer systems - Trends of Parallel Processing - Parallelism in Uniprocessor Systems - Architecture, Mechanisms, Multiprogramming and Timesharing - Parallel Computer Structures - Pipeline, Array, Multiprocessor,

Performance of Parallel computer, Data Flow - Architectural Classification - Applications.

## **UNIT II – PARALLEL PROCESSING**

**16 Hrs**

An Overlapped Parallelism - Instruction and Arithmetic Pipelines - Principles of Designing Pipeline Processors - Instructions Prefetch and Branch Handling, Data Buffering and Busing Structures – Job Sequencing and Collision Prevention - Vector Processing Requirements - Characteristics of Vector Processing, Pipelined Vector Processing Methods.

## **UNIT III – PROCESSORS**

**14 Hrs**

SIMD Array Processors - SIMD Interconnection Networks - Associative Array Processing.

## **UNIT IV – MULTIPROCESSOR ARCHITECTURES**

**14 Hrs**

Multiprocessor Architecture and Programming: Functional Structures- Interconnection Networks- Parallel Memory Organization.

## **UNIT V - MULTIPROCESSOR OPERATING SYSTEMS**

**15 Hrs**

Multiprocessor Operating Systems- Interprocessor Communication Mechanisms-Multiprocessor Scheduling Strategies-Parallel Algorithms for Multiprocessors.

**Distribution of Marks: Theory 70% and Problem 30%**

### **TEXT BOOKS**

| <b>S. NO</b> | <b>AUTHORS</b>            | <b>TITLE</b>                                  | <b>PUBLISHERS</b>        | <b>YEAR OF PUBLICATION</b> |
|--------------|---------------------------|---|--------------------------|----------------------------|
| 1            | Kai Hwang, Faye A. Briggs | Computer Architecture and Parallel Processing | McGraw Hill book company | 1985                       |
| 2            | John P. Hayes             | Computer Architecture and Organization        | MCH                      | 1988                       |

### **REFERENCE BOOKS**

| <b>S. NO</b> | <b>AUTHORS</b>                  | <b>TITLE</b>                         | <b>PUBLISHERS</b> | <b>YEAR OF PUBLICATION</b> |
|--------------|---------------------------------|--------------------------------------|-------------------|----------------------------|
| 1            | V. Rajaraman, C. Sivaram Murthy | Parallel Computers Architectures and | PHI               | 2003                       |

|   |                          |   |                  |      |
|---|--------------------------|---|------------------|------|
|   |                          | Programming                                       |                  |      |
| 2 | Michael J. Quinn         | Parallel computing theory and practice            | Tata McGraw Hill | 2002 |
| 3 | Wilkinson, Michael Allen | Parallel programming: techniques and Applications | Prentice hall    | 1999 |

### WEB RESOURCES

1. <https://www.class-central.com/course/nptel-computer-organization-and-architecture-a-pedagogical-aspect-9824>
2. <https://www.class-central.com/course/nptel-computer-organization-and-architecture-a-pedagogical-aspect-9824>
3. <https://www.mooc-list.com/tags/parallel-programming>

### TEACHING METHODOLOGY

- a. Class room teaching & Group discussions
- b. Seminars & Smart Class room
- c. Chart/Assignment & Simulation Model

### SYLLABUS DESIGNERS

1. Ms. A.SIVASANKARI, HOD, Dept of Computer Science
2. Mrs. S.SHANTHI Assistant Prof, Dept of Computer Science
3. Mrs. B.ARULMOZHI, HOD, Dept of Computer Applications

### R PROGRAMMING

| Semester | Subject Code | Category         | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|------------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |                  | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| I        |              | SELF STUDY PAPER | 0           | 0       | 0          | 0       | 0         | 0       | 2       |

### COURSE OBJECTIVE

- This paper helps us to develop the skill in R programming.

### COURSE OUTCOME

successful completion of the course, students will be able to

| <b>CO Number</b> | <b>CO Statement</b>                                 | <b>Knowledge Level (K1-K4)</b> |
|------------------|---|--------------------------------|
| CO1              | Learning about history of R programming language    | K1                             |
| CO2              | Remembering Data types and various operations in R. | K2                             |
| CO3              | Understand Control structures and functions in R    | K3                             |
| CO4              | Apply the R tools Concept in Real life.             | K3                             |
| CO5              | Implement R concept in various application program. | K4                             |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

#### **MAPPING WITH PROGRAMME OUTCOME**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | M          | M          | M          | M          |
| <b>CO2</b> | S          | S          | S          | M          | S          | M          |
| <b>CO3</b> | S          | S          | S          | M          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | M          | S          | M          | S          | S          |

*S-Strong, M-Medium and L-Low*

#### **SYLLABUS**

##### **UNIT -1 HISTORY OF R**

Introduction: Overview and History of R, Getting Help

##### **UNIT – 2 DATA TYPES AND OPERATIONS**

Data Types, Subsetting, Vectorized Operations, Reading and Writing Data

##### **UNIT – 3 CONTROL STRUCTURES AND FUNCIONS**

Control Structures, Functions, la pply, tapply, split, mapply, apply, Coding Standards.

##### **UNIT-4 TOOLS IN R**

**Scoping Rules, Debugging Tools, Simulation, R Profiler**

##### **UNIT-5 PROGRAMS**

1. Write a program that prints 'Hello World' to the screen.

2. Write a program that asks the user for a number n and prints the sum of the numbers 1 to n
3. Write a program that prints a multiplication table for numbers up to 12.
4. Write a function that returns the largest element in a list.
5. Write a function that computes the running total of a list.
6. Write a function that tests whether a string is a palindrome

#### TEXT BOOKS

| S. NO | AUTHORS                     | TITLE                | PUBLISHERS  | YEAR OF PUBLICATION |
|-------|-----------------------------|----------------------|-------------|---------------------|
| 1     | W. N. Venables, D. M. Smith | An Introduction to R | R-core team | 2015                |

#### WEB RESOURCES

<https://www.guru99.com/r-tutorial.html>

#### TEACHING METHODOLOGY – SELF STUDY

#### SYLLABUS DESIGNERS

1. Ms. A.SIVASANKARI, HOD, Dept of Computer Science
2. Mrs. B.ARULMOZHI, HOD, Dept of Computer Applications

#### JSP AND SERVLET PROGRAMMING

| Semester | Subject Code | Category       | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|----------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |                | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| II       |              | CORE PAPER - 4 | 6           | 90      | 6          | 90      | 0         | 0       | 4       |

#### COURSE OBJECTIVE

➤ This paper helps us to develop the projects in Web Application using JSP and Servlets.

#### COURSE OUTCOME

successful completion of the course, students will be able to

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| CO1              | Basic details of Java Script, Functions and Objects.           | K2                             |
| CO2              | Develop JDBC Connections and RMI Architecture.                 | K3                             |
| CO3              | Design and implement JSP Programs.                             | K3                             |
| CO4              | Implement Servlet programs and attributes in web applications. | K3                             |
| CO5              | Identify Web application framework using Struts.               | K4                             |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

#### **MAPPING WITH PROGRAMME OUTCOME**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | M          | M          | M          | M          |
| <b>CO2</b> | S          | S          | S          | M          | S          | M          |
| <b>CO3</b> | S          | S          | S          | M          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | M          | S          | M          | S          | S          |

*S-Strong, M-Medium and L-Low*

### **SYLLABUS**

#### **UNIT-I JAVA SCRIPT**

**17 Hrs**

Introduction to JavaScript - Operator - Conditional Structure & Looping – Structure - Dialog Boxes – Arrays- User Define Function - Built-in Functions: String Functions, Math Functions, Date Functions – Array: Join, reverse, pop, push, shift, sort- User Define Object, Document Object, History Object, Navigator Object, Form Object & Elements- Events.

#### **UNIT-II DATA BASE PROGRAMMING WITH JDBC**

**18 Hrs**

Introduction and Need for JDBC - Database Drivers -JDBC APIs for database Connectivity (Java. sql Package) Connection - Statement -Prepared statement - Callable statement - Result set -Other JDBC APIs -Database Meta Data - Result Set Meta Data-Distributed Computing Using RMI: Introduction to RMI - RMI Architecture - Stubs and Skeleton.



### **UNIT-III JSP PROGRAMMING**

**19 Hrs**

JSP development, Basic JSP Lifecycle, JSP Elements, Directive Elements, Page Directive, Include directive, Scripting elements, Declaration, Scriptlets, Expressions, Action elements, Standard action, <jsp : param> ,<jsp : include> ,<jsp : forward> ,<jsp : plugin> ,Comments and template data ,Scope of JSP variables, Page, Request, Session, Application Using implicit ,objects ,The request object ,The response object ,The out object ,The session object ,The config object ,The exception object ,The application object ,Handling Errors and Exception -Dealing with exception in the page & directive, Dealing with exception in the Deployment Descriptor ,Adding exception handling in JSP, pages, Including and forwarding from -JSP ,pages ,Include Action ,Forward Action.

### **UNIT-IV SERVLET PROGRAMMING**

**19 Hrs**

Introduction to Servlets, Servlets Implementation, The servlet interface, The Generic Servlet class, The single thread Model interface, The Http Servlet class, Service(), doGet(), doPost(), doDelete() ,doOption(), doPut(), doTrace(), Servlet Exceptions, The Servlet Exception class- The unavailable Exception class ,Servlet Lifecycle ,Servlet Request and Response ,The Http Servlet Request interface, GetAttribute(), setAttribute(), getAttributeNames(), getparameters(), getParameternames(), getParameterValues(), getRemoteHost(), getRemoteAddr(), get\_cookies(), getHeaders(), getQueryString(), getSession(), The Http servlet Response Interface, getWriter(), getcontentType() ,addCookie(), encodeURL(), sendRedirect(), setHeader( ), setStatus(), Session Tracking Approaches, URL Rewriting, Hidden Form Fields Cookies, Session API, Session Tracking with Servlet API, The Http Session interface, GetAttribute(), GetAttributeNames() ,GetCreationTime(), GetId(), GetlastAccessedTime(), IsNew(), RemoveAttribute(), SetAttribute() ,SetMaxInactiveinterval(), Invalidate(), Servlet Collabration, Request Dispatching with Request, Dispatcher interface Forward(), Include(), Servlet Context, The servlet Context interface, getContext(), getRequestDispatcher(), getServerInfo(), getInitParameter(), getInitParameterNames(), getAttribute(), removeAttribute( ) .

### **UNIT-V INTRODUCTION TO STRUTS**

**16 Hrs**

A Web Application Framework - struts-config.xml; Understanding MVC architecture; ActionServlet, ActionForm, ActionMapping, Actionclasses.

JSP Expression Language: EL Introduction, EL Implicit Objects, EL Operators, EL Functions. JSP Standard Tag Library:JSTL Introduction, core tags, xml tags, sql tags, fmt tags, Core tags, <c : out>, <c : set> ,<c : if>, SQL tags, <sql : query>, <sql : update>, Fmt tags, <fmt : formatNumber>, <fmt : formatDate>.

#### **Practical For Classes :**

- 1.Individual project development was done.

**Distribution of Marks: Theory 70% and Problem 30%**

### TEXT BOOKS

| S. NO | AUTHORS              | TITLE               | PUBLISHERS        | YEAR OF PUBLICATION |
|-------|----------------------|---------------------|-------------------|---------------------|
| 1     | Horstman and Cornell | Core Java Volume-I  | Pearson Education | 2010                |
| 2     | Horstman and Cornell | Core Java Volume-II | Pearson Education | 2013                |
| 3     | Pekowsky             | Java Server Pages   | Pearson Education | 2013                |

### REFERENCE BOOKS

| S. NO | AUTHORS          | TITLE                       | PUBLISHERS          | YEAR OF PUBLICATION |
|-------|------------------|-----------------------------|---------------------|---------------------|
| 1     | Dustin R.Callway | Inside Servlets             | Pearson Education   | 2011                |
| 2     | James Goodwill   | Developing Java Servlets    | Techmedia Education | 2014                |
| 3     | Sebesta          | Programming world wide web. | Pearson Education   | 2015                |
| 4     | Murach           | Java JDK5                   | Murach Education    | 2011                |

### WEB RESOURCES

1. <https://www.class-central.com/course/nptel-computer-organization-and-architecture-a-pedagogical-aspect-9824>
2. <https://www.class-central.com/course/nptel-computer-organization-and-architecture-a-pedagogical-aspect-9824>
3. <https://www.mooc-list.com/tags/parallel-programming>

### TEACHING METHODOLOGY

- a. Class room teaching & Group discussions
- b. Seminars & Smart Class room
- c. Chart/Assignment & Simulation Model

### SYLLABUS DESIGNERS

1. Ms. A.SIVASANKARI, HOD, Dept of Computer Science
2. Mrs. R.LAKSHMI Assistant Prof, Dept of Computer Science
3. Mrs. B.ARULMOZHI, HOD, Dept of Computer Applications

## JSP AND SERVLET PROGRAMMING

| Semester | Subject Code | Category     | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|--------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |              | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| II       |              | CORE PRACT-3 | 3           | 45      | 3          | 45      | 0         | 0       | 3       |

### COURSE OBJECTIVE

➤ This practical helps us to develop the projects in Web Application using JSP and Servlets.

### SYLLABUS

- Create a web page with all types of Cascading style sheets.
- Client Side Scripts for Validating Web Form Controls using DHTML
- Write programs in Java to create applets incorporating the following Features:
  - Create a color palette with matrix of buttons
  - Set background and foreground of the control text area by Selecting a color from color palette.
  - In order to select Foreground or background use check box Control as radio buttons and to set background images.
- Write programs in Java using Servlets:
  - To invoke servlets from HTML forms
  - To invoke servlets from Applets
- Write programs in Java to create three-tier applications using JSP and Databases
  - For conducting on-line examination.
  - For displaying student mark list.

Assume that student information is available in database, it has been stored in database server.

6. Programs using AJAX.

7. Consider a case where we have two web Services- an airline service and a travel agent and the travel agent is searching for an airline. Implement this scenario using Web Services and data base

### SYLLABUS DESIGNERS

- Ms. A.SIVASANKARI, HOD, Dept of Computer Science
- Mrs. R.SHOBANA Assistant Prof, Dept of Computer Applications
- Mrs. B.ARULMOZHI, HOD, Dept of Computer Applications

## ADVANCED DATABASE MANAGEMENT SYSTEM

| Semester | Subject Code | Category       | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|----------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |                | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| II       |              | CORE PAPER - 5 | 6           | 90      | 6          | 90      | 0         | 0       | 4       |

### COURSE OBJECTIVE

➤ This paper help us to gain the knowledge for creating the large Data Base and plays a major role for maintaining the Data Base.

### COURSE OUTCOME

successful completion of the course, students will be able to

| CO Number  | CO Statement   | Knowledge Level (K1-K4) |
|------------|--|-------------------------|
| <b>CO1</b> | To learn the fundamentals of data models and to represent a database system using ER diagrams.                                   | K3                      |
| <b>CO2</b> | To study SQL and relational database design.   | K2                      |
| <b>CO3</b> | To understand the internal storage structures using different file and indexing techniques which will help in physical DB design | K3                      |
| <b>CO4</b> | To understand the fundamental concepts of transaction processing concurrency control techniques and recovery procedures.         | K4                      |
| <b>CO5</b> | To have an introductory knowledge about the Data warehouse storage.  | K4                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

### MAPPING WITH PROGRAMME OUTCOME

| COS        | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|------------|-----|-----|-----|-----|-----|-----|
| <b>CO1</b> | S   | M   | S   | M   | S   | S   |
| <b>CO2</b> | M   | S   | S   | S   | S   | M   |
| <b>CO3</b> | S   | S   | S   | M   | S   | S   |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO4</b> | S | M | S | M | S | M |
| <b>CO5</b> | S | M | S | M | S | M |

*S-Strong, M-Medium and L-Low*

## **SYLLABUS**

### **UNIT I – INTRODUCTION TO DBMS**

**17 Hrs**

Advantages and components of a database management systems - Feasibility Study - Class Diagrams - Data Types - Events - Normal Forms - Integrity - Converting Class Diagrams to Normalized tables - Data Dictionary.

### **UNIT II – BASICS OF SQL QUERIES**

**19 Hrs**

Query Basics - Computation using queries - Subtotals and GROUP BY commands - Queries with Multiple tables - Sub queries - Joins - DDL & DML - Testing Queries.

### **UNIT III – FORMS AND REPORTS**

**18 Hrs**

Effective Design of forms and reports - Form Layout - Creating Forms - Graphical Objects - Reports - Procedural Languages - Data on Forms - Programs to Retrieve and save Data - Error handling.

### **UNIT IV – APPLICATION AND ITS OPERATIONS**

**17 Hrs**

Power of application structure - User Interface Features - Transactions - Forms Events - Custom reports - Distributing Applications - Table Operations - Data Storage methods - Storing Data Columns - Data Clustering and partitioning.

### **UNIT V – DATABASE ADMINISTRATION**

**19 Hrs**

Database Administration - Development Stages - Application types - backup and recovery - Security and Privacy - Distributed databases - Client/Server Databases - Web as a Client/Server System - Object Oriented Databases - Integrated Applications.

### **Practical For Classes :**

1. Individual project development was done.

**Distribution of Marks: Theory 70% and Problem 30%**

### TEXT BOOKS

| S. NO | AUTHORS        | TITLE  | PUBLISHERS                         | YEAR OF PUBLICATION |
|-------|----------------|--|------------------------------------|---------------------|
| 1     | Gerald V. Post | Database management Systems-- Designing and building Business Applications | Mc Graw hill International Edition | 1999                |

### REFERENCE BOOKS

| S. NO | AUTHORS   | TITLE                       | PUBLISHERS         | YEAR OF PUBLICATION |
|-------|---|-----------------------------|--------------------|---------------------|
| 1     | Abraham Silberschatz<br>Henry F. Korth and S. Sudarshan | Database System Concepts    | McGraw-Hill        | 2006.               |
| 2     | Raghu Ramakrishnan                                      | Database management Systems | WCB / Mc Graw Hill | 1998                |

### WEB RESOURCES

1. <https://www.tutorialspoint.com/dbms/>
2. <https://www.w3schools.in/dbms/>

### TEACHING METHODOLOGY

- Class room teaching & Group discussions
- Seminars & Smart Class room
- Chart/Assignment & Simulation Model

### SYLLABUS DESIGNERS

1. Ms. A.SIVASANKARI, HOD, Dept of Computer Science
2. Mrs. S.ANGEL RABECCA Assistant Prof, Dept of Computer Science
3. Mrs. B.ARULMOZHI, HOD, Dept of Computer Applications

### ADVANCED DATABASE MANAGEMENT SYSTEM

| Semester | Subject Code | Category     | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|--------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |              | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| II       |              | CORE PRACT-4 | 3           | 45      | 3          | 45      | 0         | 0       | 3       |

### COURSE OBJECTIVE

- This practical helps us to develop the real time projects in VB with oracle.

### SYLLABUS

Students are advised to use the concepts like Data Normalization, Link between table by means of Foreign keys and other relevant database concepts for developing databases for following problems. The implementation of each problem should have necessary input screen Menu-driven query processing and pleasing reports. The choice of RDBMS is left to the students. Necessary validations must be done after developing database.

1. Library Information Processing
2. Telephone Directory maintenance
3. Gas Booking and delivering system
4. Electricity Bill Processing
5. Pay roll Processing
6. Personal Information System
7. Question Database and Conducting quiz

**Distribution of Marks: Program Output with Viva voce: 85% and Record:15%**

### SYLLABUS DESIGNERS:

1. Ms. A.SIVASANKARI, HOD, Dept of Computer Science
2. Ms.P.SIVAGAMI Asst. Prof, Dept of Computer Science
3. Mrs. B. ARULMOZHI, HOD, Dept of Computer Applications

## PRINCIPLES OF COMPILER DESIGN

| Semester | Subject Code | Category       | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|----------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |                | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| II       |              | CORE PAPER - 6 | 5           | 75      | 5          | 75      | 0         | 0       | 4       |

### COURSE OBJECTIVE

- This paper helps the students to know about how to compile and parsing the software programs.

### COURSE OUTCOME

successful completion of the course, students will be able to

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | Understand the phases and tools available in compiler   | K2                      |
| CO2       | Design and implement a lexical analyzer   | K3                      |
| CO3       | Compare and analyze different types of compilers  | K4                      |
| CO4       | Specify appropriate translations to generate Intermediate code for the given Programming language Construct | K3                      |
| CO5       | Identify sources for Code Optimization  | K4                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

### MAPPING WITH PROGRAMME OUTCOME

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | M   | S   | S   | M   |
| CO2 | S   | S   | S   | M   | M   | S   |
| CO3 | S   | S   | S   | S   | S   | M   |
| CO4 | S   | S   | S   | S   | M   | M   |
| CO5 | S   | S   | S   | M   | S   | S   |



*S-Strong, M-Medium and L-Low*

## **SYLLABUS**

### **UNIT I – INTRODUCTION TO COMPILERS**

**14 Hrs**

Introduction to compiling - Compilers - Analysis of the source program - Phases of a compiler. Grouping of Phases - Compiler construction tools.

### **UNIT II – LEXICAL ANALYSIS**

**15 Hrs**

Lexical Analysis - Role of the lexical Analyzer - specification and Recognition of tokens - Language for specifying lexical Analyzer - Finite Automata -regular expression to NFA - Design of lexical Analyzer generator - Optimization of DFA - based pattern matchers.

### **UNIT III – SYNTAX ANALYSIS**

**15 Hrs**

Syntax Analysis - Role of parser - context free grammars - Top down parsing - Bottom up parsing - Operator precedence parsing - LR Parsers.

### **UNIT IV – SYNTAX DIRECTED TRANSLATION**

**15 Hrs**

Syntax Directed Translation: Syntax directed Definitions - construction of syntax trees - Bottom up evaluation of attributed definition - Bottom up evaluation of inherited attributes - Recursive evaluators.

### **UNIT V -INTERMEDIATE CODE GENERATION AND OPTIMIZATION 16 Hrs**

Intermediate Code generation: Intermediate languages - Declaration - Assignment statements. Procedure calls - Runtime storage management. Code generation and optimization: Basic blocks and Flow graphs - DAG representation.

**Distribution of Marks: Theory 75% and Problem 25%**

## **TEXT BOOKS**

| <b>S. NO</b> | <b>AUTHORS</b>                          | <b>TITLE</b>                                  | <b>PUBLISHERS</b>          | <b>YEAR OF PUBLICATION</b> |
|--------------|---|---|----------------------------|----------------------------|
| 1            | Alfred Aho Ravi Sethi<br>Jeffy D.Ullman | Compilers-<br>Principles,Techniques and Tools | Pearson                    | 1986                       |
| 2            | Dick Grune, Bal,<br>Langendoen,Jacobs   | Modern<br>Compiler Design                     | Wiley                      | 2012                       |
| 3            | K.Muneeswaran                           | Compiler Design                               | Oxford University<br>Press | 2013                       |

## REFERENCE BOOKS

| S. NO | AUTHORS                 | TITLE                                       | PUBLISHERS                 | YEAR OF PUBLICATION |
|-------|-------------------------|---|----------------------------|---------------------|
| 1     | David Galles            | Modern Compiler design                      | Pearson education Asia     | 2001                |
| 2     | Steven S. Muchnick      | Advanced Compiler Design and implementation | Morgan Kaufmann Publishers | 2000                |
| 3     | C.N.Fisher R.J.Le Blanc | Crafting a compiler with c                  | Pearson Education          | 2000                |

## WEB RESOURCES

- 1.<https://www.geeksforgeeks.org/compiler-lexical-analysis>
- 2.<https://ieeexplore.ieee.org/document/7779385/>
- 3.[https://www.tutorialspoint.com/compiler\\_design/compiler\\_design\\_tutorial.pdf](https://www.tutorialspoint.com/compiler_design/compiler_design_tutorial.pdf)

## TEACHING METHODOLOGY

- Class room teaching & Group discussions
- Seminars & Smart Class room
- Chart/Assignment & Simulation Model

## SYSTEM DESIGNER

1. Ms.A.SIVASANKARI, HOD, Dept of Computer Science
2. Mrs. K.AYESHA Asst Prof, Dept of Computer Applications
3. Mrs. B.ARULMZOHI, HOD, Dept of Computer Applications

## COMPUTER NETWORKS

| Semester | Subject Code | Category     | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|--------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |              | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| II       |              | ELECTIVE -II | 5           | 75      | 5          | 75      | 0         | 0       | 4       |

## COURSE OBJECTIVE

- The course provides the overviews learning about computer network organization and implementation, obtaining a theoretical understanding of data communication.

## COURSE OUTCOME

successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | Learning the fundamental concepts of computer networking.                                      | K2                      |
| CO2       | To familiarize the student with the basic taxonomy and terminology of the transmission medium. | K3                      |
| CO3       | Analyse the technique of error detection and correction  | K2                      |
| CO4       | Understanding the importance of routing algorithms   | K3                      |
| CO5       | To learn about networking and internetworking devices  | K4                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

## MAPPING WITH PROGRAMME OUTCOME

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | M   | S   | S   |
| CO2 | S   | S   | M   | M   | S   | M   |
| CO3 | S   | M   | S   | M   | S   | S   |
| CO4 | S   | S   | M   | S   | M   | S   |
| CO5 | S   | S   | S   | M   | M   | S   |

*S-Strong, M-Medium and L-Low*

## SYLLABUS

### UNIT I - BASICS OF COMPUTER NETWORKS

**14 Hrs**

Introduction to computer networks - Uses of network-Network structure - The OSI reference model concepts-Layers of the OSI model.

**UNIT II – TRANSMISSION MEDIUM****16 Hrs**

The Physical layer-Different types of transmission medium-CODEC-Switching techniques-Channel allocation methods-ALOHA protocol-LAN protocol (any one protocol)-IEEE standards 802.3,802.4 and 802.5.

**UNIT III – DATA LINK LAYER****15 Hrs**

The data link layer - design issues-Concept of framing - Different methods - Error detection and correction: Single error correction and cyclic redundancy check.

