# Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)
Approved by Government of Tamil Nadu & Accredited by NAAC with A++ Grade (3rd Cycle - 3.64 CGPA)
Dr. N.G.P. - Kalapatti Road, Coimbatore – 641 048, Tamil Nadu, India
Web : www.drngpasc.ac.in | Email : info@drngpasc.ac.in | Phone : +91-422-2369100


## REGULATIONS 2023-24 for Under Graduate Programme

## (Outcome Based Education model with Choice Based Credit System)

## Bachelor of Science in Computer Science with Data Analytics Degree

(For the students admitted during the academic year 2023-24 and onwards)

### Programme: B. Sc. (Computer Science with Data Analytics)

### Eligibility

Candidates for admission to the first year of the **Bachelor of Science (Computer Science with Data Analytics)** Degree Programme shall be required to have passed in the Higher Secondary Examinations conducted by the Government of Tamil Nadu in the relevant subjects or an Examination accepted as equivalent there to by the Academic Council. Subject to such other conditions as may be prescribed there to are permitted to appear and qualify with any one of the following subjects: Mathematics / Computer Science / Statistics / Business Mathematics and wherever the students have not studied Mathematics, the necessary Mathematics knowledge be imparted through Tutorial/ Bridge Course.

### Programme Educational Objectives

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. Demonstrate expertise to solve diverse range of problems in computer science.
2. Exhibit skills for employment in industries especially in the field of Data Analytics.
3. Practice professional ethics and remain socially responsible.
4. Involve in life-long learning by adapting contemporary technologies, tools and Methodologies.
5. Progress towards higher studies and entrepreneurship

## PROGRAMME OUTCOMES

On the successful completion of the program, the following are the expected outcomes.

| PO Number | PO Statement |
|---|---|
| PO1 | Ability to apply knowledge of Computer science and mathematics to identify problems and model solutions |
| PO2 | Ability to analyze large data sets in the context of real world problems and interpret results |
| PO3 | Ability to Design, Implement and Evaluate solutions for computing problems |
| PO4 | Ability to apply current techniques, skills and tools necessary for data analytics |
| PO5 | Ability to exhibit soft skills and understand professional and social responsibilities |

*Guidelines for Programmes offering Part I& Part II for Four Semesters*

| Part | Subjects | No. of Papers | Credit | Semester No. |
|---|---|---|---|---|
| I (12 Credits) | Tamil / Hindi / French/Malayalam | 4 | 4 x 3 = 12 | I to IV |
| II (12 Credits) | English | 4 | 4 x 3 = 12 | I to IV |
| III (108 Credits) | Core (Credits 4 ) | 11 | 11 x 4 = 44 | I to VI |
| | Core (Credits 3 ) | 2 | 2 x 3 = 6 | I to VI |
| | Core (Credits 5) (Embedded- Core ) | 2 | 2 x 5 = 10 | III to IV |
| | Core Project (Credits 4) | 1 | 1 x 4 = 4 | VI |
| | Core Practical (Credits 2 ) | 3 | 3 x 2 = 6 | I to VI |
| | Inter Departmental Course (IDC) | 4 | 4 x 4 = 16 | I to IV |
| | Discipline Specific Elective (DSE) | 3 | 3 x 4 =12 | V & VI |
| | Skill Enhancement Course(SEC) | 4 | 4 x 2 = 8 | III ,IV,V&VI |
| | Industrial Training | 1 | 1 x 2=2 | V |
| IV (8 Credits) | Environmental Studies(AECC) | 1 | 2 | I |
| | Basic Tamil/Advance Tamil/Human Rights, & Women's Rights (AECC) | 1 | 2 | II |
| | Innovation & IPR/ Innovation, IPR & Entrepreneurship (AECC) | 1 | 2 | VI |
| | Generic Elective(GE) | 1 | 1 x 2=2 | V |
| V (2 Credits) | NSS/NCC/YRC/RRC/Yoga/Sports | - | 2 | I - II |
| TOTAL CREDITS | | | 142 | |

CURRICULUM

B. Sc. Computer Science with Data Analytics

| Course Code | Course Category | Course Name | L | T | P | Exam (hours) | Max Marks | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | CIA | ESE | Total | |
| **First Semester** | | | | | | | | | | |
| **Part– I** | | | | | | | | | | |
| 231TL1A1TA | Language-I | Tamil–I | 4 | 1 | - | 3 | 25 | 75 | 100 | 3 |
| 231TL1A1HA | | Hindi-I | | | | | | | | |
| 231TL1A1MA | | Malayalam-I | | | | | | | | |
| 231TL1A1FA | | French –I | | | | | | | | |
| **Part– II** | | | | | | | | | | |
| 231EL1A1EA | Language-II | English -I | 4 | - | 1 | 3 | 25 | 75 | 100 | 3 |
| **Part– III** | | | | | | | | | | |
| 234AI1A1CA | Core - I | Problem Solving and Programming in C | 4 | 1 | - | 3 | 25 | 75 | 100 | 4 |
| 234DA1A1CP | Core Practical - I | C Programming | - | - | 4 | 3 | 40 | 60 | 100 | 2 |
| 234IT1A1CA | Core -II | Digital Computer Fundamentals | 4 | - | - | 3 | 25 | 75 | 100 | 4 |
| 232MT1A1ID | IDC -I | Mathematics for Computing-I | 4 | 1 | - | 3 | 25 | 75 | 100 | 4 |
| **Part-IV** | | | | | | | | | | |
| 233MB1A1AA | AECC-I | Environmental Studies | 2 | - | - | - | 50 | - | 50 | 2 |
| **Part-V** | | | | | | | | | | |
| **234DA1A1XA** | Extension Activity | NSS/NCC/ YRC/RRC/ Yoga/Sports | - | - | - | - | 50 | - | 50 | 1 |
| **Total** | | | **22** | **03** | **05** | - | - | - | **700** | **23** |

9/6/23

BoS Chairman/HoD
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| Course Code | Course Category | Course Name | L | T | P | Exam (h) | Max Marks | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | CIA | ESE | Total | |
| **Second Semester** | | | | | | | | | | |
| **Part-I** | | | | | | | | | | |
| 231TL1A2TA | Language-I | Tamil–II | 4 | 1 | - | 3 | 25 | 75 | 100 | 3 |
| 231TL1A2HA | | Hindi-II | | | | | | | | |
| 231TL1A2MA | | Malayalam-II | | | | | | | | |
| 231TL1A2FA | | French –II | | | | | | | | |
| **Part– II** | | | | | | | | | | |
| 231EL1A2EA | Language-II | English -II | 4 | - | 1 | 3 | 25 | 75 | 100 | 3 |
| Part– III | | | | | | | | | | |
| 234CA1A2CA | Core -III | Data Structures | 4 | 1 | - | 3 | 25 | 75 | 100 | 4 |
| 234CS1A2CA | Core -IV | Object Oriented Programming with C++ | 4 | - | - | 3 | 25 | 75 | 100 | 4 |
| 234DA1A2CP | Core Practical-II | Data Structures and C++ | - | - | 4 | 3 | 40 | 60 | 100 | 2 |
| 232MT1A2ID | IDC -II | Mathematics for Computing-II | 4 | 1 | - | 3 | 25 | 75 | 100 | 4 |
| Part-IV | | | | | | | | | | |
| 231TL1A2AA | AECC-II | Basic Tamil/ Advance Tamil/Human Rights and Women's Rights | 2 | - | - | - | 50 | - | 50 | 2 |
| 231TL1A2AB | | | | | | | | | | |
| 235CR1A2AA | | | | | | | | | | |
| Part-V | | | | | | | | | | |
| 234DA1A2XA | Extension Activity | NSS/NCC/ YRC/RRC/ Yoga/Sports | - | - | - | - | 50 | - | 50 | 1 |
| | | **Total** | **22** | **03** | **05** | - | - | - | **700** | **23** |

16.10.23
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| Course Code | Course Category | Course Name | L | T | P | Exam (h) | Max Marks | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | CIA | ESE | Total | |
| **Third Semester** | | | | | | | | | | |
| **Part – I** | | | | | | | | | | |
| 231TL1A3TA | Language-I | Tamil–III | 3 | 1 | - | 3 | 25 | 75 | 100 | 3 |
| 231TL1A3HA | | Hindi-III | | | | | | | | |
| 231TL1A3MA | | Malayalam-III | | | | | | | | |
| 231TL1A3FA | | French –III | | | | | | | | |
| **Part – II** | | | | | | | | | | |
| 231EL1A3EA | Language-II | English -III | 3 | 1 | - | 3 | 25 | 75 | 100 | 3 |
| **Part – III** | | | | | | | | | | |
| 234DA1A3CA | Core-V | Database System Concepts | 4 | - | - | 3 | 25 | 75 | 100 | 4 |
| 234CS1A3CA | Core -VI | Operating Systems | 3 | - | - | 3 | 25 | 75 | 100 | 3 |
| 234AI1A3EP | Core Practical-III | Programming in Java | 3 | - | 4 | 3 | 40 | 60 | 100 | 5 |
| 234DA1A3SP | SEC Practical-I | Database Systems | - | - | 4 | 3 | 40 | 60 | 100 | 2 |
| 232MT1A3ID | IDC -III | Discrete Mathematics | 4 | - | - | 3 | 25 | 75 | 100 | 4 |
| Total | | | **20** | **02** | **08** | - | - | - | **700** | **24** |

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| Course Code | Course Category | Course Name | L | T | P | Exam (h) | Max Marks | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | CIA | ESE | Total | |
| **Fourth Semester** | | | | | | | | | | |
| **Part – I** | | | | | | | | | | |
| 231TL1A4TA | Language-I | Tamil–IV | 3 | 1 | - | 3 | 25 | 75 | 100 | 3 |
| 231TL1A4HA | | Hindi-IV | | | | | | | | |
| 231TL1A4MA | | Malayalam-IV | | | | | | | | |
| 231TL1A4FA | | French –IV | | | | | | | | |
| **Part – II** | | | | | | | | | | |
| 231EL1A4EA | Language-II | English -IV | 3 | 1 | - | 3 | 25 | 75 | 100 | 3 |
| **Part – III** | | | | | | | | | | |
| 234AI1A4CA | Core -VII | Foundations of Artificial Intelligence | 4 | - | - | 3 | 25 | 75 | 100 | 4 |
| 234IT1A4CA | Core VIII | Software Engineering | 3 | - | - | 3 | 25 | 75 | 100 | 3 |
| 234DA1A4EP | Core Practical-IV | Python for Data Science | 3 | - | 4 | 3 | 40 | 60 | 100 | 5 |
| 234DA1A4SP | SEC Practical-II | Data Mining | - | - | 4 | 3 | 40 | 60 | 100 | 2 |
| 235CO1A4IA | IDC - IV | Customer Relationship Management | 4 | - | - | 3 | 25 | 75 | 100 | 4 |
| Total | | | **20** | **02** | **08** | - | - | - | **700** | **24** |

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| Course Code | Course Category | Course Name | L | T | P | Exam (h) | Max Marks | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | CIA | ESE | Total | |
| **Fifth Semester** | | | | | | | | | | |
| **Part – III** | | | | | | | | | | |
| 234CT1A5CA | Core – IX | Computer Networks | 4 | 1 | - | 3 | 25 | 75 | 100 | 4 |
| 234DA1A5CA | Core – X | R Programming | 4 | 1 | - | 3 | 25 | 75 | 100 | 4 |
| 234DA1A5CB | Core - XI | Big Data Technologies | 4 | 1 | - | 3 | 25 | 75 | 100 | 4 |
| 234DA1A5CP | Core Practical - V | Big Data Technologies | - | - | 4 | 3 | 40 | 60 | 100 | 2 |
| 234DA1A5SP | SEC - III | Web Designing | - | - | 4 | 3 | 40 | 60 | 100 | 2 |
| 234DA1A5DA | DSE-I | Cloud Computing | 4 | 1 | - | 3 | 25 | 75 | 100 | 4 |
| 234DA1A5DB | | Web Analytics | | | | | | | | |
| 234DA1A5DC | | Text Analytics | | | | | | | | |
| 234DA1A5TA | IT | Industrial Training | - | - | - | 3 | 40 | 60 | 100 | 2 |
| **Part–IV** | | | | | | | | | | |
| | GE | | 2 | - | - | - | 50 | - | 50 | 2 |
| Total | | | **18** | **04** | **08** | - | - | - | **750** | **24** |

| Course Code | Course Category | Course Name | L | T | P | Exam (h) | Max Marks | | | Credits |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | CIA | ESE | Total | |
| **Sixth Semester** | | | | | | | | | | |
| **Part – III** | | | | | | | | | | |
| 234DA1A6CA | Core -XII | Next Generation Databases | 4 | - | - | 3 | 25 | 75 | 100 | 4 |
| 234DA1A6CB | Core -XIII | Artificial Intelligence | 4 | - | - | 3 | 25 | 75 | 100 | 4 |
| 234DA1A6SP | SEC -IV | Data Visualization | - | - | 4 | 3 | 40 | 60 | 100 | 2 |
| 234DA1A6CV | Core – XIV | Project Work | - | - | 8 | 3 | 40 | 60 | 100 | 4 |
| 234DA1A6DA | DSE –II | Data Security and Privacy | 4 | - | - | 3 | 25 | 75 | 100 | 4 |
| 234DA1A6DB | | Social Media Analytics | | | | | | | | |
| 234DA1A6DC | | Healthcare Analytics | | | | | | | | |
| 234DA1A6DD | DSE –III | Internet of Things | 4 | - | - | 3 | 25 | 75 | 100 | 4 |
| 234DA1A6DE | | Human Computer Interaction | | | | | | | | |
| 234DA1A6DF | | Ethics for Data Science | | | | | | | | |
| **Part – IV** | | | | | | | | | | |
| 233BC1A6AA | AECC-III | Innovation, IPR and Entrepreneurship | 2 | - | - | - | 50 | - | 50 | 2 |
| Total | | | **18** | - | **12** | - | - | - | **650** | **24** |
| ***Grand total** | | | | | | | | | **4200** | **142** |