**UNIT IV – NETWORK LAYER****14 Hrs**

The network layer-design issues-Internal organization of network layer - Congestion control algorithm, Leaky bucket algorithm and token bucket algorithm - Dijkstra routing algorithm.

**UNIT V – OSI LAYERS****16 Hrs**

Repeaters, Bridges, Routers and Gateways-Brief introduction to the transport layer, session layer, presentation layer and application layer-Basic concepts of Internet WWW.

**Distribution of Marks: Theory 75% and Problem 25%**

**TEXT BOOKS**

| S. NO | AUTHORS                           | TITLE                 | PUBLISHERS                           | YEAR OF PUBLICATION |
|-------|-----------------------------------|-----------------------|--------------------------------------|---------------------|
| 1     | James F. Kurose and Keith W. Ross | Computer Networking   | Pearson Education                    | 2006                |
| 2     | Andrew S. Tanenbaum               | Computer Networks     | 4th edition, Prentice-Hall of India. | 2003                |
| 3     | Charles P.fleeger, S.L.Pfleeger   | Security in Computing | Pearson Education, Fourth Edition,   | 2013                |

**REFERENCE BOOKS**

| S. NO | AUTHORS        | TITLE              | PUBLISHERS       | YEAR OF PUBLICATION |
|-------|----------------|--------------------|------------------|---------------------|
| 1     | Achyut Godbole | Data Communication | Tata McGraw Hill | 2007                |

|   |              |  |                           |       |
|---|--------------|--|---------------------------|-------|
|   |              | and Networks   | Publicatons               |       |
| 2 | Uyless Black | Computer Networks<br>Protocols, Standards,<br>and Interfaces | PHI,<br>Second Edition    | 2010. |
| 3 | Sarma.C.R    | Computer Networks<br>Pragmatic Approach                      | Jaico Publishing<br>Home, | 2005. |

### WEB RESOURCES

1. <https://www.studytonight.com/computer-networks/>
2. [https://www.tutorialspoint.com/data\\_communication\\_computer\\_network/](https://www.tutorialspoint.com/data_communication_computer_network/)

### TEACHING METHODOLOGY

- Class room teaching & Group discussions
- Seminars & Smart Class room
- Chart/Assignment & Simulation Model

### SYSTEM DESIGNER

1. Ms.A.SIVASANKARI, HOD, Dept of Computer Science
2. Ms.P.RAMYA Asst Prof, Dept of Computer Science
3. Mrs. B.ARULMZOH, HOD, Dept of Computer Applications

### OBJECT ORIENTED ANALYSIS AND DESIGN

| Semester | Subject Code | Category     | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|--------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |              | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| II       |              | ELECTIVE -II | 5           | 75      | 5          | 75      | 0         | 0       | 4       |

### COURSE OBJECTIVE

- The course provides Understand the importance and basic concepts of object oriented modelling, Specify, analyze and design the use case driven requirements for a particular system.

## COURSE OUTCOME

successful completion of the course, students will be able to

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| C01       | Analyse, design, document the requirements through use case driven approach.    | K2                      |
| C02       | Identify, analyse, and model structural and behavioral concepts of the system   | K3                      |
| C03       | Design the process into various scenarios and applications                      | K3                      |
| C04       | Apply the concepts of architectural design for deploying the code for software. | K4                      |
| C05       | Continuous testing of process and debugging principles                          | K4                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*

## MAPPING WITH PROGRAMME OUTCOME

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| C01 | S   | S   | S   | M   | S   | M   |
| C02 | S   | S   | M   | S   | S   | M   |
| C03 | S   | S   | S   | M   | S   | S   |
| C04 | S   | S   | S   | S   | M   | S   |
| C05 | S   | S   | S   | S   | M   | S   |

*S- Strong; M- Medium; L- Low*

## SYLLABUS

### UNIT I – OVERVIEW OF OOS DEVELOPMENT

**15 Hrs**

Object Orientation – System development – Review of objects – inheritance – Object relationship – Dynamic binding – OOSD life cycle – Process – Analysis – Design – prototyping – Implementation – Testing- Overview of Methodologies.

### UNIT II – OBJECT ORIENTED METHODOLOGIES

**14 Hrs**

OMT – Booch methodology, Jacobson methodology – Patterns – Unified approach –

UML – Class diagram – Dynamic modeling.

### **UNIT III – USECASE MODELS**

**15 Hrs**

Use case model – Creation of classes – Noun phrase approach – responsibilities – Collaborators – Object relationships – Super-Sub class – Aggregation.

### **UNIT IV – OBJECT ORIENTED DESIGN**

**16 Hrs**

Object oriented Design axioms – Class visibility – Refining attributes – Methods – Access layer – Object oriented DBMS – Table – class mapping view layer

### **UNIT V – SOFTWARE QUALITY ASSURANCE**

**15 Hrs**

Quality assurance testing – Inheritance and testing – Test plan – Usability testing User satisfaction – Testing.

**Distribution of Marks: Theory 95% and Problem 5%**

### **TEXT BOOKS**

| <b>S. NO</b> | <b>AUTHORS</b> | <b>TITLE</b>                        | <b>PUBLISHERS</b>                 | <b>YEAR OF PUBLICATION</b> |
|--------------|----------------|-------------------------------------|-----------------------------------|----------------------------|
| 1            | Ali Bahrami    | Object Oriented Systems Development | McGraw Hill International Edition | 1999                       |

### **REFERENCE BOOK**

| <b>S. NO</b> | <b>AUTHORS</b>                  | <b>TITLE</b>  | <b>PUBLISHERS</b>                        | <b>YEAR OF PUBLICATION</b> |
|--------------|---------------------------------|---|--|----------------------------|
| 1            | Grady Booch                     | Object Oriented Analysis and Design                       | Person Education-2 <sup>nd</sup> Edition | 2011                       |
| 2            | Carol Britton and Jill Doake    | Object Oriented System Development: A Gentle Introduction | Paperback                                | 2012                       |
| 3            | David West and Brett McLaughlin | Head First Object Oriented Analysis and Design            | Kindle Edition                           | 2011                       |

### **WEB RESOURCES**

1. [https://www.tutorialspoint.com/object\\_oriented\\_analysis\\_design/](https://www.tutorialspoint.com/object_oriented_analysis_design/)
2. <https://www.startertutorials.com/uml/category/ooad>

### **TEACHING METHODOLOGY**

- Class room teaching & Group discussions
- Seminars & Smart Class room
- Chart/Assignment & Simulation Model

## SYSTEM DESIGNER

1. Ms.A.SIVASANKARI, HOD, Dept of Computer Science
2. Mrs. R.SHOBANA Asst Prof, Dept of Computer Applications
3. Mrs. B.ARULMZOHI, HOD, Dept of Computer Applications

## MULTIMEDIA

| Semester | Subject Code | Category     | Lecture Hrs |         | Theory Hrs |         | Practical |         | Credits |
|----------|--------------|--------------|-------------|---------|------------|---------|-----------|---------|---------|
|          |              |              | Per week    | Per Sem | Per week   | Per Sem | Per week  | Per Sem |         |
| II       |              | ELECTIVE -II | 5           | 75      | 5          | 75      | 0         | 0       | 4       |

### COURSE OBJECTIVE

- The course provides to develop the Graphics skill and to develop the Creativity thoughts for doing animation.

### COURSE OUTCOME

successful completion of the course, students will be able to

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| C01       | To Develop an Understanding and Awareness of Motion,sound,design and Technology   | K1                      |
| C02       | To study the Basic tools of Multimedia, Various Software programs used in the creation and implementation of multi media. | K2                      |
| C03       | To Study the Text and sound   | K3                      |
| C04       | To understand the Graphics and transformation   | K3                      |
| C05       | To have an introductory knowledge about Planning and costing  | K4                      |

*Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze*



### MAPPING WITH PROGRAMME OUTCOME

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | M   | M   | S   |
| CO2 | M   | S   | M   | M   | S   | S   |
| CO3 | S   | S   | M   | M   | S   | S   |
| CO4 | S   | M   | S   | S   | M   | M   |
| CO5 | S   | M   | S   | S   | M   | S   |

*S-Strong, M-Medium and L-Low*

### SYLLABUS

#### UNIT I - INTRODUCTION TO MULTIMEDIA

**14 Hrs**

Definition – Classification – Multimedia application – Multimedia H/W – Multimedia S/W – CDROM – DVD.

#### UNIT II - MULTIMEDIA AUDIO

**15 Hrs**

Digital medium – Digital audio technology – Soundcards – recording – editing – MP3 – MIDI Fundamentals – Working with MIDI – audio file formats – adding sound to MM Project.

#### UNIT III - MULTIMEDIA TEXT

**16 Hrs**

Text in Multimedia – Multimedia graphics: Coloring – digital imaging fundamentals – development and editing – file formats – Scanning and Digital Photography.

#### UNIT IV - MULTIMEDIA ANIMATION AND VIDEO

**16 Hrs**

Computer animation fundamentals – Kinematics – Morphing – animation s/w tools and techniques.

How Video works – Board cast video standards – Digital video fundamentals – Digital video Production and Editing techniques – file formats.

#### UNIT V - MULTIMEDIA PROJECT

**14 Hrs**

Stages of Project – Multimedia skills –Design concept – authoring – Planning and Costing – Multimedia team.

**Distribution of Marks: Theory 85% and Application Oriented 15%**

### TEXT BOOKS

| S. NO | AUTHORS                 | TITLE                      | PUBLISHERS           | YEAR OF PUBLICATION |
|-------|-------------------------|----------------------------|----------------------|---------------------|
| 1     | Tay Vaughan             | Multimedia: Making it work | Fourth Edition       | 1999                |
| 2     | John F Koegel<br>Buford | Multimedia System          | First Indian Reprint | 2000                |

### REFERENCE BOOKS

| S. NO | AUTHORS                  | TITLE                                    | PUBLISHERS                    | YEAR OF PUBLICATION |
|-------|--------------------------|--|-------------------------------|---------------------|
| 1     | Brusilovsky, Peter       | The Adaptive Web                         | Berlin Springer               | 2007                |
| 2     | Christopher<br>D.Manning | Introduction to<br>information Retrieval | Cambridge University<br>Press | 2008                |

### WEB RESOURCES

1. <https://www.enggedu.com>
2. <https://multimedia.journalism.berkeley.edu/tutorials/>

### TEACHING METHODOLOGY

- Class room teaching & Group discussions
- Seminars & Smart Class room
- Chart/Assignment & Simulation Model

### SYSTEM DESIGNER

1. Ms.A.SIVASANKARI, HOD, Dept of Computer Science
2. Mrs S.ANGEL RABECCA Asst Prof, Dept of Computer Science
3. Mrs. B.ARULMZOH, HOD, Dept of Computer Applications

## BBA (BACHELOR OF BUSINESS ADMINISTRATION)

### PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

**PEO1:** To provide the fundamental concepts and theory of business practice and understanding of the global context in which business operates.

**PEO2:**To develop the ability to think critically, Analyze problems quantitatively and to use a variety of appropriate in solving business problems.

**PROGRAMME OUTCOMES (PO):**

**PO1:**Students will be able to demonstrate foundational knowledge of the functional areas of business.

**PO2:** To provide students with a broad range of managerial capabilities, the capacity for critical thinking, communication and problem-solving skills, legal and ethical behavior.

**PO3:**Students will be able to demonstrate knowledge of the ethical obligations of business and apply them to business decisions.

**PO4:**Students identify business opportunities and formulate plans, and detect business problems and develop alternative solutions.

**PO5:**To prepare graduates for diverse careers in global management, administration and entrepreneurship through a well-rounded business education with a focus on global business operations, emerging markets and technology-enabled organizations.

**PO6:**To develop appropriate skills in the students so as to make them competent and provide themselves self – employment.

**DEPARTMENT OF MANAGEMENT STUDIES**

**BBA**

**SEMESTER- I**

| S.NO | Part | Course title   | Subject code | Ins /H rs | Cr edit | Title of the paper            | Maximum marks |           |       |
|------|------|----------------|--------------|-----------|---------|-------------------------------|---------------|-----------|-------|
|      |      |                |              |           |         |                               | CIA           | Uni. Exam | Total |
| 1    | I    | Language – I   |              | 6         | 4       | Tamil – I / Other language    | 25            | 75        | 100   |
| 2    | II   | English – I    |              | 6         | 4       | English – I                   | 25            | 75        | 100   |
| 3    | III  | Core paper – I |              | 5         | 4       | Basics of Managerial Concepts | 25            | 75        | 100   |

|   |     |                  |  |    |    |   |     |     |     |
|---|-----|------------------|--|----|----|---|-----|-----|-----|
| 4 | III | Core paper - II  |  | 5  | 4  | Business Organization                   | 25  | 75  | 100 |
| 5 | III | Allied paper – I |  | 6  | 5  | Business mathematics and Statistics – I | 25  | 75  | 100 |
| 6 | IV  | EVS              |  | 2  | 2  | EVS                                     | 25  | 75  | 100 |
|   |     | TOTAL            |  | 30 | 23 |   | 150 | 450 | 600 |

#### SEMESTER II

|    |     |                   |  |    |    |  |     |     |     |
|----|-----|-------------------|--|----|----|--|-----|-----|-----|
| 7  | I   | Language – II     |  | 6  | 4  | Tamil – II / Other language              | 25  | 75  | 100 |
| 8  | II  | English – II      |  | 4  | 4  | English – II                             | 25  | 75  | 100 |
| 9  | III | Core paper – III  |  | 5  | 4  | Business Communication                   | 25  | 75  | 100 |
| 10 | III | Core paper – IV   |  | 5  | 4  | Production management                    | 25  | 75  | 100 |
| 11 | III | Allied paper – II |  | 6  | 5  | Business mathematics and Statistics – II | 25  | 75  | 100 |
| 12 | IV  | Value education   |  | 2  | 2  | Value education                          | -   | 50  | 50  |
| 13 | IV  | Soft skills       |  | 2  | 1  | Soft skills                              | -   | 50  | 50  |
|    |     | TOTAL             |  | 30 | 24 |  | 125 | 475 | 600 |

#### SEMESTER III

| S.N O | Part | Course title     | Subject code | Ins /Hrs | Credit | Title of the paper                       | CIA | Uni. exam | Total |
|-------|------|------------------|--------------|----------|--------|--|-----|-----------|-------|
| 14    | I    | Core paper – V   |              | 6        | 4      | Human Resource Management                | 25  | 75        | 100   |
| 15    | II   | Core paper – VI  |              | 6        | 4      | Business Policy and Strategic Management | 25  | 75        | 100   |
| 16    | III  | Core paper – VII |              | 5        | 4      | Financial Accounting                     | 25  | 75        | 100   |

|    |     |                         |  |    |    |                          |     |     |     |
|----|-----|-------------------------|--|----|----|--------------------------|-----|-----|-----|
| 17 | III | Elective paper –I       |  | 3  | 3  | Principles of Banking    | 25  | 75  | 100 |
| 18 | III | Allied paper – III      |  | 6  | 5  | Managerial Economics     | 25  | 75  | 100 |
| 19 | IV  | Skill based subject – I |  | 2  | 2  | Training and Development | -   | 50  | 50  |
| 20 | IV  | Non – major – I         |  | 2  | 2  | Management Concept       | -   | 50  | 50  |
|    |     | Total                   |  | 30 | 24 |                          | 125 | 475 | 600 |

#### SEMESTER IV

|    |     |                          |  |    |    |                                  |     |     |     |
|----|-----|--------------------------|--|----|----|----------------------------------|-----|-----|-----|
| 21 | I   | Core paper – VIII        |  | 6  | 4  | Legal Aspects of Business        | 25  | 75  | 100 |
| 22 | II  | Core paper – IX          |  | 5  | 4  | Cost Accounting                  | 25  | 75  | 100 |
| 23 | III | Core paper – X           |  | 6  | 4  | Organizational behavior          | 25  | 75  | 100 |
| 24 | III | Elective paper –II       |  | 3  | 3  | Management Information System    | 25  | 75  | 100 |
| 25 | III | Allied paper – IV        |  | 6  | 5  | Operations Research              | 25  | 75  | 100 |
| 26 | IV  | Skill based subject – II |  | 2  | 2  | E – Business                     | -   | 50  | 50  |
| 27 | IV  | Non – major – II         |  | 2  | 2  | Women Entrepreneurial management | -   | 50  | 50  |
|    |     | Internship Training      |  |    | 2  |                                  |     |     |     |
|    |     | TOTAL                    |  | 30 | 24 |                                  | 125 | 475 | 600 |

#### SEMESTER- V

| S. NO | Part | Course title    | Subject code | In s/ Hrs | Credit | Title of the paper   | CIA | Uni. exam | Total |
|-------|------|-----------------|--------------|-----------|--------|----------------------|-----|-----------|-------|
| 28    | II   | Core paper – XI |              | 6         | 4      | Research Methodology | 25  | 75        | 100   |

|    |     |                           |  |    |    |  |     |     |     |
|----|-----|---------------------------|--|----|----|--|-----|-----|-----|
| 29 | III | Core paper – XII          |  | 6  | 4  | Marketing Management                                 | 25  | 75  | 100 |
| 30 | III | Core paper – XIII         |  | 6  | 4  | Industrial Relations and Labour Welfare              | 25  | 75  | 100 |
| 31 | III | Core paper – XIV          |  | 6  | 4  | Total Quality Management                             | 25  | 75  | 100 |
| 32 | III | Elective – III            |  | 4  | 3  | Business Environment                                 | 25  | 75  | 100 |
| 33 | IV  | Skill based subject – III |  | 2  | 2  | Personality Development and soft skills for Business | -   | 50  | 50  |
|    |     | TOTAL                     |  | 30 | 21 |  | 125 | 425 | 550 |

#### SEMESTER –VI

| S. NO | Part | Course title             | Subject code | In s/ Hr s | Credit | Title of the paper                 | CIA | UNI. EXAM | TOTAL |
|-------|------|--------------------------|--------------|------------|--------|------------------------------------|-----|-----------|-------|
| 33    | III  | Core paper – XV          |              | 6          | 4      | Entrepreneurial Development        | 25  | 75        | 100   |
| 34    | III  | Core paper – XVI         |              | 6          | 4      | Management Accounting              | 25  | 75        | 100   |
| 35    | III  | Core paper – XVII        |              | 6          | 4      | Material Management                | 25  | 75        | 100   |
| 36    | III  | Core paper – XVIII       |              | 6          | 4      | Project                            | 25  | 75        | 100   |
| 37    | III  | Elective – IV            |              | 4          | 3      | Business Ethics                    | 25  | 75        | 100   |
| 38    | IV   | Skill based subject – IV |              | 2          | 2      | Practical : Tally and GST Oriented | -   | 50        | 50    |
| 39    | V    | Extension Activities     |              | -          | 3      | Extension Activities               | 100 | -         | 100   |

|  |  |       |  |    |     |  |     |     |      |
|--|--|-------|--|----|-----|--|-----|-----|------|
|  |  | TOTAL |  | 30 | 24  |  | 225 | 425 | 650  |
|  |  |       |  |    | 140 |  |     |     | 3600 |

### **CONSOLIDATED STATEMENT**

| <b>PART</b> | <b>SUBJECT</b>       | <b>PAPERS</b> | <b>CREDIT</b> | <b>TOTAL CREDITS</b> | <b>MARKS</b> | <b>TOTAL MARKS</b> |
|-------------|----------------------|---------------|---------------|----------------------|--------------|--------------------|
| Part I      | Languages            | 2             | 4             | 8                    | 100          | 200                |
| Part II     | English              | 2             | 4             | 8                    | 100          | 200                |
| Part III    | Allied               | 4             | 5             | 20                   | 100          | 400                |
| Part III    | Elective             | 4             | 3             | 12                   | 100          | 400                |
| Part III    | Core Theory          | 18            | 4             | 72                   | 100          | 1800               |
| Part III    | Core Practical       | -             | -             | -                    | -            | -                  |
| Part IV     | EVS                  | 1             | 2             | 2                    | 100          | 100                |
| Part IV     | Value Education      | 1             | 2             | 2                    | 50           | 50                 |
| Part IV     | Skill Based Subject  | 4             | 2             | 8                    | 50           | 200                |
| Part IV     | Non – Major          | 2             | 2             | 4                    | 50           | 100                |
| Part IV     | Soft Skill           | 1             | 1             | 1                    | 50           | 50                 |
| Part V      | Extension Activities | -             | 3             | 3                    | 100          | 100                |
|             | Total                |               |               | 140                  |              | 3600               |

## BASICS OF MANAGERIAL CONCEPTS

| Sem | Subject code | Category       | Lecture   |              | Theory    |              | Credit |
|-----|--------------|----------------|-----------|--------------|-----------|--------------|--------|
|     |              |                | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | Core paper - I | 75        | 5            | 75        | 5            | 4      |

### COURSE OBJECTIVE:

Knowledge on the basics of managerial economics is essential for all kinds of organizations. This subject will enhance the students to learn about basic functions of management like planning, organizing, Delegation, Conflict and Coordination.

### COURSE OUTCOMES:

**On Successful completion of the Course the student will be able:**

| CO Number | CO Statement   | Knowledge level(K1-K4) |
|-----------|--|------------------------|
| CO1       | To acquaint the students with the fundamentals of management functions.                                | K1                     |
| CO2       | To make clear and understand about planning and organization policies.                                 | K2                     |
| CO3       | Interpret why a good organizational structure and coordination is needed for effective organizations . | K2                     |
| CO4       | To Managing power and authority, responsibilities understand in several organizations.                 | K3                     |
| CO5       | Causes of conflicts and need for co-ordination clearly understand in an organization.                  | K3                     |

**K1 – Remember; K2 – Understand; K3 – Apply; K4– Analyze**

### MAPPING WITH PROGRAMME OUTCOMES:

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | M   | M   | S   |
| CO2 | M   | S   | M   | M   | M   | M   |
| CO3 | M   | M   | M   | M   | S   | M   |
| CO4 | M   | M   | M   | M   | M   | M   |
| CO5 | M   | M   | M   | M   | M   | M   |

**S – Strong; M – Medium; L – Low**



**UNIT- I Management****15 Hours**

**Concept of Management** – Scope –Importance - Nature - Functions - Evolution of Management Thought - Levels of management - Functional areas of management- Management skills – Management – An art or Science – Management and Administration – Roles of manager.

**UNIT -II Planning****15 Hours**

**Concept of Planning:** Nature- Importance- Steps-Types of Planning- Types of Plan- Barriers to Effective planning-Making planning effective -Concept of Forecasting - Techniques of Forecasting - Management By Objectives –**Concept of Decision Making** - Types of Decision Making -Decision Making process-Techniques of Decision making process.

**UNIT- III Organizing****15 Hours**

**Concept of Organization and Organizing:** Nature –Process- Principles of Organization -

Factors Affecting Organization structure-Organization Structure. **Concept of Departmentation:** Bases-Principles-Need-Types-Span of management-**Delegation of Authority:** Blocks to effective Delegation –Measures for Effective Delegation – Centralization and Decentralization. Power-Bases of power-**Concept of Authority:** Sources-Limits- Responsibility –Authority Relationships-Concept of line and staff Authority-Organization Manual.

**UNIT- IV Staffing and Directing****15 Hours**

**Recruitment:** Process-Recruitment policy-Recruitment organization-planning-Factors affecting Recruitment Policy and programme-Sources-Techniques-**Selection:** Concept- Nature-process-Selection Testing-Selection Interviewing-Barriers of selection-**Training and Development:** Objectives-Need-Importance-Distinguish between Training and Development-Process-Types-**Concept of Motivation:** Importance of Motivation-Types of Motivation-Theories of Motivation: Maslow's Need Hierarchy Theory-McClelland's Need Theory-McGregor's Theory X and Y Theory.

**UNIT -V Control and Coordination****15 Hours**

**Fundamentals of Controlling: Concept** - Process - Need For Control - Types of Control :Budgetary Control And Non –Budgetary Control-Steps in Controlling-Source of Controlling-Techniques –Limitation-**Coordination:** Need-Importance –Steps-Types and principles of Coordination-Techniques of Effective Coordination-Difference Between Coordination and Cooperation.

**TEXT BOOKS:**

| <b>Sl. no</b> | <b>Authors</b>                          | <b>Title</b>                          | <b>Publishers</b>                           | <b>Year of publication</b> |
|---------------|---|---------------------------------------|---|----------------------------|
| <b>1</b>      | L.M. Prasad                             | Principles and Practice of Management | Sultan Chand & Sons 8 <sup>th</sup> Edition | 2013                       |
| <b>2</b>      | J. Jayasankar                           | Principles of Management              | Margham publication                         | 2009                       |
| <b>3</b>      | R. Sivarethinamohan and P. Aranganathan | Principles of Management              | CBA Publication                             | 2011                       |
| <b>4</b>      | R.N.Gupta                               | Principles of Management              | Sultan Chand & sons                         | 2001                       |
| <b>5</b>      | Taloo                                   | Business organization and Management  | Tata McGraw Hill                            | 2007                       |

**REFERENCE BOOKS:**

| <b>S.N O</b> | <b>Authors</b>                      | <b>Title</b>                             | <b>Publishers</b>                               | <b>Year of publication</b> |
|--------------|-------------------------------------|--|---|----------------------------|
| <b>1</b>     | Hellriegel, Slocum & Jackson        | Management - A Competency Based Approach | Thomson South Western, 10 <sup>th</sup> edition | 2007                       |
| <b>2</b>     | Charles W L Hill, Steven L McShane, | Principles of Management                 | Mcgraw Hill                                     | 2007                       |
| <b>3</b>     | P.C.Tripathi& P.N.Reddy             | Principles of Management                 | Tata Mcgraw Hill                                | 1991                       |

**TEACHING METHODOLOGY:**

- 1.Chalk& Talk
2. Lecture
3. Seminar
4. Assignment
5. Chart preparation

6. PPT
7. Group Discussion
8. You tube class
9. Case study
10. Role play

**SYLLABUS DESIGNER:**

**Dr. E. Rebeka**, Assistant Professor, Department of Management Studies, D.K.M College for Women.

**BUSINESS ORGANIZATION**

| Sem | Subject code | Category         | Lecture   |              | Theory    |              | Credit |
|-----|--------------|------------------|-----------|--------------|-----------|--------------|--------|
|     |              |                  | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| II  |              | Core paper – III | 75        | 5            | 75        | 5            | 4      |

**COURSE OBJECTIVE:**

Knowledge on business essential for all kinds of organizations. This subject will improve the students to learn about the relevant as long as business exists. It increasing complexity of the business world has generated and transformed interest in the fine distinction of the subject.