## DISCIPLINE SPECIFIC ELECTIVE

Students shall select the desired course of their choice in the listed elective course during Semesters V & VI

**Semester V (Elective I)**
**List of Elective Courses**

| S. No. | Course Code | Name of the Course |
|---|---|---|
| 1 | 234DA1A5DA | Cloud Computing |
| 2 | 234DA1A5DB | Web Analytics |
| 3 | 234DA1A5DC | Text Analytics |

**Semester VI (Elective II)**
**List of Elective Courses**

| S. No. | Course Code | Name of the Course |
|---|---|---|
| 1 | 234DA1A6DA | Data Security and Privacy |
| 2 | 234DA1A6DB | Social Media Analytics |
| 3 | 234DA1A6DC | Healthcare Analytics |

**Semester VI (Elective III)**
**List of Elective Courses**

| S. No. | Course Code | Name of the Course |
|---|---|---|
| 1 | 234DA1A6DD | Internet of Things |
| 2 | 234DA1A6DE | Human Computer Interaction |
| 3 | 234DA1A6DF | Ethics for Data Science |

## GENERIC ELECTIVE COURSES (GE)

The following are the courses offered under Generic Elective Course

**Semester V**

| S. No. | Course Code | Name of the Course |
|---|---|---|
| 1 | 234DA1A5GA | Introduction to Data Analytics |

## EXTRA CREDIT COURSES

The following are the courses offered under self-study to earn extra credits:

**Semester III**

| S. No. | Course Code | Name of the Course |
|---|---|---|
| 1 | 234DA1ASSA | Decision Support Systems |
| 2 | 234DA1ASSB | Software Testing |

# UG - REGULATION (R5)

(2023-24 and onwards)

(OUTCOME BASED EDUCATION WITH CBCS)

## 1.NOMENCLATURE

**1.1 Faculty**: Refers to a group of programmes concerned with a major division of knowledge Eg. Faculty of Computer Science consists of disciplines like Departments of Computer Science, Information Technology, Computer Technology, Computer Applications, Data Analytics, Cognitive Systems, Artificial Intelligence and Machine Learning and Cyber Security

**1.2 Programme**: Refers to the Bachelor of Science / Commerce /Arts stream that a student has chosen for study.

**1.3 Batch**: Refers to the starting and completion year of a programme of study. Eg. Batch of 2023–26 refers to students belonging to a 3 year Degree programme admitted in 2023 and completing in 2026.

**1.4 Course**: Refers to component of a programme. A course may be designed to involve lectures / tutorials / laboratory work / seminar / project work/ practical training / report writing / Viva- voce, etc., or a combination of these, to meet effectively the teaching learning needs.

a) **Core Course:**A course, which should compulsorily be studied by a candidate as a core requirement

b) **Inter Disciplinary Course (IDC):** A course chosen generally from a related discipline/subject with an intention to seek exposure in the discipline relating to the core domain of the student

c) **Discipline Specific Elective (DSE) Course**: Elective courses offered under main discipline/ subject of study.

d) **Skill Enhancement Courses (SEC):** Value-based and/or skill-based courses which are aimed at providing hands-on-training, competencies, skills, etc.

e) **Ability Enhancement Compulsory Courses (AECC):**Mandatory courses that lead to Knowledge enhancement. Environmental Science, Human Rights and Women's Rights, Basic Tamil/ Advanced Tamil, Innovation and IPR, Innovation, IPR and Entrepreneurship.

f) **Ability Enhancement Elective Course (AEEC)/Generic Elective (GE)** An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is Generic Elective.

### 1.5 Project Work:

Course involving application of knowledge in problem solving / analyzing /exploring a real life situation / difficult problem. The Project work will be given in lieu of a Core paper.

**Internship/Industrial Training**

Students must undertake industrial / institutional training for a minimum of 15 days during the IV semester summer vacation. The students will submit the report for evaluation during V semester.

### 1.6 Extra Credits:

Extra credits shall be awarded for achievements in identified curricular/co-curricular/Extracurricular activities executed outside the regular class hours. Extra credits are not mandatory for completing the programme.

## 2. STRUCTURE OF PROGRAMME

### 2.1 PART- I: LANGUAGE- I

Tamil or any one of the languages namely Malayalam, Hindi and French will be offered under Part – I in the first four semesters.

### 2.2 PART- II: LANGUAGE- II

English will be offered during the first four semesters.

### 2.3 PART- III:

- Core Course
- Inter Departmental Course (IDC)
- Discipline Specific Elective (DSE)
- Skill Enhancement Course (SEC)
- Industrial Training (IT)

### 2.4 PART- IV:

#### 2.4.1 Ability Enhancement Compulsory Course (AECC):

The Ability Enhancement Compulsory Courses such as i)Environmental Studies, ii) Human Rights and Womens' Rights, iii) Innovation and IPR/ Innovation, IPR and Entrepreneurship are offered during I,II and VI Semester.

Basic Tamil

a) Those who have not studied Tamil up to XII Std and taken a non-Tamil language under Part-I shall take oneBasic Tamil coursein the second semester.

(OR)

Advanced Tamil

b) Those who have studied Tamil up to XII Std and taken a non-Tamil language under Part-I shall take one Advanced Tamil course in the second semester.

**Note:** Students who come under the above a+b categories are exempted from Human Rights and Women's Rights in the second semester.

**Ability Enhancement Elective Course (AEEC)/Generic Elective (GE)** An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is Generic Elective offered in V semester. (Theory/Practical/Non-Lab Practical)

## 2.5 PART- V: EXTENSION ACTIVITIES

The following extracurricular activities like NSS/YRC/NCC/RRC/Yoga/Sports/Clubs are offered under extension activities during semester I & II. Students will be evaluated based on their active participation in any one of the above activities. 75% Attendance is compulsory for extension activity.

## 3. CREDIT ALLOTTMENT

The following is the credit allotment:

- Lecture Hours (Theory) : 1 credit per lecture hour per week
- Laboratory Hours : 1 credit for 2 Practical hours per week
- Project Work : 1 credit for 2 hours of project work per week

## 4. DURATION OF THE PROGRAMME

The B.A. /B.Com./B. Sc. Programme must be completed within 3 years (6 semesters) and a maximum of 6 years (12 semesters) from the date of acceptance to the programme. If not, the candidate must enroll in the course determined to be an equivalent by BoS in the most recent curriculum recommended for the Programme.

## 5.REQUIREMENTS FOR COMPLETION OF A SEMESTER

Every student shall ordinarily be allowed to keep terms for the given semester in a program of his/ her enrolment, only if he/ she fulfills at least seventy five percent (75%) of the attendance taken as an average of the total number of lectures, practicals, tutorials, etc. wherein short and/or long excursions/field visits/study tours organised by the college and supervised by the faculty as envisaged in the syllabus shall be credited to his/her attendance. Every student shall have a minimum of 75% as an overall attendance.

## 6. EXAMINATIONS

The end semester examinations shall normally be conducted after completing 90 working days for each semester. The maximum marks for each theory and practical course shall be 100 with the following breakup:

**a) Mark distribution for Theory Courses**

| | |
|---|---|
| Continuous Internal Assessment (CIA) | : 25 Marks |
| End Semester Exams (ESE) | : 75 Marks |
| Total | : 100 Marks |

**i) Distribution of Internal Marks**

| S.No. | Particulars | Distribution of Marks |
|---|---|---|
| 1 | CIA I (2.5 Units) (On completion of 45th working day) | 5 |
| 2 | Model ( All 5 Units) (On completion of 85th working day) | 5 |
| 3 | Attendance | 5 |
| 4 | Library Usage | 5 |
| 5 | Skill Enhancement * | 5 |
| | Total | 25 |

**Breakup for Attendance Marks:**

| S.No | Attendance Range | Marks Awarded |
|---|---|---|
| 1 | 95% and Above | 5 |
| 2 | 90% - 94% | 4 |
| 3 | 85% - 89% | 3 |
| 4 | 80% - 84% | 2 |
| 5 | 75% - 79% | 1 |

**Note:**

Special Cases such as NCC, NSS, Sports, Advanced Learner Course, Summer Fellowship and Medical Conditions etc. the attendance exemption may be given by principal and Mark may be awarded.

**Break up for Library Marks:**

| S.No | Attendance Range | Marks Awarded |
|---|---|---|
| 1 | 10h and above | 5 |
| 2 | 9h- less than 10h | 4 |
| 3 | 8h - less than 9h | 3 |
| 4 | 7h - less than 8h | 2 |
| 5 | 6h - less than 7h | 1 |

**Note:**
In exception, the utilization of e-resources of library will be considered.

***Components for "Skill Enhancement" may include the following:**

Class Participation, Case Studies Presentation/term paper, Field Study, Field Survey, Group Discussion, Term Paper, Presentation of Papers in Conferences, Industry Visit, Book Review, Journal Review, e-content Creation, Model Preparation, Seminar and assignment.

**Components for Skill Enhancement**

Any one of the following should be selected by the course coordinator

| S.No. | Skill Enhancement | Description |
|---|---|---|
| 1 | Class Participation | • Engagement in class<br>• Listening Skills<br>• Behaviour |
| 2 | Case Study Presentation/ Term Paper | • Identification of the problem<br>• Case Analysis<br>• Effective Solution using creativity/imagination |
| 3 | Field Study | • Selection of Topic<br>• Demonstration of Topic<br>• Analysis & Conclusion |
| 4 | Field Survey | • Chosen Problem<br>• Design and quality of survey<br>• Analysis of survey |
| 5 | Group Discussion | • Communication skills<br>• Subject knowledge<br>• Attitude and way of presentation<br>• Confidence<br>• Listening Skill |
| 6 | Presentation of Papers in Conferences | • Sponsored<br>• International/National<br>• Presentation<br>• Report Submission |
| 7 | Industry Visit | • Chosen Domain<br>• Quality of the work |

| | | |
|---|---|---|
| | | • Analysis of the Report<br>• Presentation |
| 8 | Book Review | • Content<br>• Interpretation and Inferences of the text<br>• Supporting Details<br>• Presentation |
| 9 | Journal Review | • Analytical Thinking<br>• Interpretation and Inferences<br>• Exploring the perception if chosen genre<br>• Presentation |
| 10 | e-content Creation | • Logo/ Tagline<br>• Purpose<br>• Content (Writing, designing and posting in Social Media)<br>• Presentation |
| 11 | Model Preparation | • Theme/ Topic<br>• Depth of background Knowledge<br>• Creativity<br>• Presentation |
| 12 | Seminar | • Knowledge and Content<br>• Organization<br>• Understanding<br>• Presentation |
| 13 | Assignment | • Content and Style<br>• Spelling and Grammar<br>• References |

**ii) Distribution of External Marks (ESE)**

| | | |
|---|---|---|
| **Total** | : | 75 |
| **Written Exam** | : | 75 |

**Marks Distribution for Practical course**

| | | |
|---|---|---|
| **Total** | : | 100 |
| **Internal** | : | 40 |
| **External** | : | 60 |

i) Distribution of Internals Marks

| S.No. | Particulars | Distribution of Marks |
|---|---|---|
| 1 | Experiments/Exercises | 15 |
| 2 | Test 1 | 10 |
| 3 | Test 2 | 10 |
| 4 | Observation Notebook | 05 |
| | Total | 40 |

ii) Distribution of Externals Marks

| S.No. | Particulars | External Marks |
|---|---|---|
| 1 | Practical | 40 |
| 2 | Record | 10 |
| 3 | Viva- voce | 10 |
| | Total | 60 |

Practical examination shall be evaluated jointly by Internal and External Examiners

**Mark Distribution for Project/ Internship/ Industrial Training**

| | | |
|---|---|---|
| Total | : | 100 |
| Internal | : | 40 |
| External | : | 60 |

i) Distribution of Internal Marks

| S.No. | Particulars | Internal Marks |
|---|---|---|
| 1 | Review I | 15 |
| 2 | Review II | 20 |
| 3 | Attendance | 5 |
| | Total | 40 |

ii) Distribution of External Marks

| S.No | Particulars | External Marks |
|---|---|---|
| 1 | Project Work /Internship /Industrial training Presentation | 40 |
| 2 | Viva –voce | 20 |
| | Total | 60 |

Evaluation of Project Work/Internship/ Industrial training shall be shall be done jointly by Internal and External Examiners.

7. Credit Transfer

a. Upon successful completion of **1 NPTEL** Course **(4 Credit Course)** recommended by the department, during Semester I to IV, a student shall be eligible to get exemption of one **4 credit course** during the V or VI semester. The proposed NPTEL course should cover content/syllabus of exempted core paper in V orVI semester.

| S. No. | Course Code | Course Name | Proposed NPTEL Course | Credit |
|---|---|---|---|---|
| 1 | | | Option – 1 Paper title | 4 |
| | | | Option – 2 Paper title | |
| | | | Option – 3 Paper title | |

b. Upon successful completion of **2 NPTEL Courses** (2 Credit each) recommended by the department, during Semester I to IV, a student shall be eligible to get exemption of **one 4 credit course** during the V or VI semester. Out of 2 NPTEL proposed courses, **atleast 1 course** should cover content/syllabus of exempted core paper in V orVI semester.

Mandatory

**The exempted core paper in the V or VI semester should be submitted by the students for approval before the end of 4th semester**

**Credit transfer will be decided by equivalence committee**

| S. No. | Course Code | Course Name | Proposed NPTEL Course | Credit |
|---|---|---|---|---|
| 1 | | | Option – 1 Paper title | 2 |
| | | | Option – 2 Paper title | |
| | | | Option – 3 Paper title | |
| 2 | | | Option – 1 Paper title | 2 |
| | | | Option – 2 Paper title | |
| | | | Option – 3 Paper title | |

NPTEL Courses to be carried out during semester I – IV.

| S.No. | Student Name | Class | Proposed NPTEL Course | | Proposed Course for Exemption |
|---|---|---|---|---|---|
| | | | Course I | Option 1- Paper Title<br>Option 2- Paper Title<br>Option 3- Paper Title | Any one Core Paper in V or VI semester |
| | | | Course II | Option 1- Paper Title<br>Option 2- Paper Title<br>Option 3- Paper Title | |

## 8. Innovations

Upon Successful outcome of Design Thinking / Copy right/Product/ Patent by the end of the V Semester, student shall be eligible to get exemption in AECC: Innovation, IPR & Entrepreneurship / Innovation & IPR offered during VI Semester.