**COURSE OUTCOMES:**

**On Successful completion of the Course the student will be able:**

| CO Number | CO Statement  | Knowledge level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | To understand the basic business concepts.  | K2                      |
| CO2       | To provide various characteristic of business state through Trade and E-commerce and organizational Objectives and its evolution of business. | K2                      |
| CO3       | To understand the success of the organization with its Social and Business Ethics   | K3                      |
| CO4       | To understand the nature of Sole Proprietorship and partnership etc.,   | K3                      |

|     |   |    |
|-----|---|----|
| CO5 | To measure the performance of all organization and its practical approach and orientation of shares and Debentures, etc., | K3 |
|-----|---|----|

**K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze**

#### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

**S – Strong; M – Medium; L – Low**

#### **UNIT- I Nature and Evolution of Business**

**15 Hours**

Introduction-Human Activities –Nature –Characteristics of Business-Objectives of Business-Criteria for Success in Modern Business-Qualities of Successful Businessmen-Profession-Employment- Distinction between Business, Profession and Employment-Classification of Business Activities-Industry-Commerce-E-Commerce-Trade-and Auxiliaries to Trade-Difference between Trade and Commerce.**Evolution of Business:** Definition of Business-Stages in Evolution of Business-Evolution of Industry.

#### **UNIT- II Ethics and Social Responsibility of Business**

**15 Hours**

**Meaning of Ethics**-Definition-Characteristic-Meaning of Business Ethics-Definition of Business Ethics- Influencing Factors –Importance-Code of Ethics, Practices and Conduct-Unethical Practices in business-Ethical Practices in Business.**Social Responsibility of Business:** Definition –Meaning- Need-Arguments against-Social Responsibility towards various stakeholders-Research Evidence.

#### **UNIT –III Forms of Business Organization**

**15 Hours** Forms

ofBusinessOrganization –Selection of form Organization –Sole Trader-Partnership-Ideal Partnership- Distinction between Sole Trader and Partnership-Joint Stock Company-Features of Joint Stock Company -Distinction between Partnership and Joint Stock Company- Kinds of Companies-Private Limited Company-Formation of Company-Memorandum of Association-Articles of Association –Prospectus.

**UNIT – IV Capital and Directors****15 Hours**

Types of Shares –Kind of Shares Capital- Issue and Allotment of Shares- Equity Shares-Preferences Shares –Debentures-Difference between Equity Shares and Preference Shares-.Equity Shares Vs Debentures-Distinction between Share and Debentures-**Duties, Rights and Liabilities:**Introduction-Appointment of Directors-Power of Directors-Rights and Liabilities of Directors-Disabilities and Duties of Directors-Legal Position of Directors.

**UNIT- V Co-operative Enterprises****15 Hours**

Meaning - Origin - Definition-Features-Advantages-Disadvantages-Types-**Public Utilities:** Introduction-Definition-Characteristics-Rights and Duties-Problem faced by Public utilities-Forms of ownership and management-**Public Enterprises:** Introduction- Definition-Genesis-Objectives-Achievements- Problems Faced-Solutions-Types of public Enterprises-Departmental Undertaking-Government Companies – Public Corporations-Features-Advantages and Disadvantages- Distinction between Departmental Undertaking Vs Statutory Corporation- Department undertaking Vs Government Company.

**Text Books:**

| S.NO | Authors                    | Title                                    | Publishers                       | Year of publication |
|------|----------------------------|--|----------------------------------|---------------------|
| 1    | C.D.Balaji&Dr.G. Prasad    | Business Organisation                    | Margham publication              | 2012                |
| 2    | PragyaPrashant Gupta       | Business Organisation                    | Lokayatanpublication             | 2018                |
| 3    | C.D.Balaji                 | Business Organisationand Management      | Margham publication              | 2007                |
| 4    | R.K. Singla                | Business Organisationand Management      | VK Global Publications Pvt.Ltd., | 2018                |
| 5    | Taloo                      | Business organization and Management     | Tata McGraw Hill                 | 2007                |
| 6    | V.S.P. Rao                 | Business organization and Management     | Vikas Publishing                 | 2016                |
| 7    | P.C.Tulsian& Vishal Pandey | Business and Organisation and Management | Pearson                          | 2002                |

**Reference Books:**

| S.NO | Authors     | Title                   | Publishers          | Year of publication |
|------|-------------|-------------------------|---------------------|---------------------|
| 1    | Dr.A.Murthy | Industrial organisation | Margham Publication | 2015                |

|          |   |   |                                 |      |
|----------|---|---|---------------------------------|------|
| <b>2</b> | M.Muniraju,<br>N.Dinesh&Mur<br>ugesha B.N | Business organisation<br>and Environment    | Himalaya<br>Publishing<br>House | 2015 |
| <b>3</b> | NidhiChandork<br>ar&TusharAgra<br>wal     | Business Ethics and<br>Corporate Governance | Himalaya<br>Publishing<br>House | 2018 |
| <b>4</b> | H.R.<br>Appannaiah&<br>Dr.Dinakar         | Business organisation<br>and Environment    | Himalaya<br>Publishing<br>House | 2018 |

### **TEACHING METHODOLOGY :**

1. Chalk & Talk
2. Lecture
3. Seminar
4. Assignment
5. Chart preparation
6. PPT
7. Group Discussion
8. You tube class
9. Case study
10. Role play

### **SYLLABUS DESIGNER:**

**Dr. E. Rebeka**, Assistant Professor, Department of Management Studies, D.K.M College for Women

## ENVIRONMENTAL STUDIES

| Sem | Subject code | Category | Lecture   |              | Theory    |              | Credit |
|-----|--------------|----------|-----------|--------------|-----------|--------------|--------|
|     |              |          | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | EVS      | 30        | 2            | 30        | 2            | 2      |

### Course Objective:

The Objective of this paper is to acquaint the students to know the importance of the environment and to stimulate each individual to prevent the Natural resources.

### UNIT - I The Multidisciplinary nature of environmental studies 2 Hours

Definition, Scope and importance – Need for public awareness.

### UNIT - II Natural resources: Renewable and Non-renewable resources 7 Hours

Natural resources and associated problems.

- Forest resources: Use 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 extraction 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 nonrenewable energy sources, use of alternate energy sources. Case studies.
  - 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 - III Ecosystems 7 Hours

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chain, 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 ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

#### **UNIT - IV Biodiversity and its conservation 7 Hours**

- Introduction – Definition: Genetics, species and ecosystem diversity.
- Biogeographical classification of India.
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as a mega – diversity
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, manwildlife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

#### **UNIT - V Environmental pollution 7 Hours**

##### Definition

- a) Causes, effects and control measures of
  - b) Air pollution
  - c) Water pollution
  - d) Soil pollution
  - e) Marine pollution
  - f) Noise pollution
  - g) Thermal pollution
  - h) Nuclear hazards
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
  - Role of an individual in prevention of pollution.
  - Pollution case studies.
  - Disaster management: floods, earthquake, cyclone and landslides.

NB: Field visit is mandatory for Internal.



## BUSINESS COMMUNICATION

| Sem | Subject code | Category        | Lecture   |              | Theory    |              | Credit |
|-----|--------------|-----------------|-----------|--------------|-----------|--------------|--------|
|     |              |                 | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | Core paper - II | 75        | 5            | 75        | 5            | 4      |

### COURSE OBJECTIVE:

To develop business communication skills among the students. It enables learner to have an insight about various communication tools and barriers to communication.

### COURSE OUTCOMES:

**On Successful completion Of the Course the student will be able:**

| CO Number | CO STATEMENT   | Knowledge level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | To understand the concept, process and importance of communication.                | K1                      |
| CO2       | To develop skills of effective communication: Both written and Oral.               | K1                      |
| CO3       | To know and understand various business correspondence.                            | K2                      |
| CO4       | To understand about the Report writings.   | K2                      |
| CO5       | To know the various forms of modern communication and its application in business. | K2                      |

**K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze**

### MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | M   | S   | S   | S   | S   | S   |

|            |   |   |   |   |   |   |
|------------|---|---|---|---|---|---|
| <b>CO2</b> | M | S | S | S | M | S |
| <b>CO3</b> | S | S | M | S | S | S |
| <b>CO4</b> | S | S | M | M | S | M |
| <b>CO5</b> | S | S | S | S | S | S |

**S – Strong; M – Medium; L – Low**

### **UNIT- I Introduction to Business communication**

**15 Hours**

Definition – Essential and importance - communication process - Methods of communication- objectives - Types of communication - Principles of effective communication - Barriers to communication- Overcoming communication barriers.

### **UNIT –II Business Correspondence 15 Hours**

Business letter-Needs - Kinds of a business letter - Layout of a letter-Application for employment and resume- Enquires & replies -Offer and quotation -Execution of orders – Cancellation of orders – Letter of complaints – Collection letters.

### **UNIT- III Bank Correspondence**

**15 Hours**

Bank correspondence-Import and export correspondence- Insurance correspondence - Letter to the agency - Status enquiry – Tenders - Company correspondence - Duties of Secretary - Correspondence with directors and shareholders.

### **UNIT- IV Report Writing**

**15 Hours**

Report – Meaning –Importance -Characteristics of a good report - Principles of writing reports - Types of reports-structure of reports – Meetings – objectives – Classification – Agenda – Minutes – Memos - office orders – Circulars - Notices.

### **UNIT- V Modern Forms of Communication**

**15 Hours**

Internet - E-mail – Telephone- Fax - Video conferencing – Cell phone - Smartphone – Intercom -websites and their use in business

**TEXT BOOKS:**

| <b>S.NO</b> | <b>Authors</b>                 | <b>Title</b>   | <b>Publishers</b>                             | <b>Year of publication</b> |
|-------------|--------------------------------|--|---|----------------------------|
| <b>1</b>    | K.K Sinha                      | Business communication                                       | Vrinda Publication (P) Ltd                    | 2012                       |
| <b>2</b>    | C.S. Rayudu                    | Media and communication management                           | Himalaya Publishing House, Bombay.            | 2011                       |
| <b>3</b>    | Rajendra Pal and J.S Korlhalli | Essentials of Business communication                         | Sultan Chand & Sons, New Delhi.               | 2010                       |
| <b>4</b>    | Nirmal Singh                   | Business Communication ( Principles, Methods and Techniques) | Deep & Deep Publications Pvt.Ltd., New Delhi. | 2006                       |

**REFERENCE BOOKS:**

| <b>S.NO</b> | <b>Authors</b>                 | <b>Title</b>                    | <b>Publishers</b>            | <b>Year of publication</b> |
|-------------|--------------------------------|---------------------------------|------------------------------|----------------------------|
| 1           | M. Balasubrahmanyam            | Business communication          | Vikas publishing house Pvt., | 1979                       |
| 2           | N.S. Raghunathan& B. Santhanam | Business communication          | Marghampublications          | 2017                       |
| 3           | US Rai,SMRai                   | Business communication          | HPH                          | 2013                       |
| 4           | Penrose                        | Advanced Business Communication | South-Western Pub            | 2000                       |

**TEACHING METHODOLOGY:**

1. Chalk& Talk
2. Lecture
3. Seminar
4. Assignment
5. Chart preparation
6. PPT
7. Group Discussion
8. You tube class
9. Case study
10. Role play

**SYLLABUS DESIGNER:**

**Mrs. A.Kalaiselvi**, Assistant Professor, Department of Management Studies,  
D.K.M College for Women.

**PRODUCTION MANAGEMENT**

| Sem | Subject code | Category        | Lecture   |              | Theory    |              | Credit |
|-----|--------------|-----------------|-----------|--------------|-----------|--------------|--------|
|     |              |                 | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | Core paper - IV | 75        | 5            | 75        | 5            | 4      |

**COURSE OBJECTIVE:**

To familiarize learners with the production systems and enhance them to learn more about the plant location and layout, concepts of production planning and control, Dispatching, Quality control.

**On Successful completion Of the Course the student will be able:**

| <b>CO Number</b> | <b>CO STATEMENT</b>   | <b>Knowledge level (K1-K4)</b> |
|------------------|---|--------------------------------|
| <b>CO1</b>       | To study the production systems and production management.  | K1                             |
| <b>CO2</b>       | To study the importance of plant location and plant layout.   | K1                             |
| <b>CO3</b>       | To know and understand the concept of production planning and control   | K2                             |
| <b>CO4</b>       | To understand about the various concept of routing, scheduling and maintenance                                    | K2                             |
| <b>CO5</b>       | To know the various quality control measures and inspection, To learn more about work study and work measurement. | K2                             |

**K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze**

#### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | S          | S          | S          | S          | S          |
| <b>CO2</b> | M          | S          | S          | S          | M          | S          |
| <b>CO3</b> | S          | S          | M          | S          | S          | S          |
| <b>CO4</b> | S          | S          | M          | M          | S          | M          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

**S – Strong; M – Medium; L – Low**

#### **UNIT –I Introduction**

**15 Hours**

**Introduction** : Production Management – Definition – Scope – Objectives – Functions - Production systems – Product - Difference between Product& services- Types of Production –Relationship of production with other functional areas - Responsibilities of a Production Manager – Problems of production management.

**UNIT – II Plant location and plant layout****15 Hours**

**Plant Location:** Importance – Objectives – Factors influencing plant location – advantages and disadvantages of Urban, Suburban, Rural location – plant location problem.

**Plant layout:** Definition – Objectives – Principles – Principles – Factors influencing plant layout – Types of plant layout.

**UNIT - III Production Planning and Control 15Hours**

**Production planning and control :** Importance – Functions – Stages – Organisation for production planning and control – centralised and decentralised production planning and control – implementation – An integrated function – Measurement of effectiveness – problems of production planning and control

**UNIT - IV Routing ,Scheduling and Dispatching 15 Hours**

**Routing:** Definition - Importance - procedure - Factors affecting routing procedures. **Scheduling:** Definition – Objectives – Procedure for scheduling.

**Dispatching and follow up:** Dispatching rules – follow up – Needs – Types of follow up  
**Maintenance Management:** Objectives – Types – Advantages and Disadvantages.

**UNIT V: Quality control****15 Hours**

**Quality control:** Definition – Principles – Control charts – X charts – P charts -

Inspections – Types of inspections – Work study – Definition – objectives – Importance – Procedure – Method study – Definition – Objectives – steps of method study – Work measurement – Techniques of work measurement.

**TEXT BOOKS:**

| S.NO | Authors   | Title                               | Publishers          | Year of publication |
|------|---|-------------------------------------|---------------------|---------------------|
| 1    | Saravanel P and Sumathi S                                 | Production and Materials Management | Margham publication | 2016                |
| 2    | Gagan Deep Sharma<br>MandeepMahendru                      | Production Management               | Kalyani             | 2010                |
| 3    | Dr.P.T.VijayaRajakumar<br>Dr.Bhuvanewari and Dr.C.Ganesan | Operations Management               | Thakur              | 2014                |
| 4    | Production Management                                     | Production And Operations           | Tata McGraw-        | 2001                |

|          |              |                                      |                        |      |
|----------|--------------|--------------------------------------|------------------------|------|
|          |              | Management                           | Hill publishing co.ltd |      |
| <b>5</b> | Paneerselvam | Production And Operations Management | Prentice-Hall of India | 2006 |

#### REFERENCE BOOKS:

| <b>S.NO</b> | <b>Authors</b> | <b>Title</b>                          | <b>Publishers</b>          | <b>Year of publication</b> |
|-------------|----------------|---------------------------------------|----------------------------|----------------------------|
| <b>1</b>    | Harding HA     | Production Management                 | Macdonald and Evans        | 1974                       |
| <b>2</b>    | MM Varma       | Materials Management                  | Sultan chand and sons      | 2014                       |
| <b>3</b>    | Adam and Ebert | Production And Operations Management  | Prentice-Hall of India     | 1992                       |
| <b>4</b>    | SN Chari       | Production And Operations Management  | Tata McGraw-Hill Education | 1995                       |
| <b>5</b>    | Khanna OP      | Industrial Engineering and management | MartandTelsang             | 2006                       |

#### TEACHING METHODOLOGY :

- 1.Chalk& Talk
2. Lecture
3. Seminar
4. Assignment
5. Chart preparation
6. PPT
7. Group Discussion
8. You tube class
9. Case study
10. Role play

**SYLLABUS DESIGNER:**

**Mrs. A.Kalaiselvi**, Assistant Professor, Department of Management Studies,  
D.K.M College for Women

**VALUE EDUCATION**

| Sem | Subject code | Category        | Lecture   |              | Theory    |              | Credit |
|-----|--------------|-----------------|-----------|--------------|-----------|--------------|--------|
|     |              |                 | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| II  |              | Value Education | 30        | 2            | 30        | 2            | 2      |

**Course Objective:**

The main objective is to enable students to learn about moral values in life and the meaning of relationships, family and responsibility.

**UNIT - I INTRODUCTION TO VALUE EDUCATION 8 Hours**

Value Education – Definition – Relevance to present day – Concept of Human Values – Self introspection – Self Esteem.

**UNIT - II FAMILY VALUES 10 Hours**

Family values – Components, structure and responsibilities of family – Neutralization of anger – adjustability – Threats of family life – Status of women in family and society – Caring for needy and elderly – Time allotment for sharing ideas and concerns.

**UNIT - III ETHICAL VALUES 10 Hours**

Ethical values – Professional ethics – Mass media ethics – Advertising ethics – Influence of ethics on family life – Psychology of children and youth – Leadership qualities – Personality development.

**UNIT - IV SOCIAL VALUES 9 Hours**

Social values – Faith, service and secularism – Social sense and commitment – Students and Politics – Social awareness, Consumer awareness, Consumer rights and responsibilities – Redressal mechanisms.



## **UNIT - V GLOBALISATION**

**8 Hours**

Effect of International affairs on values of life. Issue of Globalization – Modern Warfare – Terrorism, Environmental issues – Mutual respect of different cultures, religions and their beliefs.

### **References:**

1. T. Anchukandam and J. Kuttianimathathil (Ed) Grow Free Live Free, KrisituJyothi Publications, Bangalore, (1995).
2. Mani Jacob (Ed) Resource Book for Value Education, Institute for Value Education, New Delhi, 2002.
3. DBNI, NCERT, SCERT, Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.
4. Daniel and Selvamony – Value Education Today, (Madras Charistian College, Tambaram and ALACHE, New Delhi, 1990).
5. S. Ignacimuthu – Values for life – Bette Yourself Books, Mumbai, 1991.
6. M.M.M.Mascaronhas Centre for Research Education Science an Training for Family Life Promotion – Family Life Education, Bangalore, 1993.

### **WEBS; TES AND e – LEARNING SOURCES:**

- [www.rkmissiondhel.org.education.html/](http://www.rkmissiondhel.org.education.html/)
- [www.clallam.org/lifestyleeducation.html/](http://www.clallam.org/lifestyleeducation.html/)
- [www.sun.com/..edu/progrmws/star.html/](http://www.sun.com/..edu/progrmws/star.html/)
- [www.infoscouts.com](http://www.infoscouts.com)
- [www.secretofsucces.com](http://www.secretofsucces.com)
- [www.lmillionpapers.com](http://www.lmillionpapers.com)
- [http:// militariyfinance.umuc.edu/education/edu-network.html](http://militariyfinance.umuc.edu/education/edu-network.html)

## **B.Sc (INFORMATION SYSTEM MANAGEMENT)**

### **DEPARTMENT OF MANAGEMENT STUDIES**

#### **B.Sc(ISM)**

### **PROGRAMME EDUCATIONAL OBJECTIVES**

**PEO1.**To Provide a thorough understanding of how organizations and societies use and exploit new information technologies and excellent preparation for a career in information systems management or management consultancy specializing in it.

**PEO2.**To provide a strong business related base of core modules, but includes techniques and applications focused on Information systems and management, to

operationalize the conceptual framework and build the competencies of an excellent and rounded business practitioner, in a highly technological environment.

### PROGRAMME OUTCOME

**PO1:**Students able to create business reports that effectively communicate business strategies, practices, and goals using emerging technology and management theories.

**PO2:**Design a solution to a business dilemma, incorporating management practices and theories with the principles of marketing, economics, accounting and finance.

**PO3:**Students Analyze business requirements to determine appropriate information systems solutions using current and emerging technologies.

**PO4:**The information systems curriculum prepares students for a position as decision support specialist, information systems specialist and system analysts.

**PO5:**To provide students to demonstrate mastery of **information technology skills and techniques needed to enable individuals and organizations to strategically compete** in the domestic and international marketplace

**PO6:** To prepare Students to exploit opportunitiesbeing newly created in the management profession.

## DEPARTMENT OF MANAGEMENT STUDIES

### B.SC (ISM)

#### SEMESTER- I

| S.NO | Part | Course title       | Subject code | Ins /H rs | Cr edit | Title of the paper               | Maximum marks |          |       |
|------|------|--------------------|--------------|-----------|---------|----------------------------------|---------------|----------|-------|
|      |      |                    |              |           |         |                                  | CIA           | Uni Exam | Total |
| 1    | I    | Language - I       |              | 6         | 4       | Tamil – I / Other language       | 25            | 75       | 100   |
| 2    | II   | English – I        |              | 6         | 4       | English – I                      | 25            | 75       | 100   |
| 3    | III  | Core paper – I     |              | 6         | 4       | Basics of Information Technology | 25            | 75       | 100   |
| 4    | III  | Core practical - I |              | 3         | 3       | Office Automation Lab            | 40            | 60       | 100   |

|   |     |                  |  |    |    |                               |     |     |     |
|---|-----|------------------|--|----|----|-------------------------------|-----|-----|-----|
| 5 | III | Allied paper – I |  | 7  | 5  | Basics of Managerial Concepts | 25  | 75  | 100 |
| 6 | IV  | EVS              |  | 2  | 2  | Environmental studies         | 25  | 75  | 100 |
|   |     | TOTAL            |  | 30 | 22 |                               | 165 | 435 | 600 |

## SEMESTER II

|    |     |                      |  |    |    |  |     |     |     |
|----|-----|----------------------|--|----|----|--|-----|-----|-----|
| 7  | I   | Language – II        |  | 6  | 4  | Tamil – II / Other language                | 25  | 75  | 100 |
| 8  | II  | English – II         |  | 4  | 4  | English – II                               | 25  | 75  | 100 |
| 9  | III | Core paper – II      |  | 6  | 4  | Internet and its Applications              | 25  | 75  | 100 |
| 10 | III | Core Practical II    |  | 3  | 3  | Internet and its Applications              | 40  | 60  | 100 |
| 11 | III | Allied paper – II    |  | 4  | 3  | Mathematical and statistics for management | 25  | 75  | 100 |
| 12 | III | Allied practical – I |  | 3  | 2  | Quantitative Techniques                    | 40  | 60  | 100 |
| 13 | IV  | Value education      |  | 2  | 2  | Value education                            | -   | 50  | 50  |
| 14 | IV  | Soft skills          |  | 2  | 1  | Soft skills                                | -   | 50  | 50  |
|    |     | TOTAL                |  | 30 | 23 |  | 180 | 520 | 700 |

## SEMESTER III

| S.N O | Part | Course title         | Subject code | Ins /H rs | Cr edi t | Title of the paper                   | CIA | Uni Exam | Tot al |
|-------|------|----------------------|--------------|-----------|----------|--------------------------------------|-----|----------|--------|
| 15    | I    | Language – III       |              | 6         | 4        | Tamil – III/ Other language          | 25  | 75       | 100    |
| 16    | II   | English – III        |              | 6         | 4        | English –III                         | 25  | 75       | 100    |
| 17    | III  | Core paper – III     |              | 4         | 4        | Programming in C and C++             | 25  | 75       | 100    |
| 18    | III  | Core practical – III |              | 3         | 3        | Practical : Programming in C and C++ | 40  | 60       | 100    |

|    |     |                         |  |    |    |                          |     |     |     |
|----|-----|-------------------------|--|----|----|--------------------------|-----|-----|-----|
| 19 | III | Allied paper – III      |  | 7  | 5  | Strategic Management     | 25  | 75  | 100 |
| 20 | IV  | Skill based subject – I |  | 2  | 2  | Training and Development | -   | 50  | 50  |
| 21 | IV  | Non – major – I         |  | 2  | 2  | Stress Management        | -   | 50  | 50  |
|    |     | TOTAL                   |  | 30 | 24 |                          | 140 | 460 | 600 |

*SEMESTER IV*

|    |     |                          |  |    |    |                               |     |     |     |
|----|-----|--------------------------|--|----|----|-------------------------------|-----|-----|-----|
| 22 | I   | Language – IV            |  | 6  | 4  | Tamil – IV/<br>Other language | 25  | 75  | 100 |
| 23 | II  | English – IV             |  | 6  | 4  | English –IV                   | 25  | 75  | 100 |
| 24 | III | Core paper – IV          |  | 4  | 4  | RDBMS                         | 25  | 75  | 100 |
| 25 | III | Core practical – IV      |  | 3  | 3  | Practical :<br>RDBMS          | 40  | 60  | 100 |
| 26 | III | Allied paper – IV        |  | 7  | 5  | Organizational behavior       | 25  | 75  | 100 |
| 27 | IV  | Skill based subject – II |  | 2  | 2  | E – Business                  | -   | 50  | 50  |
| 28 | IV  | Non – major – II         |  | 2  | 2  | Digital Marketing             | -   | 50  | 50  |
|    |     | Internship Training      |  |    | 2  |                               |     |     |     |
|    |     | TOTAL                    |  | 30 | 24 |                               | 140 | 460 | 600 |

**SEMESTER- V**

| <b>S. N O</b> | <b>Part</b> | <b>Course title</b> | <b>Subject code</b> | <b>In s/ Hr s</b> | <b>Cr ed it</b> | <b>Title of the paper</b> | <b>CIA</b> | <b>Uni Exam</b> | <b>Total</b> |
|---------------|-------------|---------------------|---------------------|-------------------|-----------------|---------------------------|------------|-----------------|--------------|
| 29            | III         | Core paper – V      |                     | 6                 | 3               | Multimedia                | 25         | 75              | 100          |

|    |     |                           |  |    |    |  |     |     |     |
|----|-----|---------------------------|--|----|----|--|-----|-----|-----|
|    |     |                           |  |    |    |  |     |     |     |
| 30 | III | Core paper – VI           |  | 7  | 4  | Web technology                                       | 25  | 75  | 100 |
| 31 | III | Core paper – VII          |  | 6  | 4  | Marketing Management                                 | 25  | 75  | 100 |
| 32 | III | Core practical–V          |  | 3  | 3  | Multimedia using Flash                               | 40  | 60  | 100 |
| 33 | III | Elective – I              |  | 3  | 3  | Human Resource Management                            | 25  | 75  | 100 |
| 34 | III | Elective – II             |  | 3  | 3  | Business Environment                                 | 25  | 75  | 100 |
| 35 | IV  | Skill based subject – III |  | 2  | 2  | Personality Development and Soft Skills for Business | -   | 50  | 50  |
|    |     | TOTAL                     |  | 30 | 22 |  | 165 | 485 | 650 |

#### SEMESTER –VI

| S.NO | Part | Course title         | Subject code | Ins /Hr s | Cre dit | Title of the paper                  | CIA | Uni Exam | Total |
|------|------|----------------------|--------------|-----------|---------|-------------------------------------|-----|----------|-------|
| 36   | III  | Core paper –VIII     |              | 8         | 4       | Programming in JAVA                 | 25  | 75       | 100   |
| 37   | III  | Core paper – IX      |              | 8         | 4       | Project                             | 25  | 75       | 100   |
| 38   | III  | Core practical – VI  |              | 3         | 3       | JAVA Programming and Web Technology | 40  | 60       | 100   |
| 39   | III  | Core practical – VII |              | 3         | 3       | Practical : Tally and GST Oriented  | 40  | 60       | 100   |
| 40   | III  | Elective –           |              | 3         | 3       | Technopreneurs                      | 25  | 75       | 100   |

|    |     |                          |  |    |     |                              |     |     |      |
|----|-----|--------------------------|--|----|-----|------------------------------|-----|-----|------|
|    |     | III                      |  |    |     | hip/ Technology Entrepreneur |     |     |      |
| 41 | III | Elective - IV            |  | 3  | 3   | Business Communication       | 25  | 75  | 100  |
| 42 | IV  | Skill based subject - IV |  | 2  | 2   | Business Ethics              | -   | 50  | 50   |
| 43 | V   | Extension Activities     |  | -  | 3   | Extension Activities         | 100 | -   | 100  |
|    |     |                          |  | 30 | 25  |                              | 280 | 470 | 750  |
|    |     |                          |  |    | 140 |                              |     |     | 3900 |

| PART     | SUBJECT             | PAPERS | CREDIT         | TOTAL CREDITS | MARKS | TOTAL MARKS |
|----------|---------------------|--------|----------------|---------------|-------|-------------|
| Part I   | Languages           | 4      | 4              | 16            | 100   | 400         |
| Part II  | English             | 4      | 4              | 16            | 100   | 400         |
| Part III | Allied (Theory)     | 4      | 3 (5)<br>1 (3) | 18            | 100   | 400         |
|          | Allied (Practical)  | 1      | 1 (2)          | 02            | 100   | 100         |
| Part III | Elective            | 4      | 3              | 12            | 100   | 400         |
| Part III | Core Theory         | 09     | 8 (4)<br>1 (3) | 35            | 100   | 900         |
| Part III | Core Practical      | 7      | 3              | 21            | 100   | 700         |
| Part IV  | EVS                 | 1      | 2              | 2             | 100   | 100         |
| Part IV  | Value Education     | 1      | 2              | 2             | 50    | 50          |
| Part IV  | Skill Based Subject |        |                |               |       |             |

|         |                      |   |   |     |     |      |
|---------|----------------------|---|---|-----|-----|------|
|         |                      | 4 | 2 | 8   | 50  | 200  |
| Part IV | Non – Major          | 2 | 2 | 4   | 50  | 100  |
| Part IV | Soft Skill           | 1 | 1 | 1   | 50  | 50   |
| Part V  | Extension Activities | - | 3 | 3   | 100 | 100  |
|         | Total                |   |   | 140 |     | 3900 |

### **BASICS OF MANGERIAL CONCEPT**

| <b>Sem</b> | <b>Subject code</b> | <b>Category</b> | <b>Lecture</b>   |                     | <b>Theory</b>    |                     | <b>Credit</b> |
|------------|---------------------|-----------------|------------------|---------------------|------------------|---------------------|---------------|
|            |                     |                 | <b>Total Hrs</b> | <b>Hrs per week</b> | <b>Total Hrs</b> | <b>Hrs per week</b> |               |
| <b>I</b>   |                     | Core paper - I  | 105              | 7                   | 105              | 7                   | 4             |

### **COURSE OBJECTIVE:**

This subject will enhance the students to learn about basic functions of management and organization structure.

### **COURSE OUTCOMES:**

**On Successful completion of the Course the student will be able:**

| <b>CO Number</b> | <b>CO STATEMENT</b>   | <b>Knowledge level(K1-K4)</b> |
|------------------|---|-------------------------------|
| <b>CO1</b>       | To acquaint the students with the fundamentals of management functions.                       | K1, k2                        |
| <b>CO2</b>       | To make clear and understand about planning and organization policies.                        | K2                            |
| <b>CO3</b>       | Various types of organization structure are clearly understand.                               | K2 , k3                       |
| <b>CO4</b>       | To Managing power and authority, responsibilities are understanding in several organizations. | K3                            |
| <b>CO5</b>       | Causes of conflicts and need for co-ordination clearly understand in an organization.         | K3                            |

**K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze**

**MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | M          | M          | M          | S          |
| <b>CO2</b> | M          | S          | M          | M          | M          | M          |
| <b>CO3</b> | M          | M          | M          | M          | S          | M          |
| <b>CO4</b> | M          | M          | M          | M          | M          | M          |
| <b>CO5</b> | M          | M          | M          | M          | M          | M          |

**S – Strong ; M – Medium; L – Low**

**UNIT- I Management**

**20 Hours**

**Concept of Management** – Scope – Nature - Functions - Evolution of Management Thought – Nature - Level of management - Functional areas of management - Management skills - Concept of Environment - Challenges of Indian Managers - Approaches to Meet Environment Challenges- Organization and the Environmental Factors – Trends and Challenges of Management In Global Scenario.

**UNIT- II Planning**

**20 Hours**

**Concept of Planning:** Nature- Importance- Steps-Types of Planning- Types of Plan- Barriers to Effective planning-Making planning effective -Concept of Forecasting - Policy and Procedures- Managing by objective (MBO) Strategies - Types of strategies – Policies - Concept of forecasting- Classification of forecasting techniques- Characteristic -Techniques of Forecasting–**Concept of Decision Making** - Types of Decision Making -Decision Making process-Techniques of Decision making process.

**UNIT- III Organizing**

**22 Hours**

**Concept of Organization and Organizing:** Nature –Process- Principles of Organization Factors Affecting Organization structure- Organization Structure.**Concept of- Departmentation:** Bases-Principles-Need-Types-Span of management-**Delegation of Authority:** Blocks to effective Delegation –Measures for Effective Delegation – Centralization and Decentralization. Power-Bases of power-**Concept of Authority:** Sources-Limits- Responsibility –Authority Relationships-Concept of line and staff Authority-Organization Manual.



**UNIT –IV Staffing and Directing****24 Hours**

**Recruitment:** Process-Recruitment policy-Recruitment organization-planning-Factors affecting Recruitment Policy and programme-Sources-Techniques-**Selection:**Concept-Nature-process-Selection Testing-Selection Interviewing-Barriers of selection-**Training and Development:**Objectives-Need-Importance-Distinguish between Training and Development-Process-Types-**Concept of Motivation:** Importance of Motivation-Types of Motivation-Theories of Motivation: Maslow's Need Hierarchy Theory-McClelland's Need Theory-McGregor's Theory X and Y Theory-Alderfer's ERGTheory-Vroom's Expectancy Theory- Porter Lawler Model of Motivation-Herzberg Theory-Problems in Motivation-Contingency Approach of Motivation.

**UNIT- V Control and Coordination****19 Hours**

**Fundamentals of Controlling: Concept** - Process - Need for Control –Importance-Types of Control:Budgetary Control and Non –Budgetary Control-Steps in Controlling-Source of Controlling-Techniques –Limitation-**Coordination:** Need-Importance –Steps-Types and principles of Coordination-Techniques of Effective Coordination-Difference between Coordination and Cooperation.

**TEXT BOOKS:**

| Sl. no | Authors                                 | Title                                 | Publishers                                  | Year of publication |
|--------|---|---------------------------------------|---|---------------------|
| 1      | L.M. Prasad                             | Principles and Practice of Management | Sultan Chand & Sons 8 <sup>th</sup> Edition | 2013                |
| 2      | J. Jayasankar                           | Principles of Management              | Margham publication                         | 2009                |
| 3      | R. Sivarethinamohan and P. Aranganathan | Principles of Management              | CBA Publication                             | 2011                |
| 4      | R.N.Gupta                               | Principles of Management              | Sultan Chand & sons                         | 2001                |
| 5      | Talloo                                  | Business organization and Management  | Tata McGraw Hill                            | 2007                |

**REFERENCE BOOKS:**

| S.N<br>O | Authors                             | Title                                    | Publishers                          | Year of<br>publicatio<br>n |
|----------|-------------------------------------|--|-------------------------------------|----------------------------|
| 1        | Hellriegel, Slocum & Jackson        | Management - A Competency Based Approach | Thomson South Western, 10th edition | 2007                       |
| 2        | Charles W L Hill, Steven L McShane, | Principles of Management                 | Mcgraw Hill                         | 2007                       |
| 3        | P.C.Tripathi& P.N.Reddy             | Principles of Management                 | Tata Mcgraw Hill                    | 1991                       |

**TEACHING METHODOLOGY:**

- 1.Chalk& Talk
- 2.Lecture
- 3.Seminar
4. Assignment
5. Chart preparation
6. PPT
7. Group Discussion
8. You tube class
- 9.Case study
10. Role play

**SYLLABUS DESIGNER:**

**Dr. E. Rebeka**, Assistant Professor, Department of Management Studies,  
D.K.M College for Women

**ENVIRONMENTAL STUDIES**

| Sem | Subject code | Category | Lecture   |              | Theory    |              | Credit |
|-----|--------------|----------|-----------|--------------|-----------|--------------|--------|
|     |              |          | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | EVS      | 30        | 2            | 30        | 2            | 2      |

### Course Objective:

The Objective of this paper is to acquaint the students to know the importance of the environment and to stimulate each individual to prevent the Natural resources.

### UNIT - I The Multidisciplinary nature of environmental studies 2 Hours

Definition, Scope and importance – Need for public awareness.

### UNIT - II Natural resources: Renewable and Non-renewable resources 7 Hours

Natural resources and associated problems.

- g) Forest resources: Use and over – exploitation, deforestation, case studies, Timber extraction, mining, dams and their effects on forests and tribal people.
- h) Water resources: Use and over – utilization of surface and ground water, floods, drought, conflicts over water, dams – benefits and problems.
- i) Mineral resources: Use and exploitation, environmental effects of extraction and using mineral resources, case studies.
- j) Food resources: World food problems, changes, caused by agriculture and overgrazing, effects of modern agriculture, fertilizer – pesticide problems, water logging, salinity, case studies.
- k) Energy resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources. Case studies.
- l) 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- III Ecosystems 7 Hours

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chain, food webs and ecological pyramids
- Introduction, types, characteristics features, structure and function of the following ecosystem:-
  - e) Forest ecosystem

- f) Grassland ecosystem
- g) Desert ecosystem
- h) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

#### **UNIT - IV Biodiversity and its conservation 7 Hours**

- Introduction – Definition: Genetics, species and ecosystem diversity.
- Biogeographical classification of India.
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as a mega – diversity
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, manwildlife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

#### **UNIT - V Environmental pollution 7 Hours**

##### Definition

- i) Causes, effects and control measures of
- j) Air pollution
- k) Water pollution
- l) Soil pollution
- m) Marine pollution
- n) Noise pollution
- o) Thermal pollution
- p) Nuclear hazards
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management: floods, earthquake, cyclone and landslides.

NB: Field visit is mandatory for Internal.

## VALUE EDUCATION

| Sem | Subject code | Category        | Lecture   |              | Theory    |              | Credit |
|-----|--------------|-----------------|-----------|--------------|-----------|--------------|--------|
|     |              |                 | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| II  |              | Value Education | 30        | 2            | 30        | 2            | 2      |

### Course Objective:

The main objective is to enable students to learn about moral values in life and the meaning of relationships, family and responsibility.

### UNIT - I INTRODUCTION TO VALUE EDUCATION 8 Hours

Value Education – Definition – Relevance to present day – Concept of Human Values – Self introspection – Self Esteem.

### UNIT - II FAMILY VALUES 10 Hours

Family values – Components, structure and responsibilities of family – Neutralization of anger – adjustability – Threats of family life – Status of women in family and society – Caring for needy and elderly – Time allotment for sharing ideas and concerns.

### UNIT - III ETHICAL VALUES 10 Hours

Ethical values – Professional ethics – Mass media ethics – Advertising ethics – Influence of ethics on family life – Psychology of children and youth – Leadership qualities – Personality development.

### UNIT - IV SOCIAL VALUES 9 Hours

Social values – Faith, service and secularism – Social sense and commitment – Students and Politics – Social awareness, Consumer awareness, Consumer rights and responsibilities – Redressal mechanisms.

### UNIT - V GLOBALISATION 8 Hours

Effect of International affairs on values of life. Issue of Globalization – Modern Warfare – Terrorism, Environmental issues – Mutual respect of different cultures, religions and their beliefs.

### References:

7. T. Anchukandam and J. Kuttianimathathil (Ed) Grow Free Live Free, KrisituJyothi Publications, Bangalore, (1995).

8. Mani Jacob (Ed) Resource Book for Value Education, Institute for Value Education, New Delhi, 2002.
9. DBNI, NCERT, SCERT, Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.
10. Daniel and Selvamony – Value Education Today, (Madras Charistian College, Tambaram and ALACHE, New Delhi, 1990).
11. S. Ignacimuthu – Values for life – Bette Yourself Books, Mumbai, 1991.
12. M.M.M.Mascaronhas Centre for Research Education Science an Training for Family Life Promotion – Family Life Education, Bangalore, 1993.

**WEBS; TES AND e – LEARNING SOURCES:**

- [www.rkmissiondhel.org.education.html/](http://www.rkmissiondhel.org.education.html/)
- [www.clallam.org/lifestyleeducation.html/](http://www.clallam.org/lifestyleeducation.html/)
- [www.sun.com/./edu/progrmws/star.html/](http://www.sun.com/./edu/progrmws/star.html/)
- [www.infoscouts.com](http://www.infoscouts.com)
- [www.secretofsucces.com](http://www.secretofsucces.com)
- [www.1millionpapers.com](http://www.1millionpapers.com)
- [http:// militariyfinance.umuc.edu/education/edu-network.html](http://militariyfinance.umuc.edu/education/edu-network.html)

**M. A ( HUMAN RESOURCE MANAGEMENT )**

**M.A (HRM) – Human Resource Management**

**Programme Educational Objectives (PEO) :**

**PEO 1 :**To provide the student with analytical skills to utilize Human Resources metrics and technological applications to enhance the effectiveness of recruitment, training, development and retention of human resources.

**PEO 2 :**To Enable the graduates to apply techniques in talent management, recruitment and compensation planning and to develop the student's ability to think critically and analyze opportunities to improve organizational performance through human resources management.

**PEO 3 :**To Strengthen the student's understanding how the alignment of human resources strategy with the organization as a whole and to develop the student's ability to make ethical decisions based on human resource professional standards and practices that are in the best interest of the organization.

**Programme Outcomes (PO) :**

**PO 1 :**To demonstrate proficiency in fundamental human resources, theories and concepts and how they apply to real business situations.

**PO 2:**Students will understand individual behavior in an organization and make effective business decisions.

**PO 3:**To enhance student's to learn about labour laws and various benefits offered to employees.

**PO 4:**To Prepare an understanding of the marketing strategies, international business norms , legal and ethical standards to be followed in a business.

**PO 5:**Students assume counseling skills so that they can work in groups and face various challenging situations.

**PO 6:**Students will have in depth knowledge about industrial relation and various acts provided for the welfare of employees.

## **DEPARTMENT OF MANAGEMENT STUDIES**

### **M.A - HUMAN RESOURCE MANAGEMENT**

#### **SEMESTER – I**

| <b>S. No</b> | <b>Part</b> | <b>Study Components</b> | <b>Ins.Hrs / Week</b> | <b>Credit</b> | <b>Title of the paper</b>                       | <b>Subject Code</b> | <b>CI A</b> | <b>Uni Exam</b> | <b>Total</b> |
|--------------|-------------|-------------------------|-----------------------|---------------|---|---------------------|-------------|-----------------|--------------|
|              |             | <b>Course Title</b>     |                       |               |   |                     |             |                 |              |
| 1            | Paper -I    | Core paper – I          | 6                     | 5             | Advanced Business Management                    |                     | 25          | 75              | 100          |
| 2            | Paper -II   | Core paper – II         | 6                     | 5             | Human Resource Management                       |                     | 25          | 75              | 100          |
| 3            | Paper -III  | Core paper – III        | 6                     | 4             | Labour Legislation - I                          |                     | 25          | 75              | 100          |
| 4            | Paper – IV  | Core paper – IV         | 6                     | 4             | Applied statistics for HR Managers              |                     | 25          | 75              | 100          |
| 5            | Paper – I   | Elective paper – I      | 6                     | 3             | 1. Compensation Management<br>2. Group Dynamics |                     | 25          | 75              | 100          |

|      |                | Self study paper - I |                | 2      | Business Ethics                         |              |     |           |       |
|------|----------------|----------------------|----------------|--------|---|--------------|-----|-----------|-------|
|      |                |                      | 30             | 21     |   |              | 125 | 375       | 500   |
|      | SEMESTER – II  |                      |                |        |   |              |     |           |       |
| 6    | Paper – V      | Core paper – V       | 6              | 5      | Organizational Behaviour                |              | 25  | 75        | 100   |
| 7    | Paper – VI     | Core paper – VI      | 6              | 5      | Quantitative Techniques for HR Managers |              | 25  | 75        | 100   |
| 8    | Paper – VII    | Core paper – VII     | 6              | 4      | Communication Skills for HR Managers    |              | 25  | 75        | 100   |
| 9    | Paper – VIII   | Core paper – VIII    | 5              | 4      | Labour Legislation - II                 |              | 25  | 75        | 100   |
| 10   | Paper – II     | Elective paper – II  | 5              | 3      | 1. Global HRM<br>2. HRIS                |              | 25  | 75        | 100   |
| 11   | Paper – I      | Compulsory paper     | 2              | 2      | Human Rights                            |              | 25  | 75        | 100   |
|      |                | Internship training  |                | 2      |   |              |     |           |       |
|      |                |                      | 30             | 23     |   |              | 150 | 450       | 600   |
|      | SEMESTER – III |                      |                |        |   |              |     |           |       |
| S.NO | PART           | STUDY COMPONENTS     | INS HRS / WEEK | CREDIT | TITLE OF THE PAPER                      | Subject Code | CIA | UNIV EXAM | TOTAL |
| 12   | Paper – IX     | Core paper – IX      | 6              | 5      | Talent Management                       |              | 25  | 75        | 100   |
| 13   | Paper – X      | Core paper – X       | 6              | 5      | Research Methodology                    |              | 25  | 75        | 100   |
| 14   | Paper – XI     | Core paper – XI      | 6              | 5      | Total Quality Management                |              | 25  | 75        | 100   |



|    |               |                          |    |    |  |  |     |     |      |
|----|---------------|--------------------------|----|----|--|--|-----|-----|------|
| 15 | Paper - XII   | Core paper -XII          | 6  | 5  | Electronic HRM   |  | 25  | 75  | 100  |
| 16 | Paper - III   | Elective paper – III     | 6  | 3  | 1. Corporate Governance<br>2. Business Policy and Strategic Management |  | 25  | 75  | 100  |
|    |               | Self study paper- II     |    | 2  | Research Aptitude  |  |     |     |      |
|    |               |                          | 30 | 23 |  |  | 125 | 375 | 500  |
|    | SEMESTER – IV |                          |    |    |  |  |     |     |      |
| 17 | Paper - XIII  | Core paper -XIII         | 5  | 5  | Entrepreneurial Development  |  | 25  | 75  | 100  |
| 18 | Paper - XIV   | Core paper -XIV          | 5  | 5  | Human Resource Development   |  | 25  | 75  | 100  |
| 19 | Paper - XV    | Core paper -XV           | 5  | 5  | Business Environment   |  | 25  | 75  | 100  |
| 20 | Paper - IV    | Elective paper – IV      | 5  | 3  | 1. People Management<br>2.. Industrial Relations and Labour Welfare    |  | 25  | 75  | 100  |
| 21 | Paper - I     | Project with viva - voce | 10 | 5  | Project  |  | 50  | 50  | 100  |
|    |               |                          | 30 | 23 |  |  | 150 | 350 | 500  |
|    |               |                          |    | 90 |  |  |     |     | 2100 |

**CONSOLIDATED STATEMENT**

| PART   | SUBJECT          | PAPERS | CREDIT          | TOTAL CREDIT | MARKS | TOTAL MARKS |
|--|------------------|--------|-----------------|--------------|-------|-------------|
| Part - III   | Core Theory      | 15     | 11 (5)<br>4 (4) | 55<br>16     | 100   | 1500        |
| Part - III   | Elective         | 4      | 3               | 12           | 100   | 400         |
|  | Compulsory Paper | 1      | 2               | 2            | 100   | 100         |
|  | Project          |        | 5               | 5            | 100   | 100         |
|  | Total            |        |                 | 90           |       | 2100        |
| Internship Training Program during summer vocation with an extra credit = 1 TO 2 |                  |        |                 |              |       |             |

**ADVANCED BUSINESS MANAGEMENT**

| Sem | Subject code | Category       | Lecture   |              | Theory    |              | Credit |
|-----|--------------|----------------|-----------|--------------|-----------|--------------|--------|
|     |              |                | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | Core paper - I | 90        | 6            | 90        | 6            | 5      |

**COURSE OBJECTIVE:**

Knowledge on the principles of management is essential for all kinds of organizations. This subject will enhance the students to learn about basic functions of management like planning, organizing, Delegation, Conflict and Coordination

**COURSE OUTCOMES:**

**On Successful completion Of the Course the student will be able:**

| CO Number | CO Statement   | Knowledge level(K1-K4) |
|-----------|--|------------------------|
| CO1       | To acquaint the students with the fundamentals of management functions.                          | K2                     |
| CO2       | To make clear and understand about planning and organization policies and organisation structure | K3                     |
| CO3       | To understand the how the jobs are discharged to the workers and authority relationship          | K3, K4                 |
| CO4       | To understand in what ways the workers are directed and motivated in several organisations.      | K3,K4                  |
| CO5       | To know about HR Audit and managing HR in Virtual organisations                                  | K3,K4                  |

**K1 – Remember; K2 – Understand; K3 – Apply; K4 –Analyze**

### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

**S – Strong ; M – Medium; L – Low**

### **UNIT- I Management**

**18 Hours**

**Concept of Management** – Importance - Scope - Nature of Management process - Functions - Levels of management - Functional areas of management-Management skills – Evolution of Management Thought - Management an art or Science or profession – Management and Administration – Roles of manager. **Concept of Environment** - Challenges of Indian Managers- Approaches to Meet Environment Challenges – Applying management theory in Practice – Role of management principles – Effective Management – Social ethical issues in Management

### **UNIT- II Planning and Organising**

**18 Hours**

**Concept of Planning:** Nature – Importance – Steps-Types of Planning- Types of Plan- Barriers to Effective planning-Making planning effective-- Mission and Purpose. Objectives - Management By Objectives– Strategy-Policy - Procedures –Methods and Rules – Project – Budget – Types –Concept of Forecasting - Characteristic and Techniques of Forecasting

**Decision Making** :Concept- Types -Decision making process-Effective Decision – Individual Vs. Group Decision making-Problem Solving – Approaches of Problem solving –Techniques of Decision making process.**Concept of Organizing** –Nature - Process – Principles of Organization Factors Affecting Organization structure - **Forms of Organization Structure:** Line Organization- Line and Staff Organization- Functional Organization- Divisional – Project –Matrix –Team based Organization.

### **UNIT- III Delegation of Authority and Decentralisation**

**18 Hours**

**Delegation of Authority:** Meaning – Characteristics – Element – Principles - Measures for Effective Delegation-Centralization and Decentralization-Concept of Authority: Sources - Limits- Responsibility .Organization Chart-Organization Manual.**Staffing:** Features – Responsibility – Importance – Factors affecting Staffing – Line and Staff Relationship – Recruitment – Sources – Selection Process – Training.