## 9.Internship/Industrial Training

Students must undertake industrial / institutional training for a minimum of 15 days during the IV semester summer vacation. The students shall submit the report for evaluation during V semester.

## 10. Extra Credits: 10

Earning extra credit is not essential for programme completion. Student is entitled to earn extra credit for achievement in Curricular /Co-Curricular/ Extracurricular activities carried out other than the regular class hours.

A student is permitted to earn a maximum of Ten extra Credits during the programme period.

**A maximum of 1 credit under each category is permissible.**

| Category | Credit |
|---|---|
| Proficiency in foreign language | 1 |
| Proficiency in Hindi | 1 |
| Self study Course | 1 |
| Typewriting/Short hand | 1 |
| CA/ICSI/CMA (Foundations) | 1 |
| CA/ICSI/CMA(Inter) | 1 |
| Sports and Games | 1 |
| Publications / Conference Presentations (Oral/Poster) | 1 |
| Lab on Project | 1 |
| Innovation / Incubation / Patent / Sponsored Projects / Consultancy | 1 |
| Representation in State / National level celebrations | 1 |
| Awards/Recognitions/Fellowships | 1 |

Credit shall be awarded for achievements of the student during **the period of study only**.

GUIDELINES

**Proficiency in foreign language**

A pass in any foreign language in the examination conducted by an authorized agency.

**Proficiency in Hindi**

A pass in the Hindi examination conducted by Dakshin Bharat Hindi Prachar Sabha.

Examination passed during the programme period only will be considered for extra credit.

**Self study Course**

A pass in the self study courses offered by the department.

The candidate should register the self study course offered by the department only in the III semester.

**Typewriting/Short hand**

A Pass in short hand /typewriting examination conducted by Tamil Nadu Department of Technical Education (TNDTE) and the credit will be awarded.

**CA/ICSI/CMA(Foundations)**

Qualifying foundation in CA/ICSI/CMA / etc.

**CA/ICSI/CMA(Inter)**

Qualifying Inter in CA/ICSI/CMA / etc.

**Sports and Games**

Students can earn extra credit based on their achievements in sports in University/ State / National/ International levels.

**Publications / Conference Presentations (Oral/Poster)**

Research Publications in Journals
oral/poster presentation in Conference

**Lab on Project (LoP)**

To promote the undergraduate research among all the students, the LoP is introduced beyond their regular class hours. LoP is introduced as group project consisting of not more than five members. It consist of four stages namely Literature collection, Identification of Research area, Execution of research and Reporting / Publication of research reports/ product developments. These four stages spread over from III to IV semester.

**(Evaluation will be done internally)**

**Innovation / Incubation / Patent / Sponsored Projects / Consultancy**

Development of model/ Products /Prototype /Process/App/Registration of Patents/ Copyrights/Trademarks/Sponsored Projects /Consultancy

**Representation in State/ National level celebrations**

State / National level celebrations such as Independence day, Republic day Parade, National Integration camp.

**Awards/Recognitions/Fellowships**

Regional/ State / National level awards/ Recognitions/Fellowships

GUIDELINES

100 % CIA Courses:

- AECC
- AEEC

| S.No | Type of Course |
|---|---|
| 1 | Environmental Studies (AECC) |
| 2 | Human Rights and Women's Rights, Basic Tamil /Advanced Tamil (AECC) |
| 3 | Innovation &IPR/ Innovation, IPR and Entrepreneurship(AECC) |
| 4 | Generic Elective (AEEC) |

**Modalities for Implementing Internal Assessment Marks:**

- Student pertaining to 2023 Batch (2023-26) UG programme for the above mentioned courses shall secure a minimum of 40% out of the maximum marks in the continuous internal assessment (CIA) i.e., 20 marks out of 50 marks.
- Students who have not acquired the minimum marks shall be allowed to reappear to improve their marks in the exam components only within the time duration of the programme, in the forthcoming semesters.

**Distribution of Internal Marks for AECC & AEEC**

| S.No. | Particulars | Distribution of Marks |
|---|---|---|
| 1 | CIA I (2.5 Units) (On completion of 45th working day) | 15 |
| 2 | Model ( All 5 Units) (On completion of 85th working day) | 15 |
| 3 | Assignment | 05 |
| 4 | Attendance | 05 |
| 5 | Library Usage | 05 |
| 6 | Skill Enhancement * | 05 |
| | **Total** | **50** |

Distribution of Internal Marks for Generic Elective (AEEC) (Practical)

| S.No. | Particulars | Distribution of Marks |
|---|---|---|
| 1 | CIA -I (1-5 Exercise) | 5 |
| 2 | CIA-II (6-10 Exercise) | 5 |
| 3 | Class Participation | 10 |
| 4 | Practical Record | 10 |
| 5 | Test-III & Viva –Voce(10+10) | 20 |
| | Total | 50 |

Question paper pattern AECC & AEEC

| Test | MARKS | DESCRIPTION | TOTAL | Remarks |
|---|---|---|---|---|
| CIA Test I<br>1 Hour<br>First 2.5 Units | 50 x 1 = 50 Marks | MCQ | 50 Marks | Marks secured will be Converted to 15 marks |
| CIA test II/ Model test<br>1 Hour<br>All five Units | 50 x 1 = 50 Marks | MCQ | 50 Marks | Marks secured will be Converted to 15 marks |

| Question paper pattern | | Total Marks - 50 | |
|---|---|---|---|
| Basic Tamil | | Advanced Tamil | |
| Section -A | | Section -A | |
| Choose the correct answer | 10x2=20 | Choose the correct answer | 10x1=10 |
| Section -B | | Section -B | |
| True or false | 10x2=20 | Fill in the blanks | 10x2=20 |
| Section -C | | Section -C | |
| Answer in one page | 1x10=10 | Write an essay in two pages | 2x10=20 |

Question paper pattern for all other courses falling under Part I to Part III

CIA I : [1 1/2 Hours-2.5 Units] - 25 Marks

| SECTION | MARKS | DESCRIPTION | TOTAL | Remarks |
|---|---|---|---|---|
| Section – A | 8 x 0.5 = 04 Mark | MCQ | 25 Mark | Marks secured will be converted To 5 mark |
| Section - B | 3 x 3 = 09 Mark | Answer ALL Questions Either or Type ALL Questions Carry Equal Marks | | |
| Section - C | 2 x 6 = 12 Mark | | | |

CIA II /Model: [3 Hours-5 Units] - 75 Mark

| SECTION | MARKS | DESCRIPTION | TOTAL | Remarks |
|---|---|---|---|---|
| Section – A | 10 x 1 = 10 Mark | MCQ | 75 Mark | Marks secured will be converted To 5 mark |
| Section - B | 5 x 5 = 25 Mark | Answer ALL Questions (Either or Type Questions) Each Questions Carry Equal Mark | | |
| Section - C | 5 x 8 = 40 Mark | | | |

End Semester Examination: [3 Hours-5 Units] - 75 Mark

| SECTION | MARKS | DESCRIPTION | TOTAL |
|---|---|---|---|
| Section – A | 10 x 1 = 10 Mark | MCQ | 75 Mark |
| Section - B | 5 x 5 = 25 Mark | Answer ALL Questions (Either or Type Questions) Each Questions Carry Equal Mark | |
| Section - C | 5 x 8 = 40 Mark | | |

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A1TA | TAMIL - I | LANGUAGE- I | 4 | 1 | - | 03 |

PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு நாகரீகம், பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

COURSE OUTCOMES

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | வாழ்க்கைத் திறன்கள் (Life Skills)- மாணவர்களின் செயலாக்கத் திறனை ஊக்குவித்தல் | K3 |
| CO2 | மதிப்புக்கல்வி (Attitude and Value education) | K4 |
| CO3 | பாட இணைச்செயல்பாடுகள் (Co-curricular activities) | K4 |
| CO4 | சூழலியல் ஆக்கம் (Ecology) | K4 |
| CO5 | மொழி அறிவு (Tamil knowledge) | K5 |

MAPPING WITH PROGRAMME OUTCOMES

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | | ✓ | ✓ | | ✓ |
| CO2 | ✓ | | | ✓ | |
| CO3 | | ✓ | | | ✓ |
| CO4 | | | ✓ | | |
| CO5 | ✓ | | | ✓ | ✓ |

COURSE FOCUSES ON

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A1TA | TAMIL - I | SEMESTER I |
|---|---|---|

Total Credits: 3

Total Instruction Hours: 60 h

## Syllabus

### Unit I மறுமலர்ச்சிக் கவிதைகள் 13 h

1. இலக்கிய வரலாறு - மறுமலர்ச்சிக் கவிஞர்களின் தமிழ்ப்பணிகள்
2. பாரததேசம் - பாரதியார்
3. படி - பாரதிதாசன்
4. தமிழரின் பெருமை - நாமக்கல் கவிஞர்
5. தமிழ்க் கொலை புரியாதீர் - புலவர் குழந்தை
6. திரைத்தமிழ்

அ) 'விஞ்ஞானத்த வளர்க்கப் போறண்டி' எனத் தொடங்கும் பாடல் - உடுமலை நாராயண கவி

ஆ) 'சும்மா கிடந்த நிலத்தை' எனத் தொடங்கும் பாடல் - பட்டுக்கோட்டை கல்யாண சுந்தரனார்

இ) 'சமரசம் உலாவும் இடமே' எனத் தொடங்கும் பாடல் - மருதகாசி

ஈ) 'உன்னை அறிந்தால்' எனத் தொடங்கும் பாடல் - கண்ணதாசன்

### Unit II புதுக்கவிதைகள் 13 h

1. இலக்கிய வரலாறு - புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்
2. கடமையைச் செய் - மீரா
3. மலையாளக் காற்று - சிற்பி
4. ஒப்பிலாத சமுதாயம் - அப்துல் ரகுமான்
5. கன்னிமாடம் - மு.மேத்தா
6. கரிக்கிறது தாய்ப்பால் - ஆரூர் தமிழ்நாடன்
7. ஐந்தாம் வகுப்பு 'அ' பிரிவு - நா. முத்துக்குமார்
8. ஹைகூ கவிதைகள் - 10 கவிதைகள்

### Unit III பெண்ணியம் 09 h

1. தொலைந்து போனேன் - தாமரை
2. நீரில் அலையும் முகம் - அ. வெண்ணிலா
3. தற்காத்தல் - பொன்மணி வைரமுத்து
4. ஏனிந்த வித்தியாசங்கள் ? - மல்லிகா
5. புதையுண்ட வாழ்க்கை - சுகந்தி சுப்ரமணியன்

Unit IV சிறுகதைகள் 15 h

1. இலக்கிய வரலாறு - சிறுகதையின் தோற்றமும் வளர்ச்சியும்
2. கனகாம்பரம் - கு.ப.ராஜகோபாலன்
3. ஆற்றங்கரைப் பிள்ளையார் - புதுமைப்பித்தன்
4. பொம்மை - ஜெயகாந்தன்
5. காய்ச்சமரம் - கி. ராஜநாராயணன்
6. காட்டில் ஒருமான் - அம்பை
7. வேட்கை - சூர்யகாந்தன்

Unit V பயிற்சிப் பகுதி 10 h

அ. இலக்கணம்

1. வல்லின ஒற்று மிகும், மிகா இடங்கள் - ஒற்றுப்பிழை நீக்கி எழுதுதல்
2. ர,ற-ல,ழ,ள - ண,ந,ன வேறுபாடு - ஒலிப்பு நெறி, சொற்பொருள் வேறுபாடு அறிதல்)

ஆ. படைப்பாக்கம்

1. கவிதை - எழுதுதல் (15 வரிகள் முதல் 30 வரிகள் வரை)
2. சிறுகதை - எழுதுதல் (குறைந்தது 3 பக்கங்கள்)

## Text Book

1 தமிழ் மொழிப்பாடம் - 2022-2023, தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, கோயம்புத்தூர் – 641048, வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை – 600 098.

## References

1 பேராசிரியர் புலவர் சோம. இளவரசு, எட்டாம் பதிப்பு - 2014, தமிழ் இலக்கிய வரலாறு – மணிவாசகர் பதிப்பகம், சென்னை – 600 108.

2 பேராசிரியர் முனைவர் பாக்கியமேரி, முதற் பதிப்பு - 2013, இலக்கணம் - இலக்கிய வரலாறு - மொழித்திறன் - பூவேந்தன் பதிப்பகம், சென்னை-600 004.