**UNIT-IV Direction and Controlling****18 Hours**

**Concept of Direction:** Principles – Features – Importance - Direction and Supervision- Effective Supervision – Order giving - Techniques of Directing - Directing and Human Factor-Models For Directing.**Fundamentals of Controlling:** Concept – Controlling and other Functions – Importance - Process of Controlling –Types of Control: Budgetary Control And Non –Budgetary Control – Steps in Controlling – Stages of Control

**UNIT-V Personnel Research and HR Audit****18Hours**

Personnel Research – Personnel Audit – Managing HR in virtual organizations : Meaning –Types of virtual organizations- Advantages and disadvantages of virtual organizations – Features of Virtual Organisations – HRM in virtual organisations

**TEXT BOOKS:**

| Sl. no | Authors                                 | Title                                 | Publishers                                  | Year of publication |
|--------|---|---------------------------------------|---|---------------------|
| 1      | L.M. Prasad                             | Principles and Practice of Management | Sultan Chand & Sons 8 <sup>th</sup> Edition | 2013                |
| 2      | J. Jayasankar                           | Principles of Management              | Margham publication                         | 2009                |
| 3      | R. Sivarethinamohan and P. Aranganathan | Principles of Management              | CBA Publication                             | 2011                |
| 4      | R.N.Gupta                               | Principles of Management              | Sultan Chand & sons                         | 2001                |
| 5      | Taloo                                   | Business organization and Management  | Tata McGraw Hill                            | 2007                |

**REFERENCE BOOKS:**

| Sl. no | Authors                             | Title                                    | Publishers                                      | Year of publication |
|--------|-------------------------------------|--|---|---------------------|
| 1      | Hellriegel, Slocum & Jackson        | Management - A Competency Based Approach | Thomson South Western, 10 <sup>th</sup> edition | 2007                |
| 2      | Charles W L Hill, Steven L McShane, | Principles of Management                 | Mcgraw Hill                                     | 2007                |

|          |                            |                          |                        |      |
|----------|----------------------------|--------------------------|------------------------|------|
| <b>3</b> | P.C.Tripathi&<br>P.N.Reddy | Principles<br>Management | of<br>Tata Mcgraw Hill | 1991 |
|----------|----------------------------|--------------------------|------------------------|------|

#### **TEACHING METHODOLOGY:**

- 1.Chalk& Talk
2. Lecture
3. Seminar
4. Assignment
5. Chart preparation
6. PPT
7. Group Discussion
8. You tube class
9. Case study
10. Role play

#### **SYLLABUS DESIGNER:**

**Dr. E. Rebeka**, Assistant Professor, Department of Management Studies, D.K.M College for Women

### **HUMAN RESOURCE MANAGEMENT**

| <b>Sem</b> | <b>Subject code</b> | <b>Category</b> | <b>Lecture</b>   |                     | <b>Theory</b>    |                     | <b>Credit</b> |
|------------|---------------------|-----------------|------------------|---------------------|------------------|---------------------|---------------|
|            |                     |                 | <b>Total Hrs</b> | <b>Hrs per week</b> | <b>Total Hrs</b> | <b>Hrs per week</b> |               |
| <b>I</b>   |                     | Core paper – II | 90               | 6                   | 90               | 6                   | 5             |

#### **COURSE OBJECTIVE:**

To learn about various functions of Human Resource Management like HRP, Job Analysis, HRD. Recruitment, Selection, Training and Performance Appraisal.

#### **COURSE OUTCOMES:**

**On Successful completion Of the Course the student will be able:**

| <b>CO Number</b> | <b>CO STATEMENT</b> | <b>Knowledge level(K1-K4)</b> |
|------------------|---------------------|-------------------------------|
|------------------|---------------------|-------------------------------|

|            |   |    |
|------------|---|----|
| <b>CO1</b> | To enhance the students to learn about nature of HRM  | K2 |
| <b>CO2</b> | To understand the concept of Recruitment and Selection process                                    | K3 |
| <b>CO3</b> | To have a better knowledge about Training and Performance Appraisal conducted in the Organisation | K3 |
| <b>CO4</b> | To understand the concept of Job evaluation and compensation system followed in the organisation  | K4 |
| <b>CO5</b> | To remember about transfer and promotion types followed in the organisation                       | K4 |

**K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze**

#### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | M          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | S          | M          |
| <b>CO3</b> | S          | M          | M          | S          | S          | S          |
| <b>CO4</b> | M          | S          | S          | S          | M          | S          |
| <b>CO5</b> | M          | S          | S          | M          | M          | M          |

**S – Strong ; M – Medium; L – Low**

#### **UNIT –I Nature of HRM**

**18Hours**

**HRM** : Introduction - Nature of Human Resource Management – Scope – Characteristics – Functions – Objectives – Importance – Evolution of HRM - A comparison of Personnel management and HRM – HRM as a profession –HRM in India — Qualities of HR manager **Introduction of Human Resource Planning (HRP)** : Concept – Objectives – Need and Importance – Process – Levels – Factors Affecting HRP – Problems in HRP – Guidelines / Measures to make HR planning Effective . **Job Analysis:** Concept – Procedure - Approaches – Factors Affecting Job design – Methods – Recent Trends in Job Redesign –Job Enrichment – Job Description – Job Specification

#### **UNIT –II Recruitment and selection**

**18 Hours**

**Recruitment:** Process – Recruitment Policy – Recruitment Organization – Recruitment Planning – Factors Affecting Recruitment Policy and Programme – Sources – Techniques – Recruitment Practices in India. **Selection:** Concept – Nature - Process – Selection Testing – Selection Interviewing – Barriers to Effective Selection – Selection

Process in India. **Placement:** Concept – Placement situations. **Induction:** Objectives – Advantages – Orientation Programme – Contents of Induction Programme – Requisites of an Effective Programme – Evaluation of Orientation Programme – Induction in Indian Industry.

### **UNIT-III Training and Performance Appraisal**

**18Hours**

**Employee Training:** Concept – Objectives - Need – Importance – Distinguish between Training and Development - Identification of Training need – Process - Types – Systematic Approach to Training – Methods. **Performance Management System :** Concept – Uses – Objectives – Process – Performance Management and Performance Appraisal – Performance Planning – Process and Documentation of Performance appraisal - Methods – PA Through MBO – 360 degree Appraisal Technique Counselling - Competency Mapping – Use of Technology and e- PMS – International Aspects of PMS, Performance systems Trends, Ethical Perspectives in Performance.

### **UNIT – IV Job Evaluation and compensation**

**18Hours**

**Job Evaluation:** Concept – Objectives – Methods of Job Evaluation – Procedure – Guidelines- Advantages – Limitations. **Career Planning:** Concept – Objectives – Elements of Career – Career planning in Organization – Need for the Career planning - Career planning VS HRP – **Compensation Management:** Concept of Compensation – Components – Objectives – Principles - Process – Factor Affecting Compensation – Methods of Wage Payment – Company Wage policy : Objectives – Concept of wages -- Wage Determination – Wage Determination Process – Wage Differentials - Pay Grades – Wage surveys –Modern Trends in Compensation -Wage Policy in India – Wage Incentives – Types of Wages – Theories of Wages - Competency based pay – Executive Compensation – Employee Stock Option Plans (ESOP).

### **UNIT -V Transfer and Promotion**

**18Hours**

**Transfer:** Need – Objectives – Types. **Promotion:** Promotion Policy – Demotion – Employee Separations and Employee Retention – Exit Interview – Stay Interview.

**HR Audit : HR Accounting:** Objectives – Benefits – Scope – Process – Advantages – Limitations – Human Resource Costs – Methods of Valuation of Human Resources – HR Accounting in India. **HR Audit :** Nature – Benefits – Scope – Approaches – Balance score card – Bench marking. **Human Resource Information System (HRIS):** Need – Computerized HRIS – Advantages and Uses of Computerized Human Resource – Designing a HRIS.

### **TEXT BOOKS:**

| <b>Sl. no</b> | <b>Authors</b> | <b>Title</b>               | <b>Publishers</b>                          | <b>Year of publication</b>       |
|---------------|----------------|----------------------------|--|----------------------------------|
| <b>1</b>      | C.B.Gupta      | Human Resource Management  | Sultan Chand & Sons                        | 15 <sup>th</sup> Edition<br>2015 |
| <b>2</b>      | K.Aswathappa   | Human Resource Management  | Tata McGraw Hill Education Private Limited | 4 <sup>th</sup> Edition<br>2011  |
| <b>3</b>      | P.C.Tripathi   | Human Resource Development | Sultan chand& sons                         | 6 <sup>th</sup> Edition<br>2010  |
| <b>4</b>      | L.M.Prasad     | Human Resource Management  | Sultan chand& sons                         | 2010                             |

#### **REFERENCE BOOKS:**

| <b>Sl.no</b> | <b>Authors</b>          | <b>Title</b>              | <b>Publishers</b>         | <b>Year of publication</b>       |
|--------------|-------------------------|---------------------------|---------------------------|----------------------------------|
| <b>1</b>     | Gary Dessler            | Human Resource Management | Prentice Hall of India    | 14 <sup>th</sup> Edition<br>2015 |
| <b>2</b>     | SeemaSanghi             | Human Resource Management | Macmillan                 | 2011                             |
| <b>3</b>     | Dr.S.S.Khanka           | Human Resource Management | Sultan Chand & Sons       | 2009                             |
| <b>4</b>     | C.B.Memoria&S.V. Gankar | Human Resource Management | Himalaya Publishing House | 2004                             |

#### **TEACHING METHODOLOGY:**

- 1.Chalk& Talk
2. Lecture
3. Seminar
4. Assignment
5. Chart preparation
6. PPT
7. Group Discussion
8. You tube class
9. Case study
10. Role play

#### **SYLLABUS DESIGNER:**

**Mrs. V.S Palaniammal**, Head of the Department & Assistant Professor, Department of Management Studies, D.K.M College for Women



## LABOUR LEGISLATION – I

| Sem | Subject code | Category         | Lecture   |              | Theory    |              | Credit |
|-----|--------------|------------------|-----------|--------------|-----------|--------------|--------|
|     |              |                  | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | Core paper - III | 90        | 6            | 90        | 6            | 4      |

### COURSE OBJECTIVE:

To develop the awareness among students about the various acts and legal compliance required for smooth functioning of the organization which is essential for all HR managers.

### COURSE OUTCOMES:

**On Successful completion Of the Course the student will be able:**

| CO Number  | CO Statement   | Knowledge Level<br>(K1 –K4) |
|------------|--|-----------------------------|
| <b>CO1</b> | To learn and understand the need of labour laws  | K 2                         |
| <b>CO2</b> | To learn the basic working conditions to be provided to the workers in an organization                                 | K3                          |
| <b>CO3</b> | To learn the laws relating to the child labour and contract labour   | K3,K4                       |
| <b>CO4</b> | To learn and understand the laws relating to the payment of wages and bonus provided to the workers in an organization | K3                          |
| <b>CO5</b> | To learn the law regulated in minimum wages paid to the workers in an organization                                     | K3,K4                       |

**K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze**

### MAPPING WITH PROGRAMME OUTCOMES

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | M          | S          | S          | M          | M          |
| <b>CO2</b> | S          | M          | S          | S          | S          | M          |
| <b>CO3</b> | S          | M          | M          | S          | M          | S          |
| <b>CO4</b> | M          | M          | S          | S          | S          | M          |
| <b>CO5</b> | M          | S          | M          | M          | M          | M          |

**S – Strong ; M – Medium; L – Low**

#### **UNIT-I Introduction to Labour legislation**

**18Hours**

**Introduction to labour law** – Origin - Definition – Objectives – Principles – Classification of labour laws – Evolution of labour legislation in India – International labour Organisation – Impact of International labour organization - Indian constitution in labour laws – Labour **legislation and Indian constitution**

Labour economics – Labour market – features – demand and supply of labour – nature and composition of Indian labour force.

#### **UNIT-II Laws relating to working conditions**

**18 Hours**

**Factories Act, 1948** : Definitions – Welfare measures under the act - Safety measures - Working hours for adults, employment of young persons, women – Annual leave with wages – Penalties and Procedures.

**Shops and establishments Act of 1961** – Activities of labour welfare board – Documents to be files by shops and owners – Documents filed for registration and its process – Plantation act of 1951- Leave and Safety

#### **UNIT-III Child and contract labour act**

**18 Hours**

Child labour – Objects- Definitions- Prohibition of children in certain occupations – Hours and periods of work – Conditions of work – Safety – Welfare and health measures for children and penalties

Contract labour – Definitions – Procedure for registration of establishment – Licencing – Obligations of employers to provide certain amenities – Payment of wages – Penalties – Consumer protection Act 1986

#### **UNIT –IV Payment of wages and payment of Bonus Act**

**18Hours**

**Payment of wages act , 1936** – Definitions – responsibility – time and deductions – recovery of amount – appeals – conditions where attachment of property can be made – penalties

**Payment of Bonus Act, 1966** – Definitions – Computation of gross profits – Computation of available surplus – Eligibility and disqualification for bonus – Minimum and maximum bonus –Time limit for payment of bonus – Calculations

## **UNIT –V The Minimum wages and Apprentices Act 18Hours**

**The minimum wages Act 1948** – Objectives – Definitions – Fixation and revision of wages – Procedure and fixing of minimum rate of wages – Advisory board and central board – Safeguard in Payment of minimum wages acts - Implementation – Exemption – Powers of Government.

**The Apprentices Act of 1969** – Definitions – Qualifications for engaged in apprentice - Contract – Minor – Number of apprentice – Period of training – Termination – Obligations of employer regarding hours of work – Safety and health measures – Penalties

Employment exchange act of 1959 – Definitions – Notification of vacancies – Right of access to records or documents – Exemptions – Penalties

### **TEXT BOOKS :**

| <b>Sl no</b> | <b>Authors</b>                | <b>Title</b>                                      | <b>Publishers</b>                | <b>Year of publications</b> |
|--------------|-------------------------------|---|----------------------------------|-----------------------------|
| 1.           | Kapoor N.D.                   | Elements of industrial law (11 <sup>th</sup> ed.) | New Delhi : Sultan Chand & Sons  | 2012                        |
| 2.           | ArunMonappa, RanjeetNambudiri | Industrial Relations and Labour Laws              | Tata McGraw Hill Private Limited | 2012                        |
| 3.           | PramodVerma                   | Management of Industrial Relations                | Reading and cases                | 2010                        |

### **REFERENCE BOOKS:**

| <b>Sl no</b> | <b>Authors</b>           | <b>Title</b>   | <b>Publishers</b>                                | <b>Year of publications</b> |
|--------------|--------------------------|--|--|-----------------------------|
| 1.           | Kumar, h.l.              | Labour laws Everybody should know (9 <sup>th</sup> ed.). | New Delhi : Universal law publishing co, Pvt Ltd | 2013                        |
| 2            | P. Saravanel and Sumathy | Legal Systems in Business                                | Sultan Chand and Sons                            | 2009                        |

### **TEACHING METHODOLOGY:**

1.Chalk& Talk

2. Lecture
3. Seminar
4. Assignment
5. Chart preparation
6. PPT
7. Group Discussion
8. You tube class
9. Case study
10. Role play

**SYLLABUS DESIGNER:**

**Mrs. A.Rama**, Assistant professor, Department of Management Studies, D.K.M College for Women

**COMPENSATION MANAGEMENT**

| Sem | Subject code | Category     | Lecture   |              | Theory    |              | Credit |
|-----|--------------|--------------|-----------|--------------|-----------|--------------|--------|
|     |              |              | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | Elective – I | 90        | 6            | 90        | 6            | 3      |

**COURSE OBJECTIVE :**

This course aims to clarify the principles and basic concepts of compensation management in organizations, including the role of human resource management in dealing with employees and methods to provide compensation.

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K1 –K4)</b> |
|------------------|---|---------------------------------|
| CO1              | To learn the basic compensation concepts and the context of compensation practice | K 3                             |
| CO2              | To illustrate different ways to strengthen the pay for performance                | K3                              |
| CO3              | To learn the concepts of payment and employee benefits                            | K3                              |
| CO4              | To understand the concept of dearness allowance and calculations                  | K3                              |
| CO5              | to learn the laws, rules relating to the compensations of industries              | K3                              |

#### **MAPPING WITH COURSE OBJECTIVE**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| K 2 | S   | S   | S   | S   | S   | S   |
| K3  | S   | S   | S   | S   | S   | S   |
| K3  | S   | S   | S   | S   | S   | S   |
| K3  | S   | S   | S   | S   | S   | S   |
| K3  | S   | S   | S   | S   | S   | S   |

**K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze**

#### **UNIT – I INTRODUCTION**

**18 HOURS**

Compensation – Meaning – Definition – Objectives – Importance – Purpose – Benefits – Factors affecting compensation – Compensation Management Process – Compensation Responsibilities – Strategic Compensation Planning – Compensation Design – Issues - Theories of Wages – Approaches – Philosophies

**UNIT – II WAGE AND SALARY ADMINISTRATION****18 HOURS**

Introduction – Meaning – Principles – Objectives – Wage policy – Types – Factors affecting wage policies – Methods of Wage Payment – Time wage – Merits – Demerits – Piece Wage – Merits – Demerits – Executive Compensation – Factors affecting executive compensation – Types of Reward system – Monetary – Non – Monetary benefits – Retention Strategy

**UNIT – III INCENTIVES****18HOURS**

Meaning – Objectives – Principles – Merits – Demerits – Factors affecting incentives – Constraints – Effective Incentive system – Methods – Individual – Group – Profit Sharing – Fringe Benefits – ESOP – Compensation in Multinational organizations – Gain sharing Incentives – Wage Boards

**UNIT – IV DEARNESS ALLOWANCES****18HOURS**

Dearness Allowance – Emergence and Growth – Calculation of D.A. with Salary – Problems – Voluntary Retirement Scheme – Golden Handshake – Retirement benefits – Competency Based Compensation – Reward System in Service organizations – Employee benefit programme

**UNIT – V LAWS RELATED TO COMPENSATION****18HOURS**

Payment of Wages Act – Payment of Minimum Wages Act – Payment of Bonus Act – Plantation Act – Mines Act – International Compensation – Expatriate compensation – Objectives – Elements – Problems – Security Benefits to Employees – Creating Work Life Setting – Collective Bargaining Strategies

**Text Books :**

| <b>Sl no</b> | <b>Authors</b>        | <b>Title</b>                                      | <b>Publishers</b>                | <b>Year of publications</b> |
|--------------|-----------------------|---|----------------------------------|-----------------------------|
| 1.           | L.M.Prasad            | Human Resource Management                         | New Delhi : Sultan Chand & Sons  | 2002                        |
| 2.           | DewakarGoel           | Performance Appraisal and Compensation Management | Prentice Hall India<br>New Delhi | 2008                        |
| 3.           | Richard. I. Henderson | Compensation Management in a Knowledge Based      | Prentice Hall India<br>New Delhi | 2008                        |

|  |  |       |  |  |
|--|--|-------|--|--|
|  |  | World |  |  |
|--|--|-------|--|--|

**Reference Books:**

| Sl no | Authors                          | Title   | Publishers                         | Year of publications |
|-------|----------------------------------|---|------------------------------------|----------------------|
| 1.    | Richard Thrope & Gill Homen      | Strategic Reward Systems                            | Prentice Hall India<br>New Delhi   | 2005                 |
| 2.    | Michael Armstrong & Helen Murlis | Handbook of Reward Management                       | Crust Publishing House             | 2007                 |
| 3.    | Bhatia S.K.                      | New Compensation Management in Changing Environment | Deep, Deep Publishers<br>New Delhi | 2003                 |
| 4.    | Chappra T.N.                     | Essentials of Organizational Behavior               | Dhanpat Rai New Delhi              | 2006                 |

**TEACHING METHODOLOGY:**

1. Chalk & Talk
2. Lecture
3. Seminar
4. Assignment
5. Chart preparation
6. PPT
7. Group Discussion
8. You tube class
9. Case study
10. Role play

**SYLLABUS DESIGNER:**

**Mrs. A.Rama**, Assistant professor, Department of Management Studies, D.K.M College for Women

## **GROUP DYNAMICS**

| <b>Sem</b> | <b>Subject code</b> | <b>Category</b> | <b>Lecture</b>   |                     | <b>Theory</b>    |                     | <b>Credit</b> |
|------------|---------------------|-----------------|------------------|---------------------|------------------|---------------------|---------------|
|            |                     |                 | <b>Total Hrs</b> | <b>Hrs per week</b> | <b>Total Hrs</b> | <b>Hrs per week</b> |               |
| <b>I</b>   |                     | Elective – I    | 90               | 6                   | 90               | 6                   | 3             |

### **UNIT I**

Group Dynamics – Understanding Groups, Phases of Group Development – Group Cohesion and Alienation – Conformity and Obedience

### **UNIT II**

Group and its formation – Formal and Informal Groups – Functions fulfilled by Group variables affecting the integration in groups of organizations Groups and Personal needs

### **UNIT III**

Training for Effective Group Membership – T-Group Training or Sensitivity Training – Process of Decision Making in Groups – Problems and Approaches for ‘Consensus’ formation – Effective Meetings

### **UNIT IV**

Theory and Model of Interpersonal Behaviour of C.WillianShutz – FIRO – B.Test – its application- achieving Group Compatibility – Problems in reaching compatibility

### **UNIT V**

Use of Groups in Organizations vs Industrial Performance – Inter group problems in Organisations – Inter Group Competition – Reducing Competition through Training – Conflict – Management of Conflict – Preventing Interpersonal Conflict and inter group Conflict. Achieving Group – Team work development

### **Reference Books:**

| <b>Sl no</b> | <b>Authors</b> | <b>Title</b>            | <b>Publishers</b> | <b>Year of publications</b> |
|--------------|----------------|-------------------------|-------------------|-----------------------------|
| 1.           | Eder Scheim    | Organisation Psychology | Tata mc graw Hill | 1997                        |



|    |                |                           |                                  |      |
|----|----------------|---------------------------|----------------------------------|------|
| 2. | DharaniP.Sinha | T-GroupDevelopment and OD | Tata mc graw Hill                | 1998 |
| 3. | G.WiiliamShutz | Interpersonal World       | Prentice Hall India<br>New Delhi | 2005 |

## **BUSINESS ETHICS**

| Sem | Subject code | Category   | Lecture   |              | Theory    |              | Credit |
|-----|--------------|------------|-----------|--------------|-----------|--------------|--------|
|     |              |            | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | Self Study | -         | -            | -         | -            | -      |

### **COURSE OBJECTIVE:**

To develop the awareness among students about the grounding of theory through the understanding of real life situations and to understand ethical issues in the workplace and be able to find a solution for most good. Students will identify and apply ethical principles to human decisions typical of business; analyze ethical positions taken on these matters; and formulate moral defenses of decisions, by completing course activities,

### **COURSE OUTCOMES:**

**On Successful completion of the Course the student will be able:**

| CO Number | CO Statement  | Knowledge level(K1-K4) |
|-----------|---|------------------------|
| CO1       | To exhibit basic knowledge on business ethics   | K2                     |
| CO2       | To make clear about ethical theory and ethics in business   | K3                     |
| CO3       | To understand the external contexts on business ethics in ecology and consumer  | K3, K4                 |
| CO4       | To measure the internal context on employees in the organization  | K3,K4                  |
| CO5       | Relate the significant issues of an ethical controversy in business to cross cultural, cross religion & cross racial issues | K3,K4                  |

**K1 – Remember; K2 – Understand; K3 – Apply; K4 –Analyze**

**MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

**S – Strong ; M – Medium; L – Low**

**UNIT- I Introduction to business ethics**

Definition and Nature of Business ethics - characteristics of business ethics - Need and benefit of business ethics -Role in various types of business structures.

**UNIT - II Ethical theory and Ethics in Business**

Management of Ethics - Ethics analysis [Hosmer model]; Ethical dilemma; Ethics in practice - ethics for managers; Role and function of ethical managers - Define responsibilities and obligations – Structure of business ethics.

**UNIT -III External context**

Ecology: The dimensions of pollution and resource depletion, the ethics of control, the ethics of conserving depletable resources. Consumers: -Markets and consumer Protection.

**UNIT- IV Internal context - Employee**

Job discrimination —Its nature and extent - Rights and justice - Affirmative action - Gender issues - The employee's obligation to the firm - The firm's duties to the employees - The employee Rights - Need for the organizational ethics program - Code of Conduct

**UNIT –V Business ethics in a global economy**

Ethical perceptions and international business, Global values, the multinational corporation and various ethical issues, cross cultural, cross religion & cross racial issues.

**TEXT BOOKS:**

| <b>Sl. no</b> | <b>Authors</b>                           | <b>Title</b>                              | <b>Publishers</b>         | <b>Year of publication</b> |
|---------------|--|---|---------------------------|----------------------------|
| 1             | S.A. Sherlekar                           | Ethics in Management                      | Himalaya Publishing House | 2009                       |
| 2             | William B. Werther and David B. Chandler | Strategic corporate social responsibility | Sage Publications Inc.,   | 2011                       |
| 3             | William H. Shaw                          | Business ethics                           | Cengage learning          | 2016                       |
| 4             | R.V. Badi & V.N. Badi                    | Business ethics                           | Vrinda Publications Ltd   |                            |
| 5             | B P Banerjee                             | Foundation of Ethics and Management       | Excel Books               | 2005                       |

#### **REFERENCE BOOKS:**

| <b>S.N O</b> | <b>Authors</b>   | <b>Title</b>                    | <b>Publishers</b>                         | <b>Year of publication</b> |
|--------------|------------------|---------------------------------|---|----------------------------|
| 1            | W.H. Shaw        | Business Ethics                 | Cengagelearning                           | 2007                       |
| 2            | Hartman, Laura P | Perspectives in Business Ethics | MCgraw Hill                               | 2001                       |
| 3            | O C Ferrell      | Business ethics                 | Biztantra                                 | 2012                       |
| 4            | CSV Murthy       | Business ethics, Text and Cases | Himalaya Publishing House, Second Edition | 2006                       |

#### **TEACHING METHODOLOGY**

Self Study

#### **SYLLABUS DESIGNER:**

**Dr. E. Veronica**, Assistant Professor, Department of Management Studies, D.K.M College for Women

#### **ORGANISATIONAL BEHAVIOUR**

| <b>Sem</b> | <b>Subject code</b> | <b>Category</b> | <b>Lecture</b>   |                     | <b>Theory</b>    |                     | <b>Credit</b> |
|------------|---------------------|-----------------|------------------|---------------------|------------------|---------------------|---------------|
|            |                     |                 | <b>Total Hrs</b> | <b>Hrs per week</b> | <b>Total Hrs</b> | <b>Hrs per week</b> |               |
| <b>II</b>  |                     | Core Paper V    | 90               | 6                   | 90               | 6                   | 5             |

**COURSE OBJECTIVE:**

To make students understand the concept of foundations of OB, personality, learning concepts, individual attitudes and values, group behaviour, organizational change and development.

**COURSE OUTCOMES:**

**On Successful completion Of the Course the student will be able:**

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge level(K1-K4)</b> |
|------------------|--|-------------------------------|
| <b>CO1</b>       | To Identify the human Behaviour activities within an organization.   | K2                            |
| <b>CO2</b>       | Recognise the workplace personality and perception through learning process.   | K3                            |
| <b>CO3</b>       | Identify the Importance of Attitude and to understand behaviour impact organizational Performance.   | K3                            |
| <b>CO4</b>       | Associate the behaviour of individuals and groups in organisations and identify the problems associated with organizing and managing teams . | K4                            |
| <b>CO5</b>       | To improve the Effectiveness of an organization.   | K4                            |

**K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze**

**MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | M          | S          | M          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | M          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          | S          |
| <b>CO4</b> | M          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | M          | M          | M          |

**S – Strong ; M – Medium; L – Low**

**UNIT –I Nature of Organisation**

**18 Hours**

**Nature of organisation** : Concept , Types, Significance, organisation as a system, organisational goals – Mission and Purpose , Determinants of organisation goals, organisation and Individual goals, Integrating organisation and Individual goals.

**Nature of organization Behaviour**– concept, scope, OB and other similar fields of studies, Disciplines contributing to OB – OB model. **Foundations of OB:** Environmental factors – Personal factors – Psychological factors.

## **UNIT - II Personality and Learning**

**18 Hours**

**Personality** : Concept - Personality theories - Personality Development - Determinants of personality - personality and behaviour - organisational applications of personality. **Perception** : Concept – Perceptual process - Perceptual selectivity - Perceptual Organisation – Perception and Organisation Behaviour - Interpersonal perception. **Learning** : Concept – Components of learning process - Objectives - Nature – Factors affecting learning - Learning theories - Principles - Reinforcement - Types of Reinforcement - OB Modification.

## **UNIT- III Attitudes and Values**

**18 Hours**

**Attitudes and values** : Concept of attitude - Nature - Formation - Functions – Theories - Factors in Attitude formation - Attitude Measurement - Method of Attitude change. **Value** : Concept - Types - Formation of values - Values and behaviour - Factors in Value formation , Value systems of Indian managers.

**Stress** : Concept – Causes - Sources - Effects of stress - Coping strategies for stress. **Interpersonal Behaviour** : Nature - Transactional Analysis - Life positions - Benefits and uses of TA.

## **UNIT - IV Group Behaviour**

**18 Hours**

**Group Behaviour** : Determinants - Group process - Group Tasks. Group Norms - Group Cohesiveness - Group Decision making - Techniques for Improving Group Decision making. **Organisational Conflicts** : Concept of conflict - Positive and Negative Aspects of conflicts - Individual level conflict - Goal conflict - Role conflict - Interpersonal conflict - Group level conflict - Organisation level conflict - Conflict management.

**Organisational climate and culture** : Concept of organisational climate - Developing a sound organisational climate - Participation and organisational climate - Morale - organisational culture - Socio – cultural Features of India and Their Impact .

## **UNIT – V Organisational Change and Development**

**18 Hours**

**Organisational change:** Nature – Factors in organisational change – Planned change – Process – Responses- Resistance to change – Factors in Resistance to change – Overcoming – Change Agents – Role of Change Agents – Organisational growth and change. **Organisational Development** : Concept – Process- OD Interventions – Sensitivity Training – Grid training – Survey feedback – Process consultation – Team Building – Management by Objectives .

**Organizational Effectiveness:** Concept – Approaches to Measure Effectiveness – Goal approach – Behavioural Approach – System Approach – Strategic Constituencies Approach – Maximisation of Effectiveness – Managerial Effectiveness - Factors in Organisational Effectiveness.

**TEXT BOOKS:**

| Sl. no | Authors   | Title   | Publishers           | Year of publication |
|--------|---|---|----------------------|---------------------|
| 1      | L.M. Prasad   | Organisational Behaviour                          | Sultan chand & sons  | 2004                |
| 2      | Stephen P. Robbins & Timothy A. Judge, Neharika Vohra | Organizational Behavior                           | Pearson              | 2013                |
| 3      | Pardeep Kumar & K.S. Thakur                           | Organizational Behavior (concepts & Applications) | Wisdom Publications  | 2011                |
| 4      | J. Jayasankar   | Organisational Behaviour                          | Margham Publications | 2016                |

**REFERENCE BOOKS:**

| Sl. no | Authors  | Title                                   | Publishers                  | Year of publication |
|--------|--|---|-----------------------------|---------------------|
| 1      | Wendy Bloisi, Curtis W. Cook & Phillip L. Hunsaker | Management and Organisational Behaviour | McGraw – Hill Companies     | 2003                |
| 2      | Dr. S.S. Khanka                                    | Organisational Behaviour                | S. Chand & Company pvt. Ltd | 2015                |

**TEACHING METHODOLOGY:**

1. Chalk & Talk
2. Lecture
3. Seminar
4. Assignment
5. Chart preparation

6. PPT
7. Group Discussion
8. You tube class
9. Case study
10. Role play

**SYLLABUS DESIGNER:**

**Mrs. V.S Palaniammal,**

Head of the Department & Assistant Professor,

Department of Management Studies,

**QUANTITATIVE TECHNIQUES FOR HR MANAGERS**

| Sem | Subject Code | Category | Lecture              |    | Theory                  |    | Practical | Credit |
|-----|--------------|----------|----------------------|----|-------------------------|----|-----------|--------|
| II  |              | Core     | 6 hrs<br>per<br>week | 90 | 6<br>hrs<br>per<br>week | 90 | -         | 5      |

**COURSE OBJECTIVE:**

This course aims to provide knowledge on how to apply the quantitative methods for taking effective business decisions.

**COURSE OUTCOMES:**

| CO Number | CO Statement   | Knowledge Level (K1 – K4) |
|-----------|--|---------------------------|
| CO1       | To interpret and analyze various quantitative techniques used by industries. | K2                        |

|     |  |    |
|-----|--|----|
| CO2 | To apply the inventory control concept in decision making.                             | K3 |
| CO3 | To apply quantitative techniques to technical problems in business management.         | K3 |
| CO4 | To critically evaluate the optimal job assignments for getting best possible solution. | K3 |
| CO5 | To grasp and inculcate queuing theory with effective models.                           | K4 |

*\*Knowledge Level: K1- Remember; K2- Understand; K3- Apply; K4 Analyse*

### **Mapping with Programme Outcomes**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | M   | S   | S   | M   | M   |
| CO2 | M   | S   | S   | M   | M   | S   |
| CO3 | S   | S   | M   | M   | S   | M   |
| CO4 | M   | M   | S   | M   | M   | S   |
| CO5 | S   | M   | S   | S   | S   | M   |

S-Strong; M-Medium; L-Low

### **Unit – I Quantitative Techniques and Network Analysis18 Hours**

Quantitative techniques – Meaning – Characteristics – Linear programming – Formulation method – Graphical method – Simplex Method – Maximization – Minimization (Big M Method) – Network analysis – Network diagram – PERT – CPM.

### **Unit – II Inventory control**

**18 Hours**

Inventory models – Meaning – Definition – General concepts – Various cost concepts – Techniques of Inventory control – Determination of stock levels – EOQ – Formula method – Tabular method.

### **Unit – III Transportation**

**18 Hours**

Transportation model – Definition – Formulation and selection of Transportation methods – North west corner – Least cost method – Vogel's approximation method – Unbalanced transportation problem – Degeneracy in Transportation problem.

### **Unit – IV Assignment**

**18 Hours**

Assignment Model – Definition – Formulation and solution of Assignment models – Simplex and Hungarian method – Unbalanced Assignment Problem.

### **Unit –V Queuing Theory**

**18 Hours**



Queuing theory – Meaning – Objectives – Elements/Structure of Queuing system – Limitations of Queuing theory – Application of Queuing models.

**DISTRIBUTION OF MARKS: THEORY 20% AND PROBLEMS 80%**

**TEXT BOOKS:**

| <b>S.No</b> | <b>Authors</b>            | <b>Title</b>            | <b>Publishers</b>     | <b>Year of Publications</b> |
|-------------|---------------------------|-------------------------|-----------------------|-----------------------------|
| 1           | P.R. Vittal and V. Malini | Operations Research     | Margham Publications  | 2005                        |
| 2           | P.R. Vittal               | Quantitative Techniques | Margham publications  | 2007                        |
| 3           | J.K. Sharma               | Operations research     | Sultan Chand and Sons | 2010                        |

**REFERENCE BOOKS:**

| <b>S.No</b> | <b>Authors</b> | <b>Title</b>                                | <b>Publishers</b>    | <b>Year of Publications</b> |
|-------------|----------------|---|----------------------|-----------------------------|
| 1           | PA. Navanitham | Business Statistics and Operations Research | Jai Publishers       | 2010                        |
| 2           | P.R Vital      | Business statistics and operation research  | Margham publications | 2016                        |

**TEACHING METHODOLOGY:**

- 1.Chalk& Talk
2. Lecture
3. Seminar
4. Assignment
5. Chart preparation
6. PPT
7. Group Discussion
8. You tube class
9. Case study
10. Role play

**SYLLABUS DESIGNER:****Mrs. V.S Palaniammal,**

Head of the Department & Assistant Professor, Department of Management Studies,  
D.K.M College for Women

**COMMUNICATIONAL SKILL FOR HR MANAGERS**

| Sem | Subject code | Category       | Lecture   |              | Theory    |              | Credit |
|-----|--------------|----------------|-----------|--------------|-----------|--------------|--------|
|     |              |                | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | Core paper - I | 90        | 6            | 90        | 6            | 4      |

**COURSE OBJECTIVE:**

Knowledge of communication management is essential for all kinds of organizations. This subject will enhance the students learning about the basic concept of business conversations in formal methods by business letter and various tools and barriers to communication were discussed and it overcome those barriers are educated in the subject and this subject is fully oriented with managers work an organization.

**COURSE OUTCOMES:**

**On Successful completion Of the Course the student will be able:**

| CO Number | CO Statement  | Knowledge level(K1-K4) |
|-----------|---|------------------------|
| CO1       | To acquaint the students with the fundamentals of the basic business of communication process   | K2                     |
| CO2       | To make clear and understand about letters, norms of letters, enquires and others business letters.with correspondence of bank,customers and etc. | K3                     |
| CO3       | Various types of interdepartmental culture and Corporate culture are clearly understood.  | K3, K4                 |
| CO4       | To know the types of reports and its barriers are focused.  | K3,K4                  |
| CO5       | To make clear about electronic communication and its types is discussed in this session.  | K3,K4                  |

**K1 – Remember; K2 – Understand; K3 – Apply; K4 –Analyze**

### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

**S – Strong ; M – Medium; L – Low**

### **UNIT- I Communication 18 Hours**

**Concept of communication:** communication –Meaning and significance for management-Types of Communication – process of communication –Media –Barriers and Gateways in Communication – Principle of Effective communication.

### **UNIT- IIBankCorrespondence**

**18 Hours**

Correspondence – Norms for Business Letters –Letter for different Kinds of situations – Personalized Standard Letters, Enquires, Customer’s Complaints and Adjustments – Collection Letters –Sales promotion letters – **Bank Correspondence:**Correspondence of Customers-Correspondence with Head Office- Correspondence with other banks – Correspondence with Public Authorities and Other Agencies.

### **UNIT -III Interdepartmental Communication**

**18 Hours**

Memos –Office Orders- Memorandums – Circulars – Notices – Representations and Requests –Specimen Representation and Requests.**Intercultural Communication:** Defining Culture – Need for Intercultural Communication – Components of Culture – Ethnocentrism –Stereotyping –Corporate Culture –Characteristics of Good Corporate Culture. **Cultural Variables:** Values –Customs-Religion-Food –Dress- Aesthetics – Hierarchy and Social Status –Time Orientation –Personal Space- Attitude and Posture.

### **UNIT- IV Reports**

**18 Hours**

Introduction –Importance –Oral and Written – Functional Areas of Reports - Special Features of a Reports- Types of Business Reports –Selecting a Suitable Type of Report – Preparing a Report- Organization of a Report – Short Reports – Organization of a Long Report –Characteristic of a Good Report –Traps to Avoid while Writing Reports – Reports by Individuals –Reports of Committees/ Sub –committees.

**UNIT –VElectronic Communication****18 Hours**

**Internet:** Different Types of Online Communication -Data conferencing-Instant messaging-Ebooks-Online chat-Electronic and web chatshows – Electronicbookmarking

Electronic brochures-Electronic content on CDs and DVDs -Online consultation - Electronic newsletter-Threats to the Internet –Meeting the Threats –**E-mail:** Introduction –Writing Effective E-mails –The language of E-mails-Twelve Golden Rules For Effective E-mails-Forwarding E- mails/Attachments –Video –conferencing – Personal Digital Assistant (PDA) - Smartphone-Interactive Voice Response System (IVRS)- Social networks like What apps, Friendster, myspace, Twitter and Facebook.

**TEXT BOOKS:**

| <b>Sl. no</b> | <b>Authors</b>                      | <b>Title</b>                     | <b>Publishers</b>                                | <b>Year of publication</b> |
|---------------|-------------------------------------|----------------------------------|--|----------------------------|
| <b>1</b>      | Pal, Rajendra and Korlahalli, J. S  | Essentials of Business .         | Sultan Chand & Sons                              | 2013                       |
| <b>2</b>      | Raisher                             | Business communication           | ATTBS  | 1976                       |
| <b>3</b>      | Krishna Mohan &MeeraBannerjee       | Developing Communication Skill   | Macmillan  | 1988                       |
| <b>4</b>      | Woolcott&Unwin                      | Mastering Business Communication | Macmillan  | 1983                       |
| <b>5</b>      | Murphy Herta A and Peck ,Charles E. | Effective Business Communication | 2 <sup>nd</sup> Ed., Tata McGraw Hill, New Delhi | 1976                       |

**REFERENCE BOOKS:**

| <b>S.N O</b> | <b>Authors</b>   | <b>Title</b>                        | <b>Publishers</b>   | <b>Year of publication</b> |
|--------------|--|-------------------------------------|---------------------|----------------------------|
| <b>1</b>     | <b>Courtland L. Bovee, John V. Thill, Barbara E. Schatzman</b> | <b>Business Communication Today</b> | <b>Prentice Hal</b> | 2003                       |
| <b>2</b>     | John V. Thill and Courtland L. Bovee,                          | Excellence in Business              | Pearson             | 2015                       |

|          |   |                                      |         |      |
|----------|---|--------------------------------------|---------|------|
|          |   | Communication                        |         |      |
| <b>3</b> | <u>Mary Ellen</u><br><u>Guffey and Dana</u><br><u>Loewy</u> | Essentials of Business Communication | Pearson | 2015 |

**TEACHING METHODOLOGY:**

1. Chalk & Talk
2. Lecture
3. Seminar
4. Assignment
5. Chart preparation
6. PPT
7. Group Discussion
8. Youtube class
9. Case study
10. Role play

**SYLLABUS DESIGNER:**

**Dr. E. Rebeka**, Assistant Professor, Department of Management Studies, D.K.M College for Women

**LABOUR LEGISLATION – II**

| Sem       | Subject code | Category        | Lecture   |              | Theory    |              | Credit |
|-----------|--------------|-----------------|-----------|--------------|-----------|--------------|--------|
|           |              |                 | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| <b>II</b> |              | Core paper – VI | 75        | 5            | 75        | 5            | 4      |

**COURSE OBJECTIVES:**

To develop the awareness among students about the various acts and legal compliance required for smooth functioning of the organization which is essential for all HR managers.

### **COURSE OUTCOMES:**

**On Successful completion Of the Course the student will be able:**

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level<br/>(K1 -K4)</b> |
|------------------|---|-------------------------------------|
| <b>CO1</b>       | To learn and understand the need of laws regarding the insurance act    | K 3                                 |
| <b>CO2</b>       | To understand the compensation rules followed in an organization        | K3                                  |
| <b>CO3</b>       | To learn the laws relating to the trade union regulated in India        | K3                                  |
| <b>CO4</b>       | To know the rules giving relaxation to the women workers in India       | K3                                  |
| <b>CO5</b>       | To learn the laws, rules and settling the disputes of industry in India | K3                                  |

**K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze**

### **MAPPING WITH PROGRAMME OUTCOMES:**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

**S – Strong; M – Medium; L – Low**

**UNIT-I Employee State Insurance Act 1948**

**15 Hours**

**Employee state insurance act 1948** : Objective – Definition – Applicability of the Act – Contribution and Calculation – Registration of Establishment – Benefits – Restrictions – Protection – Penalties

**Employee Provident fund** – Miscellaneous provisions act of 1952 – Definitions – Employees Pension Scheme – Establishment of Employees – Pension fund – Grant by Central Government – Employees Deposit linked Insurance Scheme – Framing and its functioning – Circumstances under which employees contribution can be recovered – Attachment of properties – Penalties – Offences by company's

## **UNIT-II Employees compensation**

**15 Hours**

**Employees' compensation act 1923** – Scope – Definition – Rules regarding employment – Occupational diseases – Amount of compensation – Calculations of compensation for (death, disablement) compensation when due – Distribution of compensation – IT Act 2006

## **UNIT-III Trade Union act of 1926**

**15 Hours**

**Trade union act of 1926** – scope – Definition – Agreements not affected by the act – Procedure for registration of trade unions – Cancellation of registration of trade union – Duties and liabilities of a trade union – Amalgamation and Dissolution of a trade union – Penalties

## **UNIT-IV Maternity benefit and Gratuity act**

**15 Hours**

**Maternity benefit act of 1961** – Scope – Definition – Prohibition of employment – Right to Maternity – Benefit – Payment of maternity – Benefit in certain cases – Dismissal during absence of pregnancy – Leave and Nursing breaks – Penalties

**Payment of gratuity act of 1972** – Scope – Applicable – Definition – Payment of gratuity on Termination – Forfeiture of gratuity – Compulsory insurance and Payment of gratuity – Nomination – Determination – Recovery of gratuity – Penalties

## **UNIT-V Industrial Dispute and Standing Orders**

**15 Hours**

**Industrial dispute act of 1947** – Scope and extent of the act – Definition – Procedure for settlement of industrial dispute – Prohibition of strikes – Lock outs – Matter under the purview of labour court and industrial tribunal – Notice of change in conditions of service – Voluntary reference of disputes to arbitration – Award settlement

**Industrial employment standing orders 1946** -objects – Definition – Scope – Establishment to which this act does not apply – Procedure for submission of draft standing orders – Conditions for certification of standing orders – Payment of subsistence allowance – Penalties

## **TEXT BOOKS :**

| <b>Sl no</b> | <b>Authors</b>                | <b>Title</b>                                      | <b>Publishers</b>                | <b>Year of publications</b> |
|--------------|-------------------------------|---|----------------------------------|-----------------------------|
| <b>1.</b>    | Kapoor N.D.                   | Elements of industrial law (11 <sup>th</sup> ed.) | New Delhi : Sultan Chand & Sons  | 2012                        |
| <b>2.</b>    | ArunMonappa, RanjeetNambudiri | Industrial Relations and Labour Laws              | Tata McGraw Hill Private Limited | 2012                        |
| <b>3.</b>    | PramodVerma                   | Management of Industrial Relations                | Reading and cases                | 2010                        |

#### **REFERENCE BOOKS:**

| <b>Sl no</b> | <b>Authors</b>           | <b>Title</b>   | <b>Publishers</b>                                | <b>Year of publications</b> |
|--------------|--------------------------|--|--|-----------------------------|
| <b>1.</b>    | Kumar, h.l.              | Labour laws Everybody should know (9 <sup>th</sup> ed.). | New Delhi : Universal law publishing co, Pvt Ltd | 2013                        |
| <b>2.</b>    | B.O.Sharma               | Art of conciliation and industrial unrest                | Labour consultancy Bureau, Bombay                | 1985                        |
| <b>3.</b>    | P. Saravanel and Sumathy | Legal Systems in Business                                | Sultan Chand and Sons                            | 2009                        |

#### **TEACHING METHODOLOGY:**

- 1.Chalk& Talk
2. Lecture
3. Seminar
4. Assignment
5. Chart preparation
6. PPT
7. Group Discussion
8. You tube class
9. Case study



10. Role play

**SYLLABUS DESIGNER:**

**Mrs. A.Rama**, Assistant professor, Department of Management Studies, D.K.M College for Women

**GLOBAL HRM**

| Sem | Subject code | Category            | Lecture   |              | Theory    |              | Credit |
|-----|--------------|---------------------|-----------|--------------|-----------|--------------|--------|
|     |              |                     | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | Elective Paper - II | 75        | 5            | 75        | 5            | 3      |

**COURSE OBJECTIVE:**

The objective of this course is to familiarize the students with the global culture in international context. This course aims to introduce students to the theory and practices of global HRM. The students will be able to understand the various issues relating to global recruitment, selection, performance appraisal and compensation.

**COURSE OUTCOMES:**

**On Successful completion Of the Course the student will be able:**

| CO Number | CO Statement   | Knowledge level(K1-K4) |
|-----------|--|------------------------|
| CO1       | To make the students understand the basic concepts of globalisation with respect to global business environment. | K2                     |
| CO2       | To make them aware of various cultures across the globe.   | K2, K4                 |
| CO3       | To enable them to focus on global recruitment, selection, staffing and compensation issues                       | K2, K4                 |
| CO4       | To help the students to understand the various concepts relating to performance appraisal in global context.     | K2                     |
| CO5       | To make them understand about issues relating to global compensation.  | K2, K3                 |

**K1 – Remember; K2 – Understand; K3 – Apply; K4 –Analyze**

## MAPPING WITH PROGRAMME OUTCOMES

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| <b>CO1</b> | S          | S          | S          | S          | S          | S          |
| <b>CO2</b> | S          | S          | S          | S          | S          | S          |
| <b>CO3</b> | S          | S          | S          | S          | S          | S          |
| <b>CO4</b> | S          | S          | S          | S          | S          | S          |
| <b>CO5</b> | S          | S          | S          | S          | S          | S          |

**S – Strong ; M – Medium; L – Low**

### **UNIT- I Globalisation 15 Hours**

Globalisation – HR in global business environment – Approaches to global HRM – Difference between domestic HRM and global HRM – Knowledge economy – meaning of Knowledge in global HRM – Tapping Tacit knowledge – Knowledge workers – Challenges of global HRM

### **UNIT- II Global culture**

**15 Hours**

Understanding Diversity – Cross Cultural Negotiations – Role of Culture in Global HRM – Types of organizational culture – Managing people in international context – Structural framework of cross cultural analysis.

### **UNIT -III Global Staffing**

**15 Hours**

Global Staffing : Different approaches to multinational Staffing - Global Recruitment :Meaning – Recruitment methods in global HRM – Cross National Advertising - E-Recruitment – Selection in Global context : Advantages and Disadvantages of Selection methods – Selection tests in Global HRM, Interview Techniques.

### **UNIT- IV Performance Appraisal in International Context 15 Hours**

Performance Appraisal in Global HRM, Appraisal of Expatriate, Third and Host country employees – Issues and Challenges in International Performance Appraisal.

### **UNIT –VGlobal Compensation**

**15 Hours**

Global Compensation- Meaning– Forms – Factors influencing Compensation policy, Key components of Global compensation – Approaches to global compensation.

### **TEXT BOOKS:**

| <b>Sl. no</b> | <b>Authors</b> | <b>Title</b> | <b>Publishers</b> | <b>Year of publication</b> |
|---------------|----------------|--------------|-------------------|----------------------------|
|               |                |              |                   |                            |

|          |   |  |                            |      |
|----------|---|--|----------------------------|------|
| <b>1</b> | K.Aswathappa                                      | International HRM                      | Tata McGraw Hill Education | 2007 |
| <b>2</b> | K.Aswathappa&Sadhna Dash                          | International HRM                      | Tata McGraw Hill Education | 2017 |
| <b>3</b> | S.C.Gupta   | International HRM                      | Laxmi Publications         | 2006 |
| <b>4</b> | Michael Dickmann, Chris Brewster and Paul Sparrow | IHRM, Contemporary HR issues in Europe | Routledge                  | 2016 |

**REFERENCE BOOKS:**

| <b>S.N O</b> | <b>Authors</b>           | <b>Title</b>   | <b>Publishers</b>                   | <b>Year of publication</b> |
|--------------|--------------------------|--|-------------------------------------|----------------------------|
| <b>1</b>     | Mohan Thite              | <b>Managing people in the new economy</b>            | <b>Saga Publications, New Delhi</b> | 2004                       |
| <b>2</b>     | Dr.Victor Louis Anthuvan | The Dynamics and the impact of Globalisation         | Amirtham Publications, Madurai      |                            |
| <b>3</b>     | Adler N.J.               | International Dimensions of Organisational Behaviour | Kent Publishing                     | 1991                       |

**TEACHING METHODOLOGY:**

1. Chalk & Talk
2. Lecture
3. Seminar
4. Assignment
5. Chart preparation
6. PPT
7. Group Discussion
8. You tube class
9. Case study
10. Role play

**SYLLABUS DESIGNER:**

**R.Maheshwari**, Assistant Professor, Department of Management Studies, D.K.M College for Women

## HUMAN RESOURCES INFORMATION SYSTEM

| Sem | Subject code | Category            | Lecture   |              | Theory    |              | Credit |
|-----|--------------|---------------------|-----------|--------------|-----------|--------------|--------|
|     |              |                     | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | Elective Paper - II | 75        | 5            | 75        | 5            | 3      |

**Objective :** This subject deals with the students, how human resources can be maintained with information system.

### UNIT-I – DATA & INFORMATION NEEDS FOR HR MANAGER – 15 HOURS

Introduction – Data & Information needs for HR Manager; Sources of Data; Role of ITES in HRM; IT for HR Managers; Concept, Structure, & Mechanics of HRIS; programming Dimensions & HR Manager with no technology background; Survey of software packages for Human Resource Information System including ERP software such as SAP, Oracles financials and Ramco's Marshal (only data input, output & screens);

### UNIT-II - DATA MANAGEMENT FOR HRIS

**15 HOURS**

Data Management for HRIS – Data Formats, Entry Procedure & Process; Data Storage and Retrieval; Transaction Procession, office Automation and information processing and control functions; Design of HRIS: Relevance of Decision Making Concepts for information system Design; HRM needs analysis – Concept and Mechanics; Standard Software and Customized Software; HRIS – An Investment.