3 இணையதள முகவரி: https://www.tamilvu.org

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A1HA | HINDI - I | LANGUAGE - 1 | 4 | 1 | - | 3 |

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- The techniques for expansion of ideas and translation process

COURSE OUTCOMES

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the fundamentals of novels and stories | K1 |
| CO2 | Understand the principles of translation work | K2 |
| CO3 | Expose the knowledge writing critical views on fiction | K2 |
| CO4 | Build creative ability | K3 |
| CO5 | Apply the power of creative reading | K3 |

MAPPING WITH PROGRAMME OUTCOMES

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | ✓ | ✓ |
| CO2 | | ✓ | | | ✓ |
| CO3 | | | | ✓ | |
| CO4 | ✓ | | ✓ | | |
| CO5 | | ✓ | ✓ | | ✓ |

COURSE FOCUSES ON

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A1HA | HINDI – I | SEMESTER I |
|---|---|---|

Total Credits: 3

Total Instruction Hours: 60 h

## Syllabus

**Unit I** 13 h

गद्य – नूतन गद्य संग्रह (जय प्रकाश)पाठ 1- रजियापाठ 2- मक्रीलपाठ 3- बहता पानी निर्मला
पाठ 4- राष्ट्रपिता महात्मा गाँधी

**Unit II** 13 h

कहानी कुंज- डॉ वी.पी. 'अमिताभ'(पाठ 1-4)

**Unit III** 12 h

व्याकरण : शब्द विचार ( संज्ञा, सर्वनाम,विशेषण)

**Unit IV** 12 h

अनुच्छेद लेखन

**Unit V** 10 h

अनुवाद अभ्यास-III (केवल अंग्रेजी से हिन्दी में) (पाठ 1 to 10)

**Text Books**

1. प्रकाशक: सुमित्र प्रकाशन 204 लीला अपार्ट्मेंट्स, 15 हेस्टिंग्स रोड'अशोक नगर इलाहाबाद-211001
2. प्रकाशक: गोविन्द प्रकाशनसदर बाजार, मथुरा उत्तरप्रदेश-281001
3. पुस्तक: व्याकरण प्रदिप – रामदेवप्रकाशक: हिन्दी भवन 36 टेगोर नगर इलाहाबाद-211024
4. पुस्तक: व्याकरण प्रदिप – रामदेवप्रकाशक: हिन्दी भवन 36 इलाहाबाद-211024
5. प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई -17

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A1MA | MALAYALAM- I | LANGUAGE - I | 4 | 1 | - | 3 |

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

COURSE OUTCOMES

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the fundamentals of novels and stories | K1 |
| CO2 | Understand the principles of translation work | K2 |
| CO3 | Expose the knowledge writing critical views on fiction | K2 |
| CO4 | Apply creative ability | K3 |
| CO5 | Build the power of creative reading | K3 |

MAPPING WITH PROGRAMME OUTCOMES

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | ✓ | ✓ |
| CO2 | | | | | ✓ |
| CO3 | | ✓ | ✓ | | |
| CO4 | ✓ | | | ✓ | |
| CO5 | | ✓ | | | ✓ |

COURSE FOCUSES ON

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A1MA | MALAYALAM - I | SEMESTER I |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 60 h

## Syllabus

**Unit I** **Novel** 14 h

Pathummayude Adu

**Unit II** **Novel** 10 h

Pathummayude Adu

**Unit III** **Short Story** 14 h

Nalinakanthi

**Unit IV** **Short Story** 10 h

Nalinakanthi

**Unit V** **Practical Application** 12 h

Expansion of ideas, General Essay and Translation

### Text Books

1. Vaikkam Muhammed Basheer, "Pathummayude Adu" (NOVEL), DC Books & Kottayam
2. T.Padmanabhan, "Nalinakanthi" (Short Story), DC Books & Kottayam.

### References

1. Malayala Novel Sahithyam.
2. Malayala Cherukatha Innale Innu.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A1FA | FRENCH - I | LANGUAGE - I | 4 | 1 | - | 3 |

PREAMBLE

This course has been designed for students to learn and understand

- the competence in general communication skills with oral, written and comprehension & expression
- the culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire competency in translating simple French sentences into English and vice versa

COURSE OUTCOMES

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the Basic verbs, numbers and accents | K1 |
| CO2 | Apply the adjectives and the classroom environment in France | K2 |
| CO3 | Select the Plural, Articles and the Hobbies | K2 |
| CO4 | Measure the Cultural Activity in France | K3 |
| CO5 | Evaluate the sentiments, life style of the French people and the usage of the conditional tense | K3 |

MAPPING WITH PROGRAMME OUTCOMES

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | | ✓ |
| CO2 | | | | | ✓ |
| CO3 | | | | | |
| CO4 | ✓ | | ✓ | | ✓ |
| CO5 | ✓ | | ✓ | | |

COURSE FOCUSES ON

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A1FA | FRENCH - I | SEMESTER I |
|---|---|---|

Total Credits: 3

Total Instruction Hours: 60 h

## Syllabus

**Unit I** **Salut I Page 10** 12 h

| Objectifs de Communication | Tâche | Activités de réception et de production orale |
|---|---|---|
| • Saluer<br>• Enter en contact<br>• avec quelqu'un.<br>• Se presenter.<br>• S'excuser | En cours de cuisine, premiers contacts avec les members d'un groupe | • Comprendre des personnes qui se saluent.<br>• Ēchanger pour entrer en contact, se présenter, saluer, s'excuser.<br>• Communiquer avec *tu* ou *vous*.<br>• Comprendre les consignes de classe<br>• Ēpeler son nom et son prénom.<br>Computer jusqu'à 10. |

**Unit II** **Enchanté I Page 20** 12 h

| Objectifs de Communication | Tâche | Activités de réception et de production orale |
|---|---|---|
| • Demander de se presenter.<br>• Présenter quelqu'un. | Dans la classe de français, se presenter et remplir une fiche pour le professeur. | • Comprendre les informations essentielles dans un échange en milieu professionnel.<br>• Ēchanger pour se presenter et présenter quelqu'un. |

**Unit III** **J'adore I Page 30** 12 h

| Objectifs de Communication | Tâche | Activités de réception et de production orale |
|---|---|---|
| • Exprimer ses gouts. | Dans un café, participer à une soirée de rencontres rapides et remplir de taches d'appréciation | • Dans une soirée de recontres rapid comprendre des personnes qui échangent sur elles et sur leurs goût<br>• Comprendre une personne qui parler des goûts de quelqu'un d'autre |

**Unit IV J'adore I Page 30** 14 h

| Objectifs de Communication | Tâche | Activités de réception et de production orale |
|---|---|---|
| • Présenter quelqu'un | Dans un café, participer à une soirée de rencontres rapides et remplir de taches d'appréciation | • Exprimer ses goûts<br>• Comprendre une demande laissée sur un répondeur téléphonique.<br>• Parler de ses projets de week-end |
| Autoévaluation du module I Page 40 – Préparation au DELF A1 page 42 | | |
| Demander à quelqu'un de faire quelque chose.<br>Demander poliment.<br>Parler d'actions passes.<br>Tu veux bien? | Organiser un programme d'activités pour accueillir une personne importante | Comprendre une personne demande un service à quelqu'un.<br>Demander à quelqu'un de faire quelque chose.<br>Imaginer et raconter au passé à partir de situations dessinées. |

**Unit V Practical Application** 10 h

Make in Own Sentences

**Text Book**

1 Regine Merieux, Yves Loiseau. 2012. LATITUDES – 1: Méthode de français (Page No: 9-55) Les Editions Dider, Paris, Imprime en Roumanie par Canale en Janvier

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231EL1A1EA | ENGLISH - I | LANGUAGE- II | 4 | - | 1 | 3 |

PREAMBLE

This course has been designed for students to learn and understand

- the effect of dialogue, imagery and varied genres
- any spontaneous spoken discourse and respond to them with proper sentence structure
- the transactional concept of English language

COURSE OUTCOMES

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Identify the various aspects in poetry | K2 |
| CO2 | Infer linguistic and non-linguistic features of the context for understanding and interpreting | K3 |
| CO3 | Construct sentences and convey messages effectively in real life situations | K3 |
| CO4 | Apply different reading strategies with varying speed | K3 |
| CO5 | Prepare modules with their own ideas and present them coherently in a grammatically correct form | K3 |

MAPPING WITH PROGRAMME OUTCOMES

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | ✓ | ✓ | ✓ |
| CO2 | | ✓ | | | ✓ |
| CO3 | ✓ | ✓ | | ✓ | |
| CO4 | | | ✓ | | |
| CO5 | ✓ | ✓ | | | ✓ |

COURSE FOCUSES ON

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231EL1A1EA | ENGLISH- I | SEMESTER I |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 60 h

## Syllabus

**Unit I** Genre Studies 12 h

Nissim Ezekiel: The Worm- Author's Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques– Annotations

Niyi Osundare: Our Earth Will Not Die- Author's Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques– Annotations

A. G. Gardiner: On Superstitions- Author's biography- Narrative structure- Exploration of the text- passage analysis- insight of ideas- cohesion and context- style- language techniques- Annotation

Nancy Bella: Clever Thief- Author's Biography- Plot Summary- Detailed summary and Analysis- Themes- Important Quotations- Characters- Description - analysis- Terms- Symbols- Critical analysis

H. G. Wells: The Truth about Pyecraft- Author's Biography-narrative structure- passage analysis- insight of ideas- cohesion and context- style- language techniques

**Unit II** Listening Skills 12 h

Listening vs. hearing- Types of listening, Tips to enhance Listening Skills, Non-verbal and Verbal signs of active listening - Comprehensive Listening - Listening to pre-recorded audios on speeches, interviews and conversations - Listening Activities- Listening and responding to complaints (formal situation), Listening to problems and offering solutions (informal)

**Unit III** Speaking Skills 14 h

Formal occasions- Introducing oneself, Introducing others, Enquiries and Seeking permission, Making short presentations- Informal occasions- Requests, Offering help, Congratulating, Farewell party, graduation speech- Giving instructions to do a task and to use a device, Giving and asking directions

**Unit IV** Reading Skills 10 h

Study Skills: Skimming and Scanning- Reading different kinds of texts- Types of reading-Developing a good reading speed, reading aloud, Referencing skill - Word

Power (Denotation and Connotation) - Reading comprehension, Data interpretation –Charts, Graphs, Advertisements

**Unit V** Writing Skills 12 h

Sentence patterns, Note- making and note taking-Strategies - Paragraph writing: Structure and Principles - Academic Writing - Formal and Informal Letters, Report, Book /Movie Review

**Text Books**


1. Gardiner, A. G. 1926. Alpha of the Plough: Second series, J.M. Dent & Sons Ltd., London, United Kingdom. pg.no-151-156. (Unit I)
2. Ezekiel, Nissim. "The Worm," Crazy Romantic Love, www. mianmawaisarain.live/2020/05/poem-worm-nissim-ezekiel.html. Accessed 3 Aug. 2022. (Unit I)
3. < http://livros01.livrosgratis.com.br/ln000835.pdf /> (Unit I)
4. Mithra, S. M. 1919. Hindu Tales from the Sanskrit, Macmillan & Co Ltd., London, United Kingdom. pg.no-127-142. (Unit I)
5. Nation, I. S. P and Jonathan Newton. 2009. Teaching ESL/EFL Listening and Speaking. Routledge, New York, United States. (Unit II)
6. Prabha, Dr. R. Vithya & S. Nithya Devi. 2019. Sparkle. (1st Edn.) McGraw - Hill Education, Chennai, India. (Unit III– V)


**References**


1. Our Earth Will Not Die By Niyi Osundare." Studocu.Com, studocu.com /in/document/bangalore-university/bachelor-of-computer-applications /1586771577-our-earth-will-not-die/27675462. Accessed 3 Aug. 2022.
2. OnSuperstitions."THEHISTORIAN,thehistorian1947.wordpress.com/2019/0 3/08/on-superstitions-by-a-g-gardiner. Accessed 3 Aug. 2022.
3. Swales, John M. & Feak, Christine B. 2012. Academic Writing for Graduate Students: Essential Tasks and Skills, University of Michigan Press, Michigan, United States.
4. Rudzka, Brygida -Ostyn, 2003. Word Power: Phrasal Verbs and Compounds: A Cognitive Approach, Mouton de Gruyter, New York, United States.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 234AI1A1CA | PROBLEM SOLVING AND PROGRAMMING IN C | CORE | 4 | 1 | - | 4 |

PREAMBLE

This course has been designed for students to learn and understand

- The fundamental aspects of programming and problem solving
- The C language fundamentals
- The representation and working of arrays, pointers, functions and files

COURSE OUTCOMES

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Illustrate the basic principles of programming and problem solving | K2 |
| CO2 | Understand the fundamentals of C Language | K2 |
| CO3 | Implement decision making using branching and looping. | K3 |
| CO4 | Develop programs using arrays and functions | K3 |
| CO5 | Execute programs using pointers, structures and files | K3 |

MAPPING WITH PROGRAMME OUTCOMES

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | ✓ | | |
| CO2 | ✓ | | ✓ | | |
| CO3 | ✓ | ✓ | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | ✓ | |
| CO5 | ✓ | ✓ | ✓ | ✓ | |

COURSE FOCUSES ON

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human Values/ Ethics |

| 234AI1A1CA | PROBLEM SOLVING AND PROGRAMMING IN C | SEMESTER I |
|---|---|---|

**Total Credits:** 4

**Total Instruction Hours:** 60 h

## Syllabus

**Unit I** Introduction to Programming and Problem Solving 12 h

Introduction: Types of Programming Languages – High level Languages – Assembly Languages – Machine Level Languages – System Software – Operating Systems – Compiler – Linker and Interpreter. Problem Solving Strategies: Steps involved in problem solving - Algorithms - Flow Charts - Symbols used in Flow Charts - Pseudo Codes – Structured Programming - Sequence – Selection – Repetition – Modular Programming.

**Unit II** C Language Fundamentals 12 h

Language Fundamentals: Introduction to C - Basic Structure of C Program – Constants – Variables – Data Types - Operators – Expressions – Evaluation of Expressions - Operator Precedence and Associativity - Managing the Input and Output – Formatted I/O – Unformatted I/O – Storage classes- Simple programs for logic building.

**Unit III** Decision Making and Arrays 12 h

Branching: Simple if Statement – if-else statement – elseif Ladder – Switch statement – goto, break and continue statements. Looping: while loop – do-while loop -for loop- nested for loop – Pre-processor Directives: Macro substitution – File inclusion – Compiler control directives. Arrays: Introduction – Types of arrays – Declaration and Initialization of Arrays – Dynamic Arrays.

**Unit IV** Strings, Functions and Pointers 12 h

Strings: Declaring and Initializing the string variables – String handling functions. Functions – Need for functions – Elements of functions – Category of functions – Passing arrays to functions - Recursion. Pointers: Understanding Pointers – Declaration and Initialization of pointer variables – Accessing variables through pointers – Pointers and arrays.