### UNIT-III - HR MANAGEMENT PROCESS

**15 HOURS**

HR Management Process & HRIS – Modules on Mpp, Recruitment, Selection, Placement, Module on PA system; T and D Module; Module on pay A and Related Dimensions; Planning and Control; Information System's support for Planning and Control.

### UNIT-IV - HRIS – ORGANIZATION STRUCTURE

**15 HOURS**

HR Management Process II and HRIS – Organization Structure & Related Management Process including authority and Responsibility Flows, and Communication Process;

Organization Culture and Power – Data Capturing for Monitoring and Review; Behavioral patterns of HR and Other Managers and their place in information procession for Decision Making.

#### **UNIT-V - STYLE OF ORGANIZATION – 15 HOURS**

Security, Size and Style of organization and HRIS security of Data and Operations of HRIS Modules; Common Problems during IT adoption efforts and process to overcome; Orientation and Training Modules for HR & Other Functionaries; Place and Substance of HRIS and SMES-Detailed Analytical Framework; Opportunities for combination of HRM & ITES Personnel; HRIS and Employee Legislation; An Integrated View of HRIS; Why and How of Winners and Losers of HRIS Orientation.

#### **REFERENCE BOOKS:**

| <b>S.N<br/>O</b> | <b>Authors</b>    | <b>Title</b>   | <b>Publishers</b>                   | <b>Year of<br/>publication</b> |
|------------------|-------------------|--|-------------------------------------|--------------------------------|
| <b>1</b>         | Dr.Michael Hammer | The Agenda: What Every Business Must Do to Dominate the Decade | Tata mc graw Hill                   | 1997                           |
| <b>2</b>         | Michael Armstron  | HRM Practices  | Tata mc graw Hill                   | 1998                           |
| <b>3</b>         | Jack J Philips    | Accountability in HRM  | Prentice Hall<br>India<br>New Delhi | 2005                           |

#### **HUMAN RIGHTS**

| <b>Sem</b> | <b>Subject code</b> | <b>Category</b>    | <b>Lecture</b>   |                     | <b>Theory</b>    |                     | <b>Credit</b> |
|------------|---------------------|--------------------|------------------|---------------------|------------------|---------------------|---------------|
|            |                     |                    | <b>Total Hrs</b> | <b>Hrs per week</b> | <b>Total Hrs</b> | <b>Hrs per week</b> |               |
| <b>II</b>  |                     | Compulsory Paper I | 30               | 2                   | 30               | 2                   | 2             |

#### **Course Objective:**

The main objective of this subject is to learn about human rights and have an deep insight about UN and its declarations with regard to various global human rights.

#### **UNIT-I Introduction to Human Rights**

**6 Hours**

Definition of Human Rights – Nature, Content, Legitimacy and Theories on Human Rights – Historical Development of Human Rights.

**UNIT –II International Rights**

**10 Hours**

International Human Rights – Prescription and Enforcement upto world war II - Human Rights and the UNO – Universal Declaration of Human Rights – International Covenant on Civil and Political Rights – International con-re jant on economic, Social and Cultural Rights and Optional Protocol.

**UNIT-III Human Rights Declaration**

**3 Hours**

Human Rights Declaration – U.N. Human Rights Declarations – U.N. Human Commissioner

**UNIT-IV Human Rights in Europe and Africa**

**5 Hours**

Amnesty International – Human Rights and Helsinki Process – Regional Developments – European Human Rights System – African Human Rights System – International Human Rights in Domestic Courts.

**UNIT-V Rights of Minorities**

**6 Hours**

Contemporary issues on Human Rights : Children's Rights – Women's Rights – Dalit's Rights – Bonded Labour and wages – Refugees - Capital Punishment – Fundamental rights in the Indian Constitution – Directive Principles of State Policy – Fundamental Duties – National Human Rights Commission.

**Reference Books:**

HUMAN RIGHTS ByT.S.Ravi – Margham Publications

**DEPARTMENT OF PSYCHOLOGY**

**Programme Educational Objectives (PEO)**

Undergraduate of Psychology will

**PEO 1:** Furnish the students with necessary basic supplements in many areas of psychology namely clinical, social, industrial, educational and counselling psychology in order to learn the theories and apply those in everyday interactions in the society to serve the one who seek support in psychological aspects.

**PEO 2:** Let the students to understand the aspects of life and to answer questions about why and how the people behave the way they do after learning the methodologies of knowing their cognition and social background.

### **Programme Outcomes (PO)**

On completion of B.Sc Psychology students are expected to

**PO1:** Identify human cognition and behavior that changes as society demands.

**PO2:** Recall the theoretical approaches of psychology in order to pursue postgraduate in same stream

**PO3:** Classify the mental health problems of people within psychological structure in order to carry out treatments

**PO4:** Relate the societal demands tactically as they get trained in life skill developmental during their course of study.

**PO 5:** Prepare the students professionally by starting up own venture individually or as a team in various psychological sub fields.

**PO 6:** Render service in educational, industrial, clinical and counselling settings.

## **DEPARTMENT OF PSYCHOLOGY**

### **B.Sc Psychology- CBCS Pattern**

The Course of Study and the Scheme of Examination

| S.No | Part         | Study Components<br>Course Title | Ins.<br>Hrs/<br>Week | Credit | Title of the Paper    | Maximum Marks |              |       |
|------|--------------|----------------------------------|----------------------|--------|-----------------------|---------------|--------------|-------|
|      |              |                                  |                      |        |                       | CIA           | Univ<br>Exam | Total |
|      | Semester – I |                                  |                      |        |                       |               |              |       |
| 1.   | I            | Language-I                       | 6                    | 4      | Tamil/ Other language | 25            | 75           | 100   |
| 2.   | II           | English-I                        | 6                    | 4      | English               | 25            | 75           | 100   |
| 3.   | III          | Core Theory-I                    | 5                    | 4      | Basic Psychology – I  | 25            | 75           | 100   |

|                      |     |                 |           |           |  |            |            |            |
|----------------------|-----|-----------------|-----------|-----------|--|------------|------------|------------|
| 4.                   | III | Core Theory-II  | 5         | 4         | Developmental Psychology –I              | 25         | 75         | 100        |
| 5.                   | III | Allied-I        | 6         | 5         | Research and statistics in Psychology    | 25         | 75         | 100        |
| 6.                   | IV  | EVS             | 2         | 2         | Environmental Studies                    | 25         | 75         | 100        |
|                      |     |                 | <b>30</b> | <b>23</b> |  | <b>150</b> | <b>450</b> | <b>600</b> |
| <b>Semester – II</b> |     |                 |           |           |  |            |            |            |
| 1.                   | I   | Language-II     | 6         | 4         | Tamil/ Other Language                    | 25         | 75         | 100        |
| 2.                   | II  | English-II      | 4         | 4         | English                                  | 25         | 75         | 100        |
| 3.                   | III | Core Theory-III | 5         | 4         | Basic Psychology – II                    | 25         | 75         | 100        |
| 4.                   | III | Core Theory-IV  | 5         | 4         | Developmental Psychology- II             | 25         | 75         | 100        |
| 5.                   | III | Allied-II       | 6         | 5         | Educational Psychology                   | 25         | 75         | 100        |
| 6.                   | IV  | Value Education | 2         | 2         | Value Education                          |            | 50         | 50         |
| 7.                   | IV  | Soft Skills     | 2         | 1         |  |            | 50         | 50         |
|                      |     |                 | <b>30</b> | <b>24</b> |  | <b>125</b> | <b>475</b> | <b>600</b> |
| <b>Semester III</b>  |     |                 |           |           |  |            |            |            |
| 1.                   | I   | Language-III    | 6         | 4         | Tamil/ Other Language                    | 25         | 75         | 100        |
| 2.                   | II  | English-III     | 6         | 4         | English                                  | 25         | 75         | 100        |
| 3.                   | III | Core Theory-V   | 4         | 4         | Positive Psychology                      | 25         | 75         | 100        |
| 4.                   | III | Core Theory-VI  | 4         | 4         | Abnormal Psychology- I                   | 25         | 75         | 100        |
| 5.                   | III | Allied-III      | 6         | 5         | Industrial and Organizational Psychology | 25         | 75         | 100        |
| 6.                   | IV  | NME-I           | 2         | 2         | Psychology of Adjustment- I              |            | 50         | 50         |
| 7.                   | IV  | SBS-I           | 2         | 2         | Life Skills Education                    |            | 50         | 50         |
|                      |     |                 | <b>30</b> | <b>25</b> |  | <b>125</b> | <b>475</b> | <b>600</b> |

|                     |     |                 |   |   |                       |    |    |     |
|---------------------|-----|-----------------|---|---|-----------------------|----|----|-----|
| <b>Semester –IV</b> |     |                 |   |   |                       |    |    |     |
| 1.                  | I   | Language-IV     | 6 | 4 | Tamil/ Other Language | 25 | 75 | 100 |
| 2.                  | II  | English-IV      | 6 | 4 | English               | 25 | 75 | 100 |
| 3.                  | III | Core Theory-VII | 4 | 4 | Consumer Psychology   | 25 | 75 | 100 |



|                    |     |                        |            |            |                              |            |             |             |
|--------------------|-----|------------------------|------------|------------|------------------------------|------------|-------------|-------------|
| 4.                 | III | Core Theory-VIII       | 4          | 4          | Abnormal Psychology-II       | 25         | 75          | 100         |
| 5.                 | III | Allied-IV              | 6          | 5          | School Counselling           | 25         | 75          | 100         |
| 6.                 | IV  | NME-II                 | 2          | 2          | Health and Wellbeing         |            | 50          | 50          |
| 7.                 | IV  | SBS-II                 | 2          | 2          | Stress Management            |            | 50          | 50          |
|                    |     |                        | <b>30</b>  | <b>25</b>  |                              | <b>125</b> | <b>475</b>  | <b>600</b>  |
| <b>Semester V</b>  |     |                        |            |            |                              |            |             |             |
| 1.                 | III | Core Theory-IX         | 6          | 4          | Social Psychology-I          | 25         | 75          | 100         |
| 2.                 | III | Core Theory-X          | 6          | 4          | Physiological Psychology     | 25         | 75          | 100         |
| 3.                 | III | Practical-I            | 6          | 4          | Psychological Assessment-I   | 40         | 60          | 100         |
| 4.                 | III | Elective –I            | 5          | 3          | Counselling and Guidance     | 25         | 75          | 100         |
| 5.                 | III | Elective-II/Case Study | 5          | 3          | Environmental Psychology     | 25         | 75          | 100         |
| 6.                 | IV  | SBS-III                | 2          | 2          | Cyber Psychology             | -          | 50          | 50          |
|                    |     |                        | <b>30</b>  | <b>20</b>  |                              | <b>165</b> | <b>485</b>  | <b>550</b>  |
| <b>Semester VI</b> |     |                        |            |            |                              |            |             |             |
| 1.                 | III | Core Theory-XI         | 6          | 4          | Social Psychology – II       | 25         | 75          | 100         |
| 2.                 | III | Core Theory-XII        | 6          | 4          | Neuro Psychology             | 25         | 75          | 100         |
| 3.                 | III | Practical-II           | 6          | 4          | Psychological Assessment- II | 40         | 60          | 100         |
| 4.                 | III | Elective –III          | 5          | 3          | Health Psychology            | 25         | 75          | 100         |
| 5.                 | III | Elective – IV/Project  | 5          | 3          | Psychology in HRM            | 25         | 75          | 100         |
| 6.                 | IV  | SBS-IV                 | 2          | 2          | Interpersonal Skills         | -          | 50          | 50          |
| 7.                 | V   | EA                     |            | 3          |                              |            | 100         | 100         |
|                    |     |                        | <b>30</b>  | <b>23</b>  |                              | <b>165</b> | <b>585</b>  | <b>650</b>  |
|                    |     |                        | <b>180</b> | <b>140</b> |                              | <b>855</b> | <b>2945</b> | <b>3600</b> |

Note: Extra 1-3 credit for Internship Training at the end of the 2<sup>nd</sup> Year and Extra 1 – 3 credit for project at last semester (optional).

### Consolidated statement

### B.Sc Psychology

| PART     | SUBJECT      | PAPERS   | HOURS     | CREDIT   | TOTAL CREDITS | MARKS    | TOTAL MARKS |        |
|----------|--------------|----------|-----------|----------|---------------|----------|-------------|--------|
| Semester | Subject Code | Category | Lecture   |          | Theory        |          | Practical   | Credit |
|          |              |          | Hrs/ Week | Hrs/ Sem | Hrs/ Week     | Hrs/ Sem |             |        |

|          |                         |    |                  |    |                    |     |             |
|----------|-------------------------|----|------------------|----|--------------------|-----|-------------|
| Part-I   | Language                | 04 | 24               | 04 | 16                 | 100 | 400         |
| Part-II  | English                 | 04 | 22               | 04 | 16                 | 100 | 400         |
| Part-III | Allied(Odd Semester)    | 02 | 12               | 05 | 10                 | 100 | 200         |
|          | Allied(Even Semester)   | 02 | 12               | 05 | 10                 | 100 | 200         |
|          | Electives               | 04 | 20               | 03 | 12                 | 100 | 400         |
|          | Core                    | 12 | 60               | 04 | 48                 | 100 | 1200        |
|          | Practical               | 02 | 12               | 04 | 08                 | 100 | 200         |
| Part-IV  | Environmental Studies   | 01 | 02               | 02 | 02                 | 100 | 100         |
|          | Soft skills             | 01 | 02               | 01 | 01                 | 50  | 50          |
|          | Value Education         | 01 | 02               | 02 | 02                 | 50  | 50          |
|          | Language and others/NME | 02 | 04               | 02 | 04                 | 50  | 100         |
|          | Skill based             | 04 | 08               | 02 | 08                 | 50  | 200         |
| Part-V   | Extension Activities    | 01 | -                | 03 | 03                 | 100 | 100         |
|          | <b>Total</b>            |    | <b>180 Hours</b> |    | <b>140 Credits</b> |     | <b>3600</b> |

### BASIC PSYCHOLOGY-I

|   |  |      |    |    |    |    |    |    |
|---|--|------|----|----|----|----|----|----|
| I |  | Core | 05 | 75 | 04 | 60 | 15 | 04 |
|---|--|------|----|----|----|----|----|----|

### **COURSE OBJECTIVE**

In this course students are exposed to the general and basic concepts of Psychology

### **COURSE OUTCOMES**

On successful completion of the course, students will be able to

| <b>CO Number</b> | <b>CO Statement</b>   | <b>Knowledge Level (K1-K4)</b> |
|------------------|---|--------------------------------|
| CO1              | Recall the history, scope of Psychology and the science behind.   | K1- Remember                   |
| CO2              | Identify sensation and the concept of perception  | K2-Understand                  |
| CO3              | Relate thinking process in reasoning, problem solving and decisions making. Understanding and producing language. | K3-Apply                       |
| CO4              | Compare the various theories of learning and apply it for learning process.                                       | K3-Apply                       |
| CO5              | Discover the process and types of memory and apply memory techniques to store the information effectively.        | K3-Apply                       |

### **MAPPING WITH PROGRAMME OUTCOMES**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| CO1        | S          | S          | M          | M          | M          | M          |
| CO2        | S          | S          | S          | S          | M          | M          |
| CO3        | S          | S          | S          | S          | S          | S          |
| CO4        | S          | S          | S          | S          | S          | S          |
| CO5        | S          | S          | S          | S          | S          | S          |

**S- Strong M-Medium L-Low**

### **UNIT-I**

**(15 HOURS)**

### **INTRODUCTION**

Definition of Psychology-Historical Origin of Psychology- Psychology as Science- Methods of Psychology-Schools of Psychology-Branches of Psychology- Scope of Psychology

## **UNIT-II**

**( 15 HOURS)**

### **ATTENTION, SENSATION AND PERCEPTION**

Attention: Definition -Characteristics of attention-Attention and the processing of information- Filter model. Sensation: Definition-Sensitivity-Signal detection theory-Sensory Coding.

Perception: Definition- Characteristics-Principles of organization- Constancies – Errors in perception.

## **UNIT-III**

**(15 HOURS)**

### **THINKING**

Thinking: Definition-Thinking process-Concepts-Problem Solving-Decision Making-Creative thinking-Stages in creative thinking-Nature in creative thinking- Language-Communication-Language elements-Meaning of concepts.

## **UNIT-IV**

**(15 HOURS)**

### **LEARNING**

Learning: Definition-Theories of learning-Associative learning: Classical conditioning- Operant Conditioning- Cognitive learning: Cognitive Maps-latent learning-Insight learning-Observational learning-Trial and error learning.

## **UNIT-V**

**(15 HOURS)**

### **MEMORY**

Memory: Definition-Theories of memory- Process of memory- Sensory memory- Working memory-Kinds of memory, Constructive memory-Forgetting- Memory building techniques.

**Practicum: Experiments to be done on any topics from the syllabus.**

#### **Practicum Activities:**

Activities and experiments related to

- attention,
- problem solving,

- learning and
- Memory.

**Distribution of Marks: Theory 100% and Problems 0%**

**TEXT BOOKS:**

| S.No | Authors   | Title  | Publishers      | Year Of Publication |
|------|---|--|-----------------|---------------------|
| 01   | Morgan, Clifford.T.,<br>Richard.A.King., Weisz.<br>R.John., John Schopler | Introduction to<br>Psychology,<br>7 <sup>th</sup> Edition                        | TataMcGraw Hill | 2001                |
| 02.  | Micheal W.Passer &<br>Ronald E.Smith                                      | Psychology<br>the science<br>of mind and<br>behavior, 3 <sup>rd</sup><br>Edition | TataMcGraw Hill | 2007                |

**REFERENCE BOOKS:**

| S.No | Authors   | Title  | Publishers                              | Year Of Publication |
|------|---|--|---|---------------------|
| 02   | Marx, Melvin.H                                  | Introduction to<br>Psychology-Problems,<br>Procedures and<br>principles. | MacMillan<br>Publishing Co              | 1976                |
| 03   | Hilgard.E.R.,<br>Atkinson.R.L.,<br>Atkinson.R.C | Introduction to<br>Psychology  | Harcourt<br>Brace<br>Jovanovich.In<br>c | 1979                |

**WEB SOURCES:**

- <http://www.psychologydiscussion.net/notes/psychology-notes/attention-and-perception/notes-on-perception-meaning-organization-and-factors-psychology/1975>
- <https://www.coursera.org/learn/introduction-psychology/>
- <https://www.apstudynotes.org/psychology/outlines/chapter-6-learning/>
- <https://www.simplypsychology.org/memory.html>
- <https://www.edx.org/learn/psychology>

**TEACHING METHODOLOGIES:**

- Discussion
- Buzz group formation
- Visual aids
- Assignment and Seminar

- Peer teaching.

**SYLLABUS DESIGNER:**

**Mrs.R.Safina Selva**

*Head and Assistant Professor of Psychology*

*DKM College for Women (Autonomous).*

**DEVELOPMENTAL PSYCHOLOGY-I**

| Semester | Subject Code | Category | Lecture   |          | Theory    |          | Practical | Credit |
|----------|--------------|----------|-----------|----------|-----------|----------|-----------|--------|
|          |              |          | Hrs/ Week | Hrs/ Sem | Hrs/ Week | Hrs/ Sem |           |        |
| I        |              | Core     | 05        | 75       | 04        | 60       | 15        | 04     |

**COURSE OBJECTIVE**

This course helps the students to gain knowledge about the developmental changes happen throughout life span in the body and mind of human being.

**COURSE OUTCOMES**

On successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | Discover the developments of prenatal period and its hazards.  | K1-Remember             |
| CO2       | Identify the characteristics, physical development, speech development, emotional and social development, personality development and the hazards of infancy and babyhood period | K2-Understand           |
| CO3       | Sketch out the characteristics, physical, physiological, social ,moral development and hazards during early childhood  | K3-Apply                |
| CO4       | Show the characteristics, emotional ,social skill, personality development ,happiness and hazards during late childhood  | K3-Apply                |
| CO5       | Illustrate the physical, psychological changes and hazards during the puberty and adolescence, also knowing about the happiness in adolescence.                                  | K3-Apply                |

**MAPPING WITH PROGRAMME OUTCOMES**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
|-----|-----|-----|-----|-----|-----|-----|

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | S | S | M | M | M | M |
| CO2 | S | S | S | S | M | M |
| CO3 | S | S | S | S | S | S |
| CO4 | S | S | S | S | S | S |
| CO5 | S | S | S | S | S | S |

**S- Strong M-Medium L-Low**

## **UNIT-I**

**(15 HOURS)**

### **PRE-NATAL PERIOD**

Human development- Havighurst's development tasks during the Life Span- Characteristics of the Prenatal Period- Conception and importance of Conception- Periods of Prenatal development-Attitude of Significant People-Hazards during the prenatal period.

## **UNIT-II**

**(15 HOURS)**

### **INFANCY AND BABYHOOD**

Characteristics of infancy-Major adjustment of infancy- Characteristics of infant – Hazards of infancy- Characteristics of babyhood- Physical development- Physiological functions-Muscle control- Speech development- Emotional behavior- Developments in socialization- Beginning of interest in play development of understanding- Beginning of modality- Sex role type- Family relationship- Personality development-Hazards in babyhood- Happiness in babyhood

## **UNIT- III**

**(15 HOURS)**

### **EARLY CHILDHOOD**

Characteristics of early childhood- Developmental tasks-Physical development- Physiological habits- Skills in early childhood- Improvement in speech- Emotions in early childhood- Socialization- Playing early childhood- Development of understanding-Moral development common interest- Sex role type- Family relations- Personality-Hazards in early childhood- Happiness in early childhood.

## **UNIT-IV**

**(15 HOURS)**

### **LATE CHILDHOOD**

Characteristics of late child-Physical development- Skills in late childhood-Improvement in speech-Emotions and emotional expressions- Social grouping and social behavior-Play interest and activities-Increase in understanding- Moral attitudes and behavior- Interest in late childhood-Sex role type- Changes in family relationship- Personality change- Hazards in late childhood- Happiness in late childhood.

**UNIT-V****(15 HOURS)****PUBERTY AND ADOLESCENCE**

Characteristics of puberty- Age of puberty- The puberty growth spurt- Body changes- Effects of puberty changes- Effects of deviant maturity- Source concern- Hazards of puberty- Unhappiness at puberty-Characteristics of adolescence- Developmental tasks- Physical changes-Emotionality-Social changes-Adolescent interest-Changes in modality-Approved sex role- Family relationships during personality changes- Hazards of adolescence- Happiness in adolescence.

**Practicum: Students have to carry out practical on any one developmental stages of life span based on the syllabus.**

**Distribution of Marks: Theory 100% and Problems 0%**

**TEXT BOOKS:**

| <b>S.No</b> | <b>Authors</b>                     | <b>Title</b>                              | <b>Publishers</b>             | <b>Year Of Publication</b> |
|-------------|------------------------------------|---|-------------------------------|----------------------------|
| 01          | Hurtlock.E                         | Developmental Psychology                  | TataMcGraw Hill               | 1980                       |
| 02.         | Papilia,Diane E.,Sally Wendos Olds | Human Development,9 <sup>th</sup> Edition | TataMcGraw Hill Publishing Co | 2005                       |

**REFERENCE BOOKS:**

| <b>S.No</b> | <b>Authors</b>   | <b>Title</b>                                   | <b>Publishers</b>              | <b>Year Of Publication</b> |
|-------------|------------------|--|--------------------------------|----------------------------|
| 02          | Shaffer,David. R | Development Psychology 4 <sup>th</sup> Edition | Brooks/Cole Publishing company | 1993                       |
| 03          | Smith,Barry D.   | Psychology Science and Understanding           | TataMcGraw Hill                | 1998                       |

**WEB SOURCES:**

- <https://www.coursera.org/learn/developmental-psychology>
- <https://www.edx.org/course/introduction-to-developmental-psychology-1>
- <https://www.cliffsnotes.com/study-guides/psychology/development-psychology>



- <https://www.sparknotes.com/psychology/psych101/development/section2/>
- <https://www.slideshare.net/mspambernardo/babyhood>

| Semester | Subject | Category | Lecture | Theory | Practical | Credit |
|----------|---------|----------|---------|--------|-----------|--------|
|----------|---------|----------|---------|--------|-----------|--------|

- <https://www.cliffsnotes.com/study-guides/psychology/development-psychology/physical-cognitive-development-age-12/physical-development-age-1219>

#### **TEACHING METHODOLOGIES:**

- Discussion
- Seminar
- Visual aids
- Role play
- Field visits

#### **SYLLABUS DESIGNER:**

**Mrs.R.Safina Selva**

*Head and Assistant Professor of Psychology*

*DKM College for Women (Autonomous).*

#### **RESEARCH AND STATISTICS IN PSYCHOLOGY**

|   | <b>Code</b> |      | Hrs/<br>Week | Hrs/<br>Sem | Hrs/<br>Week | Hrs/<br>Sem |    |    |
|---|-------------|------|--------------|-------------|--------------|-------------|----|----|
| I |             | Core | 06           | 90          | 05           | 75          | 15 | 05 |

### **COURSE OBJECTIVE**

This course gives an understanding of various statistical techniques in terms of their assumptions, interpretation and applications.