**Unit V** Structures and Files 12 h

Structures: Defining a structure – Declaring structure variables – Accessing structure member – Array of structures - Structure within structures -Unions. Files: Defining and opening a File – Closing a file – I/O Operations on files - Dynamic memory allocation - Command Line Arguments.

## Text Books


1 Ashok N. Kamthane, 2009, "Programming and Data Structures", 1st Edition, Pearson Education.

2 Byron Gottfried, 2018, "Schaum's Outline of Programming with C", 4th Edition, McGraw Hill Education.


## References


1 E.Balagurusamy, 2017, "Programming in ANSI C", 7th Edition TMH.

2 H. Schildt, 2000,"C: The Complete Reference", 4th Edition, TMH.

3 ReemaThareja , 2015, "Programming in C", 2nd Edition, Oxford University Press.

4 Anita Goel, Ajay Mittal, 2016,"Computer Fundamentals and Programming in C", 1st Edition, Pearson.

| 234DA1A1CP | CORE PRACTICAL : C PROGRAMMING | SEMESTER I |
|---|---|---|

**Total Credits:** 2
**Total Instructions Hours:** 48h

| S.No | List of Programs |
|---|---|
| 1 | Simple Program to understand the concepts of data types |
| 2 | Program to get familiarity on using conditional statements |
| 3 | Program to implement patterns |
| 4 | Program to perform matrix and Dynamic Array operations |
| 5 | Program to Work with pointers |
| 6 | Program to implement functions |
| 7 | Program to perform recursion |
| 8 | Program to create and implement String manipulation |
| 9 | Program to test dynamic Memory Allocations |
| 10 | Program to implement structures |
| 11 | Program to perform union and enumerated Data types |
| 12 | Application Program using File operations |

**Note:** Out of 12 programs 10 Mandatory

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 234IT1A1CA | DIGITAL COMPUTER FUNDAMENTALS | CORE | 4 | - | - | 4 |

PREAMBLE

This course has been designed for students to learn and understand

- The concepts of number system and circuits
- The principles of logic gates and memory
- The design and architecture of microprocessors and microcontrollers

COURSE OUTCOMES

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the types of number systems, Boolean Algebra | K2 |
| CO2 | Understand and analyze Logic gates | K2 |
| CO3 | Illustrate the concepts of combinational circuits | K3 |
| CO4 | Understand the different types of sequential logic and memory organization | K2 |
| CO5 | Understand the architecture of microprocessors and microcontrollers | K2 |

MAPPING WITH PROGRAMME OUTCOMES

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | ✓ | | |
| CO2 | ✓ | | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | ✓ | |
| CO5 | ✓ | ✓ | ✓ | ✓ | |

COURSE FOCUSES ON

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human Values/ Ethics |

| 234IT1A1CA | DIGITAL COMPUTER FUNDAMENTALS | SEMESTER I |
|---|---|---|

**Total Credits:** 4

**Total Instruction Hours:** 48 h

## Syllabus

**Unit I** Binary Systems and Boolean Algebra 10 h

Binary Numbers- Number base conversions- Octal and Hexadecimal conversions- Complements- Binary codes - Decimal codes.

Basic Definitions-Boolean functions- Canonical standard forms: Minterms and Maxterms - Sum of Minterms-Product of Maxterms-conversion between canonical forms.

**Unit II** Logic Gates and Boolean functions 8 h

Digital Logic Gates: AND, OR, Inverter, Buffer, NAND, NOT, Exclusive-OR, Exclusive-NOR.

The Map method-Two and three-variable Maps-Four variable Map - Five and Six-Variable Maps- Product of Sum simplification - Don't care conditions.

**Unit III** Combinational Logic 10 h

Adders: Half-Adder, Full-Adder. Subtractors Half-Subtractor, Full-Subtractor. Multilevel NAND Circuits: Universal Gate. Multilevel NOR Circuits: Universal Gate. Binary Parallel Adder- Decimal Adder - BCD Adder. Decoders: Demultiplexers- Encoders - Multiplexer.

**Unit IV** Sequential Logic & Memory Unit 10 h

Introduction- Flip-flops-Clocked RS Flip-flop - D Flip-flop - JK Flip-flop - Design of Counters- Registers -Ripple Counters.

The Memory Unit - Random Access Memories: Integrated-circuit Memory- Magnetic-core Memory.

**Unit V** Introduction to Microprocessors and Microcontrollers 10 h

Introduction – Microprocessor- Microcomputer- Architecture of Microprocessors- History- Evolution- Microprocessor Applications- Evolution of Microcontrollers- Application of Microcontrollers. Architecture of 8085 Microprocessor- Pin diagram of 8085 Microprocessor.

## Text Books


1. M.Morris Mano, 2019, "Digital Logic and Computer Design", Pearson India Education.
2. Soumitra Kumar Mandal, 2018, "Microprocessors and Microcontrollers – Architecture, Programming and Interfacing using 8085, 8086, 8051", 15th Edition, Tata Mc Graw Hill Education.


## References


1. S. Salivahanan and S Arivazhagan, 2018, "Digital Circuits and Design", 5th Edition, Oxford University Press, Noida
2. Thomas Floyd L., 2015, "Digital Fundamentals", 11th Edition, Pearson Publication Ltd, New Delhi
3. M Morris Mano, 2016, " Digital Logic and Computer Design", 5th edition, Pearson
4. Aditya P Mathur, 2016, "Introduction to Microprocessor", 3rd Edition, McGraw Hill Education.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 232MT1A1ID | MATHEMATICS FOR COMPUTING-I | IDC | 4 | 1 | - | 4 |

PREAMBLE

This course has been designed for students to learn and understand

- the concepts of matrices and determinants
- the technique of obtaining eigen values and eigen vectors
- the method of solving linear system of equations

COURSE OUTCOMES

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | define the various terms of matrices and the operations involved in it | K1 |
| CO2 | identify the determinant value of matrices | K2 |
| CO3 | determine the eigen values and eigen vectors through different methods | K3 |
| CO4 | recognize the direct and indirect methods for solving algebraic equations | K1 |
| CO5 | discuss the method of solving differential and integral problems | K2 |

MAPPING WITH PROGRAMME OUTCOMES

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | ✓ | |
| CO2 | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | | |
| CO5 | ✓ | ✓ | ✓ | | |

COURSE FOCUSES ON

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human Values/ Ethics |

| 232MT1A1ID | MATHEMATICS FOR COMPUTING-I | SEMESTER I |
|---|---|---|

**Total Credits:** 4

**Total Instruction Hours:** 60 h

## Syllabus

**Unit I** Systems of Linear Equations 13 h

Introduction to system of linear equations- - linear systems in two and three unknown - augmented matrices and elementary row operations - Gaussian elimination- Matrices and Matrix operations - inverses - algebraic properties of matrices - elementary matrices - method for finding $A^{-1}$- invertible matrices - diagonal matrices - triangular matrices - symmetric matrices

**Unit II** Determinants 12 h

Introduction - determinants by cofactor expansion- minors and cofactors - technique for evaluating 2×2 and 3×3 determinants - evaluating determinants by row reduction - elementary row operations - Matrices with proportional rows or columns - properties of determinants - Cramer's rule.

**Unit III** Eigenvalues and Eigenvectors 10 h

Definition of eigenvalues and eigenvectors - computing eigenvalues and eigenvectors - Diagonalization - Geometric and Algebraic multiplicity - complex vector spaces - vectors in $C^n$ - differential equations - first order linear systems - solution by diagonalization

**Unit IV** Solution of Algebraic , Transcendental and Linear Systems of Equations 13 h

Introduction - Newton-Raphson method-Direct methods -Matrix inversion method-Gaussian elimination method - Gauss Jordan method Iterative methods - Gauss Seidel Method - Gauss Jacobi method

**Unit V** Interpolation, Numerical Differentiation and Integration 12 h

Introduction - Finite differences - Newton's formulae for interpolation – Interpolation with unevenly spaced points: Lagrange's interpolation formula-Numerical differentiation - maximum and minimum values of a tabulated Function - Numerical integration - Trapezoidal rule - Simpson's 1/3 Rule - Simpson's 3/8 Rule.

## Text Books


1. Howard Anton and Chris Rorres, 2015 "Elementary Linear Algebra with Supplemental Applications", 11th Edition, Wiley India Pvt. Ltd, New Delhi. (Unit I to III)
2. Sastry, S.S, 2012, "Introductory methods of Numerical Analysis", Prentice-Hall of India. New Delhi. (Unit IV to V)


## References


1. Partha Karmakar, Chandan Bikash Das, Pabitra kumar Gouri, 2021 "Introduction to Linear Algebra", 1st Edition, Books and Allied(P) Ltd, Kolkata
2. Gilbert Strang, 2005, "Linear Algebra and its Applications", 4th Edition, Brooks/Cole, Noida.
3. Veerarajan.T, Ramachandran.T, 2004, "Theory and Problems in Numerical Methods With Programs in C and C++",10th Edition, Tata Mc- Graw Hill Publishing Company Limited, New Delhi.
4. Venkataraman,M.K. 2004, "Numerical Methods in Science and Engineering", 4th Edition, NPC

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 233MB1A1AA | ENVIRONMENTAL STUDIES | AECC | 2 | - | - | 2 |

PREAMBLE

This course has been designed for students to learn and understand

- Multi disciplinary aspects of Environmental studies
- Importance to conserve the Biodiversity
- Causes of Pollution and its control

COURSE OUTCOMES

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the importance of natural resources in order to conserve for the future. | K2 |
| CO2 | Infer on Natural resources and its conservation | K2 |
| CO3 | Apply the knowledge on Biodiversity and its conservation | K3 |
| CO4 | Relate effects, causes and control of air, water, soil and noise pollution etc., | K2 |
| CO5 | Build awareness about sustainable development and Environmental protection | K2 |

MAPPING WITH PROGRAMME OUTCOMES

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | | | | | ✓ |
| CO2 | | | | | ✓ |
| CO3 | | | | | ✓ |
| CO4 | | | | | ✓ |
| CO5 | | | | | ✓ |

COURSE FOCUSES ON

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human Values/ Ethics |

| 233MB1A1AA | ENVIRONMENTAL STUDIES | SEMESTER I |
|---|---|---|

**Total Credits:** 2

**Total Instruction Hours:** 24 h

## Syllabus

**Unit I** Introduction to Environmental studies & Ecosystems 5 h

Introduction to Environmental studies& Ecosystems: Multidisciplinary nature of environmental studies; components of environment – atmosphere, hydrosphere, lithosphere and biosphere. Scope and importance; Concept of sustainability and sustainable development. Ecosystem- Structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession.

**Unit II** Natural Resources: Renewable and Non-renewable Resources 5 h

Natural Resources: Renewable and Non-renewable Resources: Land Resources and land use change; Land degradation, soil erosion and desertification. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. Water: Use and overexploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs.

**Unit III** Biodiversity and Conservation 5 h

Biodiversity and Conservation: Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and global biodiversity hot spots. India as a mega-biodiversity nation; Endangered and endemic species of India. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

**Unit IV** Environmental Pollution, Environmental Policies & Practices 5 h

Environmental Pollution, Environmental Policies & Practices: Environmental pollution: types, causes, effects and controls; Air, water, soil, chemical and noise pollution. Nuclear hazards and human health risks. Solid waste management: Control measures of urban and industrial waste. Pollution case studies. Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture. Environment Laws: Environment Protection Act; Prevention & Control of Pollution Act – Air & Water. Wildlife Protection Act; Forest Conservation Act;

**Unit V** Human Communities and the Environment& Field Work 4 h

Human Communities and the Environment & Field Work: Human population and growth: Impacts on environment, human health and welfares. Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Environmental communication and public awareness. Visit to an area to document environmental assets; river/forest/flora/fauna, etc. Population explosion – Family Welfare Programmes. Role of Information Technology in Environment and human health. Role of the Colleges, Teachers and Students in village adoption towards clean, green and make in villages in various aspects.

**Text Books**


1 Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.

2 Gadgil, M., & Guha, R.1993. This Fissured Land: An Ecological History of India. Univ. of California Press.


**References**


1 Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge

2 Gleick, P.H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press

3 Groom, Martha J. Gary K. Meffe, and Carl Ronald carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006

4 Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36-37.

5 McCully, P.1996. Rivers no more: the environmental effects of dams (pp. 29-64). Zed Books

6 McNeil, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century

7 Odum, E.P., Odum, h.T. & Andrews, J.1971. Fundamentals of Ecology. Philadelphia: Saunders.


9/6/23
BoS Chairman/HoD
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Coimbatore – 641 048

Dr.N.G.P. Arts and Science College
APPROVED

| BoS- 8th | AC- 15th | GB- 20th |
|---|---|---|
| 09.06.23 | 14.07.23 | 05.08.23 |

Dr.NGPASC
COIMBATORE | INDIA

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A2TA | TAMIL- II | LANGUAGE- I | 4 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடுநாகரீகம் ,பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | வாழ்க்கைத்திறன்கள் (Life Skills) மாணவர்களின் செயலாக்கத்திறனை ஊக்குவித்தல் | K1 |
| CO2 | மதிப்புக்கல்வி (Attitude and Value education) | K2 |
| CO3 | பாடஇணைச்செயல்பாடுகள் (Co-curricular activities) | K2 |
| CO4 | சூழலியல் ஆக்கம் (Ecology) | K3 |
| CO5 | மொழி அறிவு (Tamil knowledge) | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | | |
| CO2 | ✓ | | | ✓ | |
| CO3 | ✓ | ✓ | | | |
| CO4 | ✓ | | ✓ | | |
| CO5 | ✓ | | | ✓ | |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A2TA | TAMIL- II | SEMESTER II |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 60 h

## Syllabus

**Unit I** அற இலக்கியம் 13 h

1. இலக்கிய வரலாறு- பதினெண்கீழ்க்கணக்குநூல்கள்

2.திருக்குறள்

அ. அறன்வலியுறுத்தல்- அ. எண் 04

ஆ. நட்பாராய்தல் - அ. எண் 80

இ. நாடு- அ. எண் 74

ஈ. குறிப்பறிதல்- அ. எண் 110

**Unit II** அற இலக்கியம் 13 h

1. நாலடியார் - அறிவுடைமை
2. மூதுரை - ஔவையார் - 10 பாடல்கள் 6, 7, 9, 10, 14, 16, 17, 23, 26, 30
3. இனியவைநாற்பது- பூதஞ்சேந்தனார் - முதல் 10 பாடல்கள்

**Unit III** அறநெறிக் கட்டுரைகள் 09 h

1. இலக்கியவரலாறு - தமிழ் உரைநடையின் தோற்றமும் வளர்ச்சியும்

2. கலைகள்-உ.வே.சா

3. சங்க நெறிகள்- வ.சுப.மாணிக்கம்

**Unit IV** அறநெறிக் கட்டுரைகள் 15 h

1. வீர வணக்கம் - க.கைலாசபதி
2. தமிழர் பண்பாடு - டாக்டர் சோ.நா.கந்தசாமி
3. இணையத் தமிழ் வளர்ச்சி - முனைவர் ப.அர.நக்கீரன்

**Unit V** பயிற்சிப் பகுதி 10 h

1.இலக்கணம்-வழு, வழுவமைதி,வழாநிலை

2.அலுவலகம் சார்ந்த கடிதம் -விண்ணப்பங்கள், வேண்டுகோள்,முறையீடு

3.படைப்பாக்கம்-பொதுத்தலைப்பில் கட்டுரைகள் எழுதுதல்

## Text Book

1 தமிழ் மொழிப்பாடம்-2023-2024,தொகுப்பு: தமிழ்த்துறை , டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி,கோயம்புத்தூர். வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ் ,சென்னை. (Unit I to V)

## References

1 பேராசிரியர் புலவர் சோம. இளவரசு,எட்டாம் பதிப்பு. 2014. தமிழ் இலக்கிய வரலாறு- மணிவாசகர் பதிப்பகம்,சென்னை.

2 பேராசிரியர் முனைவர் பாக்கியமேரி ,முதற் பதிப்பு. 2013. இலக்கணம்-இலக்கிய வரலாறு- மொழித்திறன்- பூவேந்தன் பதிப்பகம்,சென்னை. .

3 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY. வலைதள முகவரி : https://www.tamilvu.org

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A2HA | HINDI- II | LANGUAGE- I | 4 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- the techniques for expansion of ideas and translation process

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the fundamentals of novels and stories | K1 |
| CO2 | Understand the principles of translation work | K2 |
| CO3 | Expose the knowledge writing critical views on fiction | K2 |
| CO4 | Build creative ability | K3 |
| CO5 | Apply the power of creative reading | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | ✓ | ✓ |
| CO2 | ✓ | ✓ | | | ✓ |
| CO3 | ✓ | | ✓ | ✓ | ✓ |
| CO4 | ✓ | | ✓ | | ✓ |
| CO5 | ✓ | ✓ | ✓ | | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A2HA | HINDI- II | SEMESTER II |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 60 h

## Syllabus

**Unit I** 13 h

आधुनिकपद्य – शबरी(श्रीनरेशमेहता)

**Unit II** 13 h

उपन्यास: सेवासदन-प्रेमचन्द

**Unit III** 12 h

कहानी-किरीट- डा उषा पाठक / डा अचला पाण्डेय

पाठ 1.कफ़न, 3. चीफ़ की दावत

**Unit IV** 12 h

पत्र लेखन: (औपचारिक या अनौपचारिक)

**Unit V** 10 h

अनुवाद अभ्यास-III (केवल हिन्दी से अंग्रेजी में) (पाठ 1 to 10)

## Text Books

1. प्रकाशक: लोकभारती प्रकाशन पहली मंजिल , दरबारी बिल्डिंग,महात्मा गाँधी मार्ग , इलाहाबाद. (Unit I)
2. प्रकाशक: सुमित्र प्रकाशन 204 लीला अपाट्मेंट्स , 15 हेस्टिंग्स रोड 'अशोक नगर इलाहाबाद . (Unit II)
3. प्रकाशक: राधाकृष्ण प्रकाशन दिल्ली. (Unit III)
4. पुस्तक: व्याकरण प्रदिप – रामदेवप्रकाशक: हिन्दी भवन 36 इलाहाबाद. (Unit IV)
5. प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई. (Unit V)

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A2MA | MALAYALAM- II | LANGUAGE - I | 4 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the fundamentals of novels and stories | K1 |
| CO2 | Understand the principles of translation work | K2 |
| CO3 | Expose the knowledge writing critical views on fiction | K2 |
| CO4 | Build creative ability | K3 |
| CO5 | Apply the power of creative reading | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | ✓ | ✓ |
| CO2 | ✓ | | | | ✓ |
| CO3 | ✓ | ✓ | ✓ | | ✓ |
| CO4 | ✓ | | ✓ | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A2MA | MALAYALAM- II | SEMESTER II |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 60 h

## Syllabus

**Unit I** **Novel** 12 h

Enmakaje: Chapter1- Chapter5

**Unit II** **Novel** 10 h

Enmakaje: Chapter 6- Chapter 10

**Unit III** **Novel** 12 h

Enmakaje: Chapter 11- Chapter 15

**Unit IV** **Autobiography** 14 h

NeermathalamPoothaKalam: Chapter 1- Chapter 10

**Unit V** **Autobiography** 12 h

NeermathalamPootha Kalam: Chapter 11- Chapter 20

**Text Books**

1. Ambika SuthanMangad, Enmakaje (Novel), DC Books Kottayam, Kerala, India. (Unit I to III)
2. Madhavikkutty, NeermathalamPootha Kalam (Autobiography), DC Books Kottayam, Kerala, India. (Unit IV & V)

**References**

1. MalayalaNovelSahithyam, DC Books Kottayam, Kerala, India.
2. MalayalaSahithyaCharithram, National Books Kottayam, Kerala, India.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A2FA | FRENCH- II | LANGUAGE - I | 4 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written- Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the Basic verbs, numbers and accents | K1 |
| CO2 | Apply the adjectives and the classroom environment in France | K2 |
| CO3 | Select the Plural, Articles and the Hobbies | K2 |
| CO4 | Measure the Cultural Activity in France | K3 |
| CO5 | Evaluate the sentiments, life style of the French people and the usage of the conditional tense | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | | ✓ |
| CO2 | ✓ | ✓ | | | ✓ |
| CO3 | | | ✓ | ✓ | ✓ |
| CO4 | ✓ | | ✓ | | ✓ |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A2FA | FRENCH- II | SEMESTER II |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 60 h

**Syllabus**

**Unit I** 12 h

| | | |
|---|---|---|
| Proposer, accepter, refuserune invitation.<br>Indiquer la date. | Organiser une soirée au cinéma avec des amis, par téléphone et par courriel. | Comprendreunemessage d'invitationsurunréponde urtéléphonique.<br>Inviter quelqu'un accepter ourefuserl'invitation. |

**Unit II** 12 h

| | | |
|---|---|---|
| Prendreet fixer un rendez-vous.<br>Demander etindiquerl'heure. | Organiser une soirée au cinéma avec des amis, par téléphone et par courriel. | Comprendre des personnes qui fixentunrendez-vous par téléphonique.<br>Prendreun rendez-vous par telephone |

**Unit III** 12 h

| | | |
|---|---|---|
| Exprimer son point de vue positif et négatif.<br>S'informersur le prix.<br>S'informersur la quantitité.<br>Exprimer la quantitité. | En groupes, choisir un cadeau pour un ami. | Exprimer son point de vuesur des idées de cadeau.<br>Faire des achatsdans un magasin |

**Unit IV** 14 h

| | | |
|---|---|---|
| Demander etindiquerune direction.<br>Localiser (près de, en face de ….).<br>Exprimerl'obligationl' Interdit.Conseiller. | Suivre un itinéraire à l'aided'indications par telephone et d'un plan.<br>Par courrierélectronique, donner des informations et des conseils à un ami qui veut voyager. | Comprendre des indications de direction.<br>Comprendre des indications de lieu.<br>Comprendreune chanson.<br>Comprendre de courts messages qui experiment l'obligationoul'interdictio n.<br>Donner des conseils à des personnesdans des situations données. |

**Unit V** 10 h

| |
|---|
| Make in Own Sentences |

**Text Book**

1 Regine Merieux, Yves Loiseau, "LATITUDES - 1" (Page No: 56-101) (Methode de Français), Goyal Publisher & Distributors Pvt.Ltd., 86 UB Jawahar Nagar (Kamala Nagar), New Delhi-7 Les Editions Dider, Paris, 2008- Imprime en Roumanie par Canale en Janvier 2012. ( Unit I to IV)

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231EL1A2EA | ENGLISH- II | LANGUAGE- II | 4 | - | 1 | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the language for specific purposes through various literary manuscripts
- the process of communicative competencies in academics through authentic contexts
- the different formats of business correspondence with lucidity and accuracy via various media

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Identify and appreciate the eminent writers' works of various genres | K1 |
| CO2 | Infer and comprehend complex situational talks | K2 |
| CO3 | Relate formal and informal communicative contexts to speak fluently | K2 |
| CO4 | Construct the denotative and connotative meanings while reading specialized texts | K3 |
| CO5 | Develop the skill of writing through descriptions, narrations and essays | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | ✓ | |
| CO2 | | ✓ | | | ✓ |
| CO3 | | ✓ | | | ✓ |
| CO4 | ✓ | ✓ | ✓ | | ✓ |
| CO5 | | | ✓ | | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231EL1A2EA | ENGLISH- II | SEMESTER II |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 60 h

**Syllabus**

**Unit I** Genre Studies 15 h

John Keats: To a Friend Who Sent Me Some Roses - Author's Note - title indications- outline-paraphrasing the poem- context of poem- form- poetic devices- techniques- Style

A. G. Gardiner: On Habits - Author's Note- Title indications- Outline -Passage Analysis - context of the Prose - Narrative techniques- Style

Sudha Murthy: The Enchanted Scorpions- Author's Note - title indications-Plot summary- Outline of the story -devices- Narrative techniques- Style

David Pinski: A Dollar- Author's Note- Title indications -Plot Summary- Critical Analysis-Themes- Character analysis - Terms- Symbols

**Unit II** Listening Skills 10 h

Listening to Talks/Lectures by Specialists on selected subject-specific topics-Listening to Public Announcements- Listening to Instructions and Directions-Listening to Speeches- Listening to process/event descriptions to identify causes & effects

**Unit III** Speaking Skills 11 h

Small Talk- Mini Presentations and Making Recommendations- Group Discussions, Debates, and Expressing opinions through Role play- Picture Description-Giving Instruction to Use a Product- Presenting a Product- Summarizing a Lecture-Narrating Personal Experiences/ Events- Interviewing a Celebrity- Scientific Lectures- Educational Videos- Debates- Different Viewpoints on an Issue

**Unit IV** Reading Skills 12 h

Reading Biographies, Newspaper Reports, Technical Blogs- ReadingAdvertisements - Gadget Reviews- Newspaper Articles - Journal Reports – Reading Editorials & Blogs- Case Studies- Excerpts from Literary Texts

**Unit V** Writing Skills 12 h

Inferring & Interpreting- Predicting Reorganizing Material- Summary Writing Based on the Reading Passages- Writing - Emails & Essay Writing (Descriptive or Narrative)- Grammar - Tenses- Question Types: Wh/ Yes or No/ and Tags

**Text Books**


1. Keats, John. To a Friend Who Sent Me Some Roses. <https://www.Poets.org , 1820, poets.org/poem/ friend-who-sent-me-some-roses.html/> (Unit I)
2. Gardiner, Alfred George. On Habits (n.d.). <Https://Www. Gutenberg. Org/ Files/47429/47429-H/47429-H.Html/> (Unit I)
3. Murthy, Sudha. The Enchanted Scorpions. (n.d.). <https://www. ssgopalganj.in/online/EBooks/CLASS%20VI/Grandma's%20Bag%20of%20 Stories%20by%20Sudha%20Murthy.pdf/> pp-34-39. (Unit I)
4. Pinski, David. A Dollar - a One-act Play.<www.one-act-plays.com/ comedies/dollar.html/> (Unit I)
5. Hart, Steve, Aravind R. Nair, Veena Bhambhani. 2016. Embark: English for Undergraduates. Cambridge University Press, New Delhi, India. (Unit II)
6. Lakshminarayan. 2012. A Course Book On Technical English. Scitech Publications Pvt. Ltd., New Delhi, India. (Unit III)
7. Raman, Meenakshi & Sangeeta Sharma. 2016. Technical Communication- Principles And Practice, Oxford University Press, New Delhi, India. (Unit IV)
8. Viswamohan, Aysha. 2017. English For Technical Communication (With CD), McGraw Hill (India) Private Limited, New Delhi, India. (Unit V)


**References**


1. Bajwa and Kaushik. 2010. Springboard to Success- Workbook for Developing English and Employability Skills. Orient Black Swan, Chennai, India.
2. Chellammal, V. 2003. Learning to Communicate. Allied Publishing House, New Delhi, India
3. Krishnaswamy. N, LalithaKrishnaswamy& B.S. Valke. 2015. Eco English, Learning English through Environment Issues. An Integrated, Interactive Anthology. Bloomsbury Publications, New Delhi, India.
4. Syamala. V. 2002. Effective English Communication for You. Emerald Publishers, Chennai, Tamil Nadu, India.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 234CA1A2CA | DATA STRUCTURES | CORE | 4 | 1 | - | 4 |

**PREAMBLE**

This course has been designed for students to learn and understand

- Fundamental concept of data structure with effective utilization of space and time
- Linear and nonlinear data structures
- Different Searching, Sorting and Hashing techniques