### **COURSE OUTCOMES**

On successful completion of the course, students will be able to

| <b>CO Number</b> | <b>CO Statement</b>  | <b>Knowledge Level (K1-K4)</b> |
|------------------|--|--------------------------------|
| CO1              | Recall the basics of research  | K1-Remember                    |
| CO2              | Discover the methods of data collection in order to make use of it during further studies. | K3- Apply                      |
| CO3              | Recall the functions, scope and limitations of statistics                                  | K1-Remember                    |
| CO4              | Do quantitative analysis and graphically represent the data.                               | K3- Apply                      |
| CO5              | Prepare normal curve and also to find correlation between two variables.                   | K3- Apply                      |

### **Mapping with Programme Outcomes**

| <b>COS</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> |
|------------|------------|------------|------------|------------|------------|------------|
| CO1        | S          | S          | M          | M          | M          | M          |
| CO2        | S          | S          | S          | S          | M          | M          |
| CO3        | S          | S          | S          | S          | S          | S          |
| CO4        | S          | S          | S          | S          | S          | S          |
| CO5        | S          | S          | S          | S          | S          | S          |

**S- Strong M-Medium L-Low**

### **UNIT-I**

**(15 HOURS)**

## **INTRODUCTION TO RESEARCH - (Theory)**

Meaning- Definition- Objectives-Types of research- Characteristics of research-Steps in research process- Criteria of good research-Research problem- techniques involved in defining a research problem.

### **UNIT-II**

**(15 HOURS)**

#### **SAMPLING - (Theory)**

Population and Sample- Types of sampling: Probability and non probability sample- Sources of data collection- Scales of measurement.

### **UNIT-III**

**(20 HOURS)**

#### **INTRODUCTION TO STATISTICS - (Theory)**

Meaning of statistics- Definition-Functions and limitations of statistics –Discrete and continuous variables- Descriptive and inferential statistics.

### **UNIT-IV – (Theory and practical sums)**

**(20 HOURS)**

#### **GRAPHICAL REPRESENTATIONS OF DATA AND QUANTITATIVE ANALYSIS**

*Grouped data:* Frequency graphs: Histograms, Frequency polygon, Frequency distribution- Cumulative frequency- *Ungrouped data:* Types of diagram: Bar diagram- types of bar diagram- Pie diagram- merits and demerits of diagrams.

*Quantitative Analysis:* Measures of central tendency: Mean-Median-Mode.

Measures of Variability: Range- Standard deviation.

### **UNIT-V– (Theory and practical sums)**

**(20 HOURS)**

#### **NORMAL CURVE (Theory) AND CORRELATION (Theory and Sums)**

The Normal Distribution- Properties of the Normal Curve- Importance of Normal Distribution-Application in NPC.

*Correlation:* Meaning and its types- Scatter diagram-Karl Pearson Coefficient of correlation- Spearman's rank correlation.

**Practicum: Students have to carry out a practical based on methods of data collection.**

#### **Practicum Activities:**

- Designing of questionnaire

- Data collection methods- interview, observation, questionnaire and other methods
- Data collection through Google forms.

**Distribution of Marks: Theory 75% and Problems 25%**

**TEXT BOOKS:**

| S.No | Authors                                       | Title  | Publishers                         | Year Of Publication |
|------|---|--|------------------------------------|---------------------|
| 01   | Arthur Aron, Elaine N. Aron, Elliot, J. Coups | Statistics for Psychology, 4 <sup>th</sup> edition                       | New Delhi: Pearson Education Inc   | 2006                |
| 02   | S.K. Mangal                                   | Statistics in Psychology and education, 2 <sup>nd</sup> edition          | New Delhi: Prentice-Hall of India. | 2002                |
| 03   | C.R. Kothari & Gaurav Garg                    | Research Methodology and methods and techniques, 3 <sup>rd</sup> edition | New Age International Publishers   | 2014                |

**REFERENCE BOOKS:**

| S.No | Authors                                     | Title  | Publishers                         | Year Of Publication |
|------|---|--|------------------------------------|---------------------|
| 01   | Gupta, S.P                                  | Statistical methods  | New Delhi: Sultan Chand and sons   | 2002                |
| 02   | Frederick, J. Gravetter & Larry, B. Wallman | Essentials of Statistics for the Behavioural sciences, 2 <sup>nd</sup> edition | New York : West Publishing company | 1993                |

**WEB SOURCES:**

- <https://www.udemy.com/introductory-statistics-part1-descriptive-statistics/>
- <https://www.edx.org/course/introduction-statistics-descriptive-uc-berkeleyx-stat2-1x>
- <https://www.udemy.com/statistics-for-psychology/>
- <https://sol.du.ac.in/mod/book/view.php?id=1317>
- <https://www.cliffsnotes.com/study-guides/statistics/sampling/populations-samples-parameters-and-statistics>
- <http://itfeature.com/statistics/primary-and-secondary-data-in-statistics>
- <https://econtutorials.com/blog/types-frequency-distribution/>

- <https://statistics.laerd.com/statistical-guides/measures-central-tendency-mean-mode-median.php>

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
|          |              |          | Hrs/Week | Hrs/Sem | Hrs/Week | Hrs/Sem |           |        |
| II       |              | Core     | 05       | 75      | 04       | 60      | 15        | 04     |

- <https://stattrek.com/descriptive-statistics/variability.aspx>
- <http://www.modares.ac.ir/uploads/Agr.Oth.Lib.17.pdf>

#### TEACHING METHODOLOGIES:

- Group test
- Assignments
- Model preparation
- Peer tutoring
- Seminar.

#### SYLLABUS DESIGNERS:

##### 01. Mrs.R.Safina Selva

*Head and Assistant Professor of Psychology*

##### 02.Ms.Aarthi.D

*Assistant Professor of Psychology*

#### BASIC PSYCHOLOGY-II

#### COURSE OBJECTIVE

In this course the students are exposed to the general and basic concepts of Psychology

#### COURSE OUTCOMES

On successful completion of the course, students will be able to

| CO | CO Statement | Knowledge Level |
|----|--------------|-----------------|
|----|--------------|-----------------|

| Number |  | (K1-K4)   |
|--------|--|-----------|
| CO1    | Demonstrate the theories of intelligence and carry out various tests for the measurement of the intelligence.                  | K3- Apply |
| CO2    | Discover the theories of motivation, types of motives and frustration and conflicts of motives associated with human behavior. | K3- Apply |
| CO3    | Relate the theories of emotions. Know about stress and apply effective coping techniques to overcome.                          | K3- Apply |
| CO4    | Use the theories of personality and conduct various tests to measure personality.  | K3- Apply |
| CO5    | Interpret and measure the level of consciousness. Sketch out the stages of sleep and sleep disorders.                          | K3- Apply |

### MAPPING WITH PROGRAMME OUTCOMES

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | S   | S   | S   | S   |
| CO2 | S   | S   | S   | S   | S   | S   |
| CO3 | S   | S   | S   | S   | S   | S   |
| CO4 | S   | S   | S   | S   | S   | S   |
| CO5 | S   | S   | S   | S   | S   | S   |

**S- Strong M-Medium L-Low**

### UNIT-I

**(15 HOURS)**

#### INTELLIGENCE

Definition- Theories of Intelligence: Two factor theory-Multifactor theory-Group factor theory- Guilford's model of intelligence- Triarchic theory- Theory of multiple intelligence- Measurement of intelligence- Testing for special aptitudes.

### UNIT-II

**(15 HOURS)**

#### MOTIVATION

Definition- Theories of motivation: Instinct theory- Drive theory- Arousal theory- Incentives theory- Need hierarchy theory- classification of motives- Biological motives, Psychological motives – Frustration and conflicts of motives.

### UNIT-III

**(15 HOURS)**

## EMOTIONS

Definition- Theories of emotions: James Lange theory-Cannon-Bard theory- Schacter-Singer Two factor theory- Lazarus's Cognitive- Appraisal theory- Stress: Nature of stress- Stress cycles (Hans Selye)-Effects of stress- Coping with stress.

### UNIT-IV

(15 HOURS)

## PERSONALITY

Determinants of Personality (Brief review) - Theories of personality: Type theories-early theories - Sheldon's theory- Eysenck's theory-Jung's theory- Trait theories: Allport -Cattells theory- Measurement of personality: Subjective methods- Objective methods- Projective techniques and tests.

### UNIT-V

(15 HOURS)

## CONSCIOUSNESS

Fundamental processes- Active and passive roles of consciousness- Biological rhythms- Waking state of consciousness- Sleep and dreams- Hypnosis-Sleep disorder- Stages of sleep.

**Practicum: Experiments to be done on any topics from the syllabus.**

### Practicum Activities:

Activities and experiments related to

- intelligence,
- motivation,
- emotions,
- personality and
- Consciousness.

**Distribution of Marks: Theory 100% and Problems 0%**

### TEXT BOOKS:

| S.No | Authors  | Title   | Publishers      | Year Of Publication |
|------|--|---|-----------------|---------------------|
| 01   | Morgan, Clifford.T.,<br>Richard.A.King.,Weisz.<br>R.John., John Schopler | Introduction to<br>Psychology,<br>7 <sup>th</sup> Edition | TataMcGraw Hill | 2001                |
| 02.  | Micheal W.Passer &   | Psychology  | TataMcGraw Hill | 2007                |

|  |                |  |  |  |
|--|----------------|--|--|--|
|  | Ronald E.Smith | the science of mind and behavior,3 <sup>rd</sup> Edition |  |  |
|--|----------------|--|--|--|

#### REFERENCE BOOKS:

| S.No | Authors   | Title   | Publishers                     | Year Of Publication |
|------|---|---|--------------------------------|---------------------|
| 02   | Marx,Melvin.H                                   | Introduction to Psychology-Problems, Procedures and principles. | MacMillan Publishing Co        | 1976                |
| 03   | Hilgard.E.R.,<br>Atkinson.R.L.,<br>Atkinson.R.C | Introduction to Psychology                                      | Harcourt Brace Jovanovich.In c | 1979                |

#### WEB SOURCES:

- <https://www.coursera.org/learn/introduction-psychology/>
- <https://www.edx.org/learn/psychology>
- <https://www.sparknotes.com/psychology/psych101/intelligence/section1/>
- <https://www.psychestudy.com/general/motivation-emotion/theories-motivation>
- <https://www.verywellmind.com/theories-of-emotion-2795717>
- <https://www.simplypsychology.org/personality-theories.html>
- <https://www.verywellmind.com/what-is-consciousness-2795922>

#### TEACHING METHODOLOGIES:

- Discussion
- Buzz group formation
- Visual aids
- Seminar
- Assignments

#### SYLLABUS DESIGNER:

**Mrs.R.Safina Selva**



| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
|          |              |          | Hrs/Week | Hrs/Sem | Hrs/Week | Hrs/Sem |           |        |
| II       |              | Core     | 05       | 75      | 04       | 60      | 15        | 04     |

DKM College for Women (Autonomous).

## DEVELOPMENTAL PSYCHOLOGY-II

### COURSE OBJECTIVE

This course helps the students to gain knowledge about the developmental changes throughout the life Span in the body and mind of human being.

### COURSE OUTCOMES

On successful completion of the course, students will be able to

| CO Number | CO Statement   | Knowledge Level (K1-K4) |
|-----------|--|-------------------------|
| CO1       | List the characteristics of early adulthood and its personal, social, vocational, marital adjustments and hazards. | K1-Remember             |
| CO2       | Describe the characteristics of middle age and its personal, social adjustments and hazards.                       | K2-Understand           |
| CO3       | Classify the vocational and family adjustments during middle age and its hazards                                   | K3-Apply                |
| CO4       | Show the characteristics of old age and the changes in their development, motor, mental abilities and its hazards. | K3-Apply                |
| CO5       | Sketch the family and vocational adjustments of old age, their living arrangements and its hazards.                | K3-Apply                |

### Mapping with Programme Outcomes

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| CO1 | S   | S   | M   | M   | M   | M   |
| CO2 | S   | S   | S   | M   | M   | M   |
| CO3 | S   | S   | S   | S   | S   | S   |
| CO4 | S   | S   | S   | S   | S   | S   |

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO5 | S | S | S | S | S | S |
|-----|---|---|---|---|---|---|

**S- Strong M-Medium L-Low**

## **UNIT-I**

**(15 HOURS)**

### **EARLY ADULTHOOD**

Characteristics of early adulthood- Developmental tasks- Changes in interest in adulthood- Social mobility- Sex role adjustment- Personal and social hazards of adulthood, intellectual development, vocational adjustment- Marital adjustment- Adjustment to parenthood- Adjustment to singlehood-Hazards of vocational and marital adjustment

## **UNIT-II**

**(15 HOURS)**

### **MIDDLE AGE: PERSONAL AND SOCIAL ADJUSTMENT**

Characteristics of middle age- Developmental tasks-Adjustment to physical changes- Adjustment to mental changes- Social adjustment- Personal and social hazards- Changes to interest.

## **UNIT-III**

**(15 HOURS)**

### **MIDDLE AGE: VOCATIONAL AND FAMILY ADJUSTMENT**

Vocational adjustment- Adjustment to changed family patterns- Marital hazards of middle age- Adjustments to singlehood-Adjustments to loss of a spouse- Adjustments to approaching old age- Vocational and marital hazards of middle age.

## **UNIT-IV**

**(15 HOURS)**

### **OLD AGE: PERSONAL AND SOCIAL ADJUSTMENT**

Characteristics of old age- Developmental tasks- Adjustment to Physical changes- Change in motor abilities in old age- Changes in mental abilities in old age- Change in interest- Hazards to personal and social adjustment in old age.

## **UNIT-V**

**(15 HOURS)**

### **OLD AGE: VOCATIONAL AND FAMILY ADJUSTMENT**

Vocational adjustment- Adjustment to retirement- Adjustment to change in family life in old age- Adjustment to singlehood-Vocational and family hazards of old age- Living arrangements for the elderly people.

**Practicum: Students have to carry out practical on any one developmental stages of life span based on the syllabus.**

**Distribution of Marks: Theory 100% and Problems 0%**

**TEXT BOOKS:**

| <b>S.No</b> | <b>Authors</b>                     | <b>Title</b>                              | <b>Publishers</b>             | <b>Year Of Publication</b> |
|-------------|------------------------------------|---|-------------------------------|----------------------------|
| 01          | Hurtlock.E                         | Developmental Psychology                  | TataMcGraw Hill               | 1980                       |
| 02.         | Papilia,Diane E.,Sally Wendos Olds | Human Development,9 <sup>th</sup> Edition | TataMcGraw Hill Publishing Co | 2005                       |

**REFERENCE BOOKS:**

| <b>S.No</b> | <b>Authors</b>   | <b>Title</b>                                   | <b>Publishers</b>              | <b>Year Of Publication</b> |
|-------------|------------------|--|--------------------------------|----------------------------|
| 02          | Shaffer,David. R | Development Psychology 4 <sup>th</sup> Edition | Brooks/Cole Publishing company | 1993                       |
| 03          | Smith,Barry D.   | Psychology Science and Understanding           | TataMcGraw Hill                | 1998                       |

**WEB SOURCES:**

- <https://www.coursera.org/learn/developmental-psychology>
- <https://www.edx.org/course/introduction-to-developmental-psychology-1>
- <https://www.cliffsnotes.com/study-guides/psychology/psychology/developmental-psychology-age-13-to-65/development-in-early--middle-adulthood>
- <https://www.cliffsnotes.com/study-guides/psychology/psychology/developmental-psychology-age-13-to-65/development-in-late-adulthood>

**TEACHING METHODOLOGIES:**

- Discussion and Seminar
- Visual aids
- Role play
- Field visits

**SYLLABUS DESIGNER:**

| Semester | Subject Code | Category | Lecture  |         | Theory   |         | Practical | Credit |
|----------|--------------|----------|----------|---------|----------|---------|-----------|--------|
|          |              |          | Hrs/Week | Hrs/Sem | Hrs/Week | Hrs/Sem |           |        |
| II       |              | Core     | 06       | 90      | 05       | 75      | 15        | 05     |

**Mrs.R.Safina Selva***Head and Assistant Professor of Psychology**DKM College for Women (Autonomous).***EDUCATIONAL PSYCHOLOGY****COURSE OBJECTIVE**

This course gives knowledge about psychology regard to education.

**COURSE OUTCOMES**

On successful completion of the course, students will be able to

| CO Number | CO Statement  | Knowledge Level (K1-K4) |
|-----------|---|-------------------------|
| CO1       | Remember the historical backgrounds and research works in educational psychology.                               | K1- Remember            |
| CO2       | Compare major theories related to education and various models of learning                                      | K2-Understand           |
| CO3       | Know about the exceptional learners, their characteristics and the methodologies to train them.                 | K3-Apply                |
| CO4       | Apply social constructivist approaches in teaching.   | K3-Apply                |
| CO5       | Understand the need for physical and positive environment for learning and applying it in classroom management. | K3-Apply                |

**MAPPING WITH PROGRAMME OUTCOMES**

| COS | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
|-----|-----|-----|-----|-----|-----|-----|

|     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| CO1 | S | M | S | M | M | M |
| CO2 | S | M | S | M | S | M |
| CO3 | S | M | S | S | S | S |
| CO4 | S | M | S | S | S | S |
| CO5 | S | M | S | M | S | S |

**S- Strong M-Medium L-Low**

## **UNIT- I**

**(15 HOURS)**

### **INTRODUCTION**

Educational Psychology: Definition-Historical background- Effective teacher: Professional knowledge and skills, Commitment and motivation- Research methods in educational psychology.

## **UNIT-II**

**(15 HOURS)**

### **MAJOR THEORIES AND MODELS OF LEARNING**

Contemporary theories: Bronfenbrenner ecological theory, Erikson's life span development theory- Constructivist theory (J.Bruner)- Behaviorism learning: Classical conditioning, Operant conditioning- Experiential learning (C.Rogers)-Cognitive learning (Piaget and Vygotsky).

## **UNIT-III**

**(20 HOURS)**

### **EXCEPTIONAL LEARNERS AND TEACHING STRATEGIES**

Children with disabilities: Learning disabilities, Attention Deficit Hyperactive Disorder, Mental Retardation, Physical disorder, Sensory disorder, Speech and language disorders, Autism Spectrum disorders, Emotional and behavioral disorder.

Gifted Children: Characteristics, educating gifted children

## **UNIT-IV**

**(20 HOURS)**

### **EFFECTIVE TEACHING PLAN AND TECHNOLOGY**

Planning and instruction: Instructional planning, timeframes, Teacher- Centered lesson planning and instruction, Learner- Centered lesson planning and instruction – Technology and education-Social constructivist approaches: Teacher and peers as joint contributors, structuring small group work.

## **UNIT-V**

**(20 HOURS)**

### **CLASSROOM MANAGEMENT AND ASSESSMENT**

Need of classroom management- Physical environment of the class room- Positive environment for learning- Good communicator- Dealing with problem behavior.

Assessment: Grading and reporting performance.

**Practicum: Application of psychological testing in education.**

**Distribution of Marks: Theory 100% and Problems 0%**

**TEXT BOOK:**

| S.No | Authors          | Title   | Publishers                 | Year Of Publication |
|------|------------------|---|----------------------------|---------------------|
| 01   | Santrock W. John | Educational Psychology, 2 <sup>nd</sup> Edition | Tata McGraw Hill, New York | 2004                |

**REFERENCE BOOKS:**

| S.No | Authors             | Title  | Publishers                    | Year Of Publication |
|------|---------------------|--|-------------------------------|---------------------|
| 01   | Charles. E. Skinner | Educational Psychology, 4 <sup>th</sup> Edition                | New Delhi: Prentice Hall Inc. | 1974                |
| 02   | Morries Son         | Psychological foundation of education, 2 <sup>nd</sup> Edition | Holt, Rinehart and Winston    | 1972                |

**WEB SOURCES:**

- <https://www.mooc-list.com/tags/educational-psychology>
- <https://www.slideshare.net/MashoriAyaz/contemporary-theories-in-educational-psychology>
- <https://www.slideshare.net/marielorabelle86/educational-psychology-teaching-exceptional-learners-by-marie-lorabelle-reboya>
- <https://www.slideshare.net/RabiaKazi/social-constructivist-approaches>
- [https://en.wikibooks.org/wiki/Contemporary Educational Psychology/Chapter 7: Classroom Management and the Learning Environment](https://en.wikibooks.org/wiki/Contemporary_Educational_Psychology/Chapter_7:_Classroom_Management_and_the_Learning_Environment)
- <https://courses.lumenlearning.com/educationalpsychology/chapter/major-theories-and-models-of-learning/>
- <https://www.britannica.com/science/pedagogy>
- <https://study.com/academy/topic/theories-of-educational-psychology.html>

**TEACHING METHODOLOGIES:**

- Discussion
- Seminar
- Visual aids
- Role play
- Field visits

**SYLLABUS DESIGNER:**

**Mrs.R.Safina Selva**

*Head and Assistant Professor of Psychology*

**ENVIRONMENTAL STUDIES**

| Sem | Subject code | Category | Lecture   |              | Theory    |              | Credit |
|-----|--------------|----------|-----------|--------------|-----------|--------------|--------|
|     |              |          | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| I   |              | EVS      | 30        | 2            | 30        | 2            | 2      |

**Course Objective:**

The Objective of this paper is to acquaint the students to know the importance of the environment and to stimulate each individual to prevent the Natural resources.

**UNIT - I The Multidisciplinary nature of environmental studies 2 Hours**

Definition, Scope and importance – Need for public awareness.

**UNIT - II Natural resources: Renewable and Non-renewable resources 7 Hours**

Natural resources and associated problems.

- m) Forest resources: Use and over – exploitation, deforestation, case studies, Timber extraction, mining, dams and their effects on forests and tribal people.
- n) Water resources: Use and over – utilization of surface and ground water, floods, drought, conflicts over water, dams – benefits and problems.
- o) Mineral resources: Use and exploitation, environmental effects of extraction and using mineral resources, case studies.
- p) Food resources: World food problems, changes, caused by agriculture and overgrazing, effects of modern agriculture, fertilizer – pesticide problems, water logging, salinity, case studies.

- q) Energy resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources. Case studies.
- r) 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- III Ecosystems 7 Hours**

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chain, food webs and ecological pyramids
- Introduction, types, characteristics features, structure and function of the following ecosystem:-
  - i) Forest ecosystem
  - j) Grassland ecosystem
  - k) Desert ecosystem
  - l) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

### **UNIT - IV Biodiversity and its conservation 7 Hours**

- Introduction – Definition: Genetics, species and ecosystem diversity.
- Biogeographical classification of India.
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as a mega – diversity
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, manwildlife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

### **UNIT - V Environmental pollution 7 Hours**



## Definition

- q) Causes, effects and control measures of
- r) Air pollution
- s) Water pollution
- t) Soil pollution
- u) Marine pollution
- v) Noise pollution
- w) Thermal pollution
- x) Nuclear hazards
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management: floods, earthquake, cyclone and landslides.

NB: Field visit is mandatory for Internal.

## VALUE EDUCATION

| Sem | Subject code | Category        | Lecture   |              | Theory    |              | Credit |
|-----|--------------|-----------------|-----------|--------------|-----------|--------------|--------|
|     |              |                 | Total Hrs | Hrs per week | Total Hrs | Hrs per week |        |
| II  |              | Value Education | 30        | 2            | 30        | 2            | 2      |

### Course Objective:

The main objective is to enable students to learn about moral values in life and the meaning of relationships, family and responsibility.

### UNIT - I INTRODUCTION TO VALUE EDUCATION

**8 Hours**

Value Education – Definition – Relevance to present day – Concept of Human Values – Self introspection – Self Esteem.

### UNIT - II FAMILY VALUES

**10 Hours**

Family values – Components, structure and responsibilities of family – Neutralization of anger – adjustability – Threats of family life – Status of women in family and society – Caring for needy and elderly – Time allotment for sharing ideas and concerns.

**UNIT - III ETHICAL VALUES****10 Hours**

Ethical values – Professional ethics – Mass media ethics – Advertising ethics – Influence of ethics on family life – Psychology of children and youth – Leadership qualities – Personality development.

**UNIT - IV SOCIAL VALUES****9 Hours**

Social values – Faith, service and secularism – Social sense and commitment – Students and Politics – Social awareness, Consumer awareness, Consumer rights and responsibilities – Redressal mechanisms.

**UNIT - V GLOBALISATION****8 Hours**

Effect of International affairs on values of life. Issue of Globalization – Modern Warfare – Terrorism, Environmental issues – Mutual respect of different cultures, religions and their beliefs.

**References:**

13. T. Anchukandam and J. Kuttianimathathil (Ed) Grow Free Live Free, KrisituJyothi Publications, Bangalore, (1995).
14. Mani Jacob (Ed) Resource Book for Value Education, Institute for Value Education, New Delhi, 2002.
15. DBNI, NCERT, SCERT, Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.
16. Daniel and Selvamony – Value Education Today, (Madras Charistian College, Tambaram and ALACHE, New Delhi, 1990).
17. S. Ignacimuthu – Values for life – Bette Yourself Books, Mumbai, 1991.
18. M.M.M.Mascaronhas Centre for Research Education Science an Training for Family Life Promotion – Family Life Education, Bangalore, 1993.

**WEBS; TES AND e – LEARNING SOURCES:**

- [www.rkmissiondhel.org.education.html/](http://www.rkmissiondhel.org.education.html/)

- [www.clallam.org/lifestyleeducation.html/](http://www.clallam.org/lifestyleeducation.html/)
- [www.sun.com/./edu/progrmws/star.html/](http://www.sun.com/./edu/progrmws/star.html/)
- [www.infoscouts.com](http://www.infoscouts.com)
- [www.secretofsucces.com](http://www.secretofsucces.com)
- [www.1millionpapers.com](http://www.1millionpapers.com)
- [http:// militaryfinance.umuc.edu/education/edu-network.html](http://militaryfinance.umuc.edu/education/edu-network.html)