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the fundamentals of data structures and algorithmic complexity | K2 |
| CO2 | Demonstrate the operations of Stack and Queue and their applications | K2 |
| CO3 | Implement operations on linked list and its variants | K3 |
| CO4 | Apply non linear data structures such as trees and graphs in problem solving | K3 |
| CO5 | Analyze the various sorting, searching algorithms and hashing techniques | K4 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | | |
| CO2 | ✓ | ✓ | ✓ | | |
| CO3 | ✓ | ✓ | ✓ | | |
| CO4 | ✓ | ✓ | ✓ | | |
| CO5 | ✓ | ✓ | ✓ | | |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human Values/ Ethics |

| 234CA1A2CA | DATA STRUCTURES | SEMESTER II |
|---|---|---|

**Total Credits:** 4

**Total Instruction Hours:** 60 h

## Syllabus

**Unit I** Introduction to Data Structures and Arrays 10 h

Introduction: Basic Terminology -Classification of Data Structures -Operations on Data Structures-Abstract Data Type-Algorithms-Time and Space Complexity -Big O Notation-Omega Notation (Ω) -Theta Notation (Φ). Arrays: Declaration of Arrays-Accessing the elements of an array-Storing values in Arrays-Operations on Arrays. Applications of Arrays: Sparse Matrices

**Unit II** Stacks and Queues 12 h

Stacks: Array Representation of Stacks- Operations on a Stack-Linked Representation of Stacks. Applications of Stacks: Evaluation of Arithmetic Expressions –Recursion. Queues: Array Representation of Queues - Operations on Queues -Linked Representation of Queues - Circular Queues. Applications of Queues: JOB Scheduling

**Unit III** Linked Lists 12 h

Singly Linked Lists: Inserting a node in a Linked List- Deleting a node from a Linked List. Circular Linked Lists: Inserting a node in a Circular Linked List - Deleting a node from a Circular Linked List. Doubly Linked Lists: Inserting a node in a Doubly Linked List - Deleting a node from a Doubly Linked List. Applications of Linked Lists: Polynomial Addition

**Unit IV** Trees and Graphs 14 h

Trees: Binary Trees – Representation of Binary Trees -Creating a Binary Tree - Traversing a Binary Tree- Binary Search Trees and its Operations - Threaded Binary Trees. Applications of Trees: Expression Trees. Graphs: Graph Terminology - Representation of Graphs - Graph Traversal Algorithms.Applications of Graphs: Shortest Path Algorithm: Dijkstra's Algorithm. Minimum Spanning Trees : Prim's Algorithm

**Unit V** Searching , Sorting and Hashing 12 h

Searching: Linear search –Binary Search. Sorting: Bubble Sort - Insertion Sort - Selection Sort – Quick Sort-Merge Sort -Heap Sort. Hashing and Collision: Hash Tables - Hash Functions - Collision. Applications of Hashing: Keyword Table in a Compiler.

**Text Books**


1 Reema Thareja, 2018, "Data Structures using C", Second Edition, Oxford University Press.

2 G A V Pai, 2017, "Data Structures and Algorithms: Concepts - Techniques and Applications",McGraw Hill Education.


**References**


1 Mark Allen Weiss, 2014, "Data Structures and Algorithm Analysis in C++", Third Edition , Pearson education.

2 YashavantKanetker, 2003, "Data Structure Through C++ Paperback" ,4th Edition, BPB Publications.

3 Lipchitz (Schaum's Outline Series), 2010,"Data Structures with C", McGraw Hill Education.

4 https://www.tutorialspoint.com/data_structures_algorithms/index.htm

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 234CS1A2CA | OBJECT ORIENTED PROGRAMMING WITH C++ | CORE | 4 | - | - | 4 |

**PREAMBLE**

This course has been designed for students to learn and understand

- The object orientedprogramming principles.
- The structure and features of C++.
- The design and implementation of OOPs concepts using C++.

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Describe the concepts of object oriented programming and basic constructs of C++ programming | K1 |
| CO2 | Design simple applications using classes and objects | K2 |
| CO3 | Illustrate the concept of Inheritance and apply pointers and strings | K3 |
| CO4 | Apply polymorphism and exception handling in program design | K3 |
| CO5 | Implement programs using File Management and STL | K4 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | | |
| CO2 | ✓ | ✓ | ✓ | | |
| CO3 | ✓ | ✓ | ✓ | | |
| CO4 | ✓ | ✓ | ✓ | | |
| CO5 | ✓ | ✓ | ✓ | | |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human Values/ Ethics |

| 234CS1A2CA | OBJECT ORIENTED PROGRAMMING WITH C++ | SEMESTER II |
|---|---|---|

**Total Credits:** 4

**Total Instruction Hours:** 48 h

## Syllabus

**Unit I** Introduction to Object Oriented Programming 8 h

Introduction - Programming Paradigms - Key concepts of Object-Oriented Programming – Applications of Object-Oriented Programming - Variable, Value and Constant - Components of a C++ Program - Data Types - Expressions - Type Conversion - Order of Evaluation - Formatting Data: Manipulators in Input/Output- Branching and Looping.

**Unit II** Classes and Arrays 10 h

User-Defined Types: Classes-Class Definition-Member function- Access Modifiers- Inline function- Constructors and Destructors- Instance Members: Instance Data Members-Instance Member Functions -Static Members - Arrays: One-Dimensional Arrays - Multidimensional Arrays. Case Study: Wave Array

**Unit III** Pointers, Strings and Inheritance 10 h

References - Pointers - Pointer Types and Pointer variables - Constant Modifiers – Pointer to Pointer- Arrays and Pointers - Strings: C ++ String Class -C++ String Library – Inheritance: Private, Public and Protected Inheritance - Association - Dependency

**Unit IV** Polymorphism and Exception Handling 10 h

Polymorphism- Binding- Abstract Class : Pure Virtual Functions - Multiple Inheritance - Overloading Principles - Overloading as Member- Nonmember: Friend function-Exception Handling : Approach- Exceptions in Classes - Standard Exception Classes – Templates: Function Template - Class Template.

**Unit V** File Handling and Standard Template Library 10 h

Input and Output stream – Stream Classes - Console Streams - Console Objects - Stream State - File Streams - File I/O - Opening Modes - Sequential Vs Random Access - String Streams - Formatting Data: Direct use of Flags, Fields and Variables - Predefined Manipulators-Standard Template Library: Iterators, Sequence Containers, Container Adapters.

**Text Books**


1. Ashok Kamthane, 2017, "Object-Oriented Programming with ANSI and Turbo C++ 3rd Edition", Pearson (Unit 1.1 to 1.3).
2. Behrouz A. Forouzan, Richard F. Gilberg, 2020, "C++ Programming: An Object-Oriented Approach", McGraw-Hill Education (Unit I to V).


**References**


1. Bjarne Stroustrup, 2022, "C++ Programming Language, Fourth Edition" Pearson.
2. E Balagurusamy, 2020, "Object-Oriented Programming with C++, 8th Edition", McGraw Hill Education
3. M. Ashwin, V. Sreeprada, M. Santhosh, 2022, "A Hand Book on C++ Programming", Notion Press
4. YashavantKanetkar, 2020, "Let Us C++", BPB Publications.
5. https://www.codecademy.com/
6. https://www.simplilearn.com/

| 234DA1A2CP | DATA STRUCTURES AND C++ | SEMESTER II |
|---|---|---|

**Total Credits:** 2
**Total Instructions Hours:** 48 h

| S.No | Contents |
|---|---|
| 1 | Program for implementing classes and objects |
| 2 | Program for implementing constructors and destructors |
| 3 | Program for implementing inheritance |
| 4 | Program to perform exception handling |
| 5 | Program to implement overloading |
| 6 | Program to implement virtual functions |
| 7 | Program to perform Push, Pop, Display operations in Stack |
| 8 | Program to convert infix expression to postfix expression using Stack |
| 9 | Program to perform insertion, deletion and display in Queue |
| 10 | Program to perform Linked list operations |
| 11 | Program to perform Searching |
| 12 | Program to implement Sorting |

**Note:** Out of 12 programs 10 are mandatory.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 232MT1A2ID | MATHEMATICS FOR COMPUTING - II | IDC | 4 | 1 | - | 4 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the concepts of probability theory and distribution
- the method of finding the moments of a random variable
- the method of checking the validity of parameters through test statistic

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | state the basic concepts of probability theory | K1 |
| CO2 | discuss the concept of discrete and continuous distribution | K2 |
| CO3 | define the parameters of central tendencies and dispersion. | K2 |
| CO4 | demonstrate the applications of correlation and regression | K3 |
| CO5 | analyze the validity of the values of parameters through hypothesis testing | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | | | ✓ |
| CO2 | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | |
| CO4 | ✓ | ✓ | ✓ | ✓ | |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human Values/ Ethics |

| 232MT1A2ID | MATHEMATICS FOR COMPUTING - II | SEMESTER II |
|---|---|---|

**Total Credits:** 4

**Total Instruction Hours:** 60 h

## Syllabus

**Unit I** Elementary probability and Random variable 11 h

Random experiment - De-Morgan's laws - conditional probability - generalization of multiplicative law - Bayes' probabilities - random variable - discrete and continuous random variable - distribution function - discrete probability distribution and function - mathematical expectation - moments - moment generating function - characteristic function - cumulants.

**Unit II** Probability Distribution 12 h

Binomial distribution - Bernoulli's theorem - Poisson distribution and Poisson variate X - relationship between the probabilities, P(X=x) and P(X=x+1) - hypergeometric distribution - normal and lognormal distribution - Beta, Gamma and Exponential distribution - Weibull distribution

**Unit III** Measures of Central tendency and Dispersion 13 h

Characteristics of a good measure of central tendency - mean - arithmetic Mean - pooled mean - geometric Mean - harmonic mean - median - mode.

Measures of dispersion - purposes - properties - range - interquartile range – mean deviation - variance - standard deviation - coefficient of variation.

**Unit IV** Correlation and Regression 12 h

Scatter diagram - least square method - properties - regression line of X on Y- regression coefficient from coded data - correlation methods - graphical method - correlation coefficient - correlation in grouped bivariate data - relationship between correlation coefficients and regression coefficients - rank correlation.

**Unit V** Test of Significance and t- Test 12 h

Types of hypothesis -two types of errors - level of significance - critical region - one and two tailed test - size and power of a test - randomized test -non randomized test - degrees of freedom - student's t- test - test of equality of two population means - paired t- test - interval estimation - large sample tests - tests of hypothesis for proportions.

Note: Distribution of Marks 80% Problem and 20% Theory

**Text Books**

1 Agarwal B. L, 2013, "Basic Statistics", 6th edition, New age International (P) Limited publishers, New Delhi.

**References**

1 Gupta C.B and Vijay Gupta, 2007, "An Introduction to Statistical Methods", 23rd edition, S.Chand & Co, New Delhi.

2 Sanchetti, D.C. Kapoor, V.K, 2010, "Statistics", 7th edition, S.Chand & Co, New Delhi.

3 Veerarajan. T, 2017, "Fundamentals of Mathematical Statistics", 1st edition, Yes Dee Publishing Pvt Ltd, Chennai.

4 Sivaramakrishna Das.P, Vijayakumar.C, 2020, "Probability and Statistics", 2nd Edition, Pearson Education, Noida.

| 231TL1A2AA | PART- IV: BASIC TAMIL | SEMESTER II |
|---|---|---|

**Total Credits:** 2

**Total Instruction Hours:** 24 h

**இளங்கலை 2023–24ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது**

**(10 மற்றும் 12– ஆம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு)**

**(பருவத் தேர்வு இல்லை)**

**Syllabus**

**Unit I** **தமிழ் மொழியின் அடிப்படைக் கூறுகள்** 05 h

எழுத்துகள் அறிமுகம்

1. உயிர் எழுத்துக்கள் - குறில் , நெடில் எழுத்துகள்

2. மெய் எழுத்துக்கள் - வல்லினம், மெல்லினம், இடையினம்

3. உயிர்மெய் எழுத்துக்கள்

4. பயிற்சி

**Unit II** **சொற்களின் அறிமுகம்** 05 h

1.பெயர்ச்சொல்

2.வினைச்சொல் – விளக்கம் (எ.கா.)

3.பயிற்சி

**Unit III** **குறிப்பு எழுதுதல்** 05 h

1. பெயர், முகவரி, பாடப்பிரிவு , கல்லூரியின் முகவரி

2. தமிழ் மாதங்கள்(12), வாரநாட்கள்(7)

3. எண்கள் (ஒன்று முதல் பத்து வரை), வடிவங்கள், வண்ணங்கள்

**Unit IV** **குறிப்பு எழுதுதல்** 05 h

1. ஊர்வன, பறப்பன, விலங்குகள்

2.மனிதர்களின் உறவுப்பெயர்கள்

3. ஊர்களின்பெயர்கள் (எண்ணிக்கை 10)

**Unit V** **பயிற்சிப் பகுதி** 04 h

**பயிற்சிப் பகுதி (உரையாடும் இடங்கள்)**

வகுப்பறை, பேருந்து நிலையம், சந்தை– பேசுதல்,எழுதுதல்.

## Notes:

**அகமதிப்பீட்டுத்தேர்வு– வினாத்தாள் அமைப்புமுறை- மொத்த மதிப்பெண்கள் - 50**

| | | |
|---|---|---|
| | | **பகுதி –அ** |
| சரியான விடையைத் தேர்வு செய்தல் | 10 | x2=20 |
| | | **பகுதி –ஆ** |
| சரியா? தவறா? | | 10x2=20 |
| | | **பகுதி – இ** |
| ஒரு பக்க அளவில் விடையளிக்க | | 1x10=10 |

குறிப்பு:

- அனைத்து அலகுகளில் இருந்தும் வினாக்கள் அமைதல் வேண்டும்
- பகுதி இ–க்கான வினாக்கள் இதுஅல்லது அதுஎன்ற அடிப்படையில் அமைதல் வேண்டும்

## Text Book

1 அடிப்படைத் தமிழ் - 2023-2024,தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி,கோயம்புத்தூர்.வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை. (Unit I to IV)

## References

1 ஒன்றாம் வகுப்பு பாடநூல் - தமிழ்நாடு அரசு பாடநூல் கழகம், சென்னை.

2 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY வலைதள முகவரி: <https://www.tamilvu.org/>

| 231TL1A2AB | PART- IV: ADVANCED TAMIL | SEMESTER II |
|---|---|---|

**Total Credits:** 2

**Total Instruction Hours:** 24 h

**இளங்கலை 2023– 2024 ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது**

**(10 மற்றும் 12– ஆம் வகுப்புகளில் தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு உரியது)**

**(பருவத் தேர்வு இல்லை )**

## Syllabus

**Unit I** **கவிதைகள்** 06 h

1. தமிழ்நாடு - பாரதியார்
2. மனதில் உறுதி வேண்டும் - பாரதியார்
3. இன்பத்தமிழ் - பாரதிதாசன்
4. வேலைகளல்லவேள்விகள் - தாராபாரதி
5. தமிழா! நீ பேசுவது தமிழா! - காசியானந்தன்
6. நட்புக் காலம்(10 கவிதைகள்)- அறிவுமதி கவிதைகள்

**Unit II** **கட்டுரை** 05 h

கட்டுரைத் தொகுப்பு -நல்வாழ்வு - டாக்டர் மு.வரதராசன்

1. நம்பிக்கை
2. புலனடக்கம்
3. பண்பாடு

**Unit III** **இலக்கணம்** 04 h

1. வல்லினம் மிகும் மற்றும் மிகா இடங்கள்
2. ர,ற,ல,ழ,ள,ந,ண,ன – வேறுபாடு அறிதல்

**Unit IV** **கடிதங்கள்** 05 h

1. பாராட்டுக் கடிதம்
2. நன்றிக் கடிதம்
3. அழைப்புக் கடிதம்
4. அலுவலக விண்ணப்பங்கள்

**Unit V** **பயிற்சிப் பகுதி** 04 h

**படைப்பாக்கப் பகுதி**

பொதுத் தலைப்புகளில் கவிதை,கட்டுரை எழுதச்செய்தல்

## Notes

**அக மதிப்பீட்டுத் தேர்வு - வினாத்தாள் அமைப்பு முறை- மொத்த மதிப்பெண்கள் 50**

| | | |
|---|---|---|
| | | பகுதி –அ |
| சரியான விடையைத் தேர்வு செய்தல் | 10 | x1=10 |
| | | பகுதி –ஆ |
| கோடிட்ட இடங்களை நிரப்புக. | | 10x2=20 |
| | | பகுதி –இ |
| இரண்டு பக்க அளவில் விடையளிக்க | | 2x10=20 |

குறிப்பு:

- அனைத்து அலகுகளில் இருந்தும் வினாக்கள் அமைதல் வேண்டும்
- பகுதி இ–க்கான வினாக்கள் இதுஅல்லது அதுஎன்ற அடிப்படையில் அமைதல் வேண்டும்

## Text Book

1 சிறப்புத் தமிழ் - 2023-2024, தொகுப்பு: தமிழ்த்துறை , டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, கோயம்புத்தூர். வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை. (Unit- I to IV)

## References


1 பேராசிரியர் புலவர் சோம. இளவரசு ,எட்டாம் பதிப்பு. 2014 . தமிழ் இலக்கிய வரலாறு – மணிவாசகர் பதிப்பகம்,சென்னை.

2 டாக்டர் மு.வரதராசன். 2010. நல்வாழ்வு, பாரி நிலையம், சென்னை.

3 பேராசிரியர் முனைவர் பாக்கியமேரி ,முதற் பதிப்பு.2013. இலக்கணம் - இலக்கிய வரலாறு - மொழித்திறன்- பூவேந்தன் பதிப்பகம், சென்னை..

4 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY. வலைதள முகவரி : <https://www.tamilvu.org/>

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 235CR1A2AA | HUMAN RIGHTS AND WOMEN'S RIGHTS | AECC | 2 | - | - | 2 |

**PREAMBLE**

This course has been designed for students to learn and understand

- Concepts of Human Rights.
- Human Right Violations and Redressal Mechanism.
- Rights to Women and Child.

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the basic concepts of Human Rights. | K1 |
| CO2 | Describe the Fundamental Rights. | K2 |
| CO3 | Relate Human Right Violations and Redressal Mechanism. | K3 |
| CO4 | State the Rights to Women and Child. | K2 |
| CO5 | Apply Civil and Political Rights of Women. | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | | ✓ | | ✓ | ✓ |
| CO2 | | ✓ | ✓ | ✓ | ✓ |
| CO3 | | | | ✓ | ✓ |
| CO4 | | ✓ | | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ |

| | | | |
|---|---|---|---|
| | Skill Development | | Entrepreneurial Development |
| | Employability | | Innovations |
| | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 235CR1A2AA | HUMAN RIGHTS AND WOMEN'S RIGHTS | **SEMESTER II** |
|---|---|---|

**Total Credits:** 2

**Total Instruction Hours:** 24 h

## Syllabus

**Unit I** Introduction to Human Rights 04 h

Meaning - Definition - Nature - Content - Legitimacy of Human Rights - Origin and Development of Human Rights - Theories - Principles of Magna Carta - Modern Movements of Human Rights - The Future of Human Rights. Case studies related to human rights.

**Unit II** Human Rights in India 05 h

The Constitution of India: Fundamental Rights - Right to Life and Liberty - Directive Principles of State Policy - Fundamental Duties - Individual and Group Rights - Other facets of Human Rights - Measures for Protection of Human Rights in India.

**Unit III** Human Right Violations and Redressal Mechanism 05 h

Human Rights: Infringement of Human Right by State Machinery and by Individual - Remedies for State action and inaction - Constitutional Remedies - Public Interest Litigation (PIL) - Protection of Human Rights Act, 1993 - National Human Rights Commission - State Human Rights Commissions - Constitution of Human Right Courts.

**Unit IV** Rights to Women and Child 05 h

Matrimonial protection - Protection against dowry - Protection to pregnancy - Sexual offences - Law relating to work Place - Directive principles of Constitution (Article 39 a, d, e & Article 42, 43 & 46) - Trafficking of women - Constitutional Rights - Personal Laws - Protection of children against Sexual Offences Act, 2012 (POCSO).Case studies related toSexual offences.

**Unit V** Civil and Political Rights of Women 05 h

Right of Inheritance - Right to live with decency and dignity - The Married women's Property Act, 1874 - Women's right to property - Women Reservation Bill - National Commission for Women - Political participation -Pre-independent political participation of women - Participation of Women in post independent period. Kavalan App.Case studies related to women rights.

**Text Books**

1 Lalit Parmar, 1998, "Human Rights", Anmol Publications Pvt. Limited, New Delhi.

2 Krishna Pal Malik, 2009, "Women & Law ", Allahabad Law University, New Delhi.

**References**

1 Mandagadde Rama Jois, 2015, "Human Rights", Bharatiya Values, Bharatiya Vidya Bhavan Publications, Mumbai.

2 Paras Diwan and Piyush Diwan, 1994, "Women and Legal Protection", South Asia Books, Andhra Pradesh.

3 Venkataram and Sandhiya. N, 2001, "Research in Value Education", APH Publishing Corporation, New Delhi.

4 Anand A S, 2008, "Justice for Women: Concerns and Expressions", Universal Law Publishing Co., New Delhi.

16/10/23
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| BoS- 9th | AC - 16th | GB - 21st |
|---|---|---|
| 16.10.23 | 13.12.23 | 05.01.24 |

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| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A3TA | TAMIL- III | LANGUAGE- I | 3 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடுநாகரீகம்,பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | வாழ்க்கைத்திறன்கள் (Life Skills)- மாணவர்களின் செயலாக்கத்திறனை ஊக்குவித்தல் | K1 |
| CO2 | மதிப்புக்கல்வி (Attitude and Value education) | K2 |
| CO3 | பாடஇணைச்செயல்பாடுகள் (Co-curricular activities) | K2 |
| CO4 | சூழலியல் ஆக்கம் (Ecology) | K3 |
| CO5 | மொழி அறிவு(Tamil knowledge) | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | | |
| CO2 | | | | ✓ | |
| CO3 | | ✓ | | | |
| CO4 | ✓ | | ✓ | | |
| CO5 | ✓ | | | ✓ | |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A3TA | TAMIL- III | SEMESTER III |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 48 h

**Syllabus**

**Unit I காப்பியங்கள்** 10 h

1.சிலப்பதிகாரம் -வழக்குரை காதை

2. மணிமேகலை-ஆதிரை பிச்சையிட்ட காதை

**Unit II காப்பியங்கள்** 10 h

1. கம்பராமாயணம் -கும்பகர்ணன் வதைப்படலம்: பா. எண் : 60 முதல் – 100 வரை

2. பெரிய புராணம் - அதிபத்த நாயனார்புராணம்

**Unit III சிற்றிலக்கியங்கள்** 10 h

1.திருக்குற்றாலக்குறவஞ்சி - வசந்தவல்லி பந்தாடிய சிறப்பு (6: 4கண்ணிகள்)

2.கலிங்கத்துப்பரணி-களம்பாடியது: போர்க்களக் காட்சி- பா.எண்: 472 முதல்- 502 வரை

**Unit IV இலக்கிய வரலாறு** 10 h

1.காப்பியம் – வரையறை,ஐம்பெருங் காப்பியங்கள்,ஐஞ்சிறு காப்பியங்கள்

2.கம்பராமாயணம், பெரிய புராணம் – குறிப்பு

3. சிற்றிலக்கியங்களின் தோற்றமும் வளர்ச்சியும்

**Unit V இலக்கணம் &பயிற்சிப் பகுதி** 08 h

அ. இலக்கணம்

1.'பா' வகைகள் : வெண்பா, ஆசிரியப்பா, கலிப்பா, வஞ்சிப்பா - பொது இலக்கணம் மட்டும்.

2. அணி: உவமையணி, உருவக அணி, இல்பொருள் உவமையணி விளக்கம், உதாரணம்.

ஆ. பயிற்சிப் பகுதி

1.வாசகர் கடிதம்: நாளிதழ், வானொலி, செய்தி ஊடகங்களுக்கு விமர்சனம் எழுதுதல்

2.திரைக்கதை விமர்சனம்: மத்திய மற்றும் மாநில அரசு விருது பெற்ற தமிழ்த் திரைப்படங்கள் மட்டும்

**Text Book**

1 தமிழ் மொழிப்பாடம்-2023 -2024 ,தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி,கோயம்புத்தூர். வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை. (Unit I to V)

**References**

1 பேராசிரியர் புலவர் சோம. இளவரசு,எட்டாம் பதிப்பு-2014,தமிழ் இலக்கிய வரலாறு- மணிவாசகர் பதிப்பகம்,சென்னை.

2 பேராசிரியர் முனைவர் பாக்கியமேரி,முதற் பதிப்பு- 2013,இலக்கணம்-இலக்கிய வரலாறு- மொழித்திறன்- பூவேந்தன் பதிப்பகம்,சென்னை. .

3 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY. வலைதள முகவரி: https://www.tamilvu.org

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A3HA | HINDI- III | LANGUAGE- I | 3 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- the techniques for expansion of ideas and translation process

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the fundamentals of novels and stories | K1 |
| CO2 | Understand the principles of translation work | K2 |
| CO3 | Expose the knowledge writing critical views on fiction | K2 |
| CO4 | Build creative ability | K3 |
| CO5 | Apply the power of creative reading | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | ✓ | ✓ |
| CO2 | | ✓ | | | ✓ |
| CO3 | ✓ | | ✓ | ✓ | |
| CO4 | | | | | ✓ |
| CO5 | ✓ | ✓ | ✓ | | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A3HA | HINDI- III | SEMESTER III |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 48 h

## Syllabus

**Unit I** 10 h

पद्य – काव्य पराशर (भोलानाथ)

(प्राचीन- कबीर, तुलसी, सुर, मीरा, आधुनिक- मैथिलीशरण गुप्त, अरूण कमल )

**Unit II** 10 h

हिन्दी साहित्य का इतिहास: (साधारण ज्ञान)

**Unit III** 10 h

अलंकार:अनुप्रास,यमक, श्लेष, वक्रोक्ति, उपमा,रूपक

**Unit IV** 10 h

संवादलेखन

**Unit V** 08 h

अनुवादअभ्यास-III (केवलहिन्दीसेअंग्रेजीमें)

(पाठ10 to 20)

**Text Books**

1 प्रकाशक: जवाहर पुस्तकालय सदर बाजार, मथुराउत्तर प्रदेश-281001(Unit I)

2 आचार्य रामचन्द्र शुक्ललोकभारती प्रकाशन इलाहाबाद. (Unit II)

3 प्रकाशक: विनोद पुस्तक मंदिरआगरा-282002 (Unit III)

4 पुस्तक: व्याकरणप्रदिप–रामदेवप्रकाशक: हिन्दीभवन36 इलाहाबाद-211024(Unit IV)

5 प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई -17(Unit V)

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A3MA | MALAYALAM- III | LANGUAGE-I | 3 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the fundamentals of novels and stories | K1 |
| CO2 | Understand the principles of translation work | K2 |
| CO3 | Expose the knowledge writing critical views on fiction | K2 |
| CO4 | Build creative ability | K3 |
| CO5 | Apply the power of creative reading | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | ✓ | |
| CO2 | ✓ | | | | ✓ |
| CO3 | | ✓ | ✓ | | |
| CO4 | ✓ | | | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | | ✓ |

**COURSE FOCUS ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A3MA | MALAYALAM- III | SEMESTER III |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 48 h

## Syllabus

**Unit I Poetry** 10 h

Kumaranasan

**Unit II Poetry** 10 h

Kumaranasan

**Unit III Poetry** 10 h

Kumaranasan

**Unit IV Poetry** 10 h

VayalarRamavarma

**Unit V Poetry** 08 h

VayalarRamavarma

**Text Books**

1 Kumaranasan. 1998. Chinthavishtayaya Sitha. DC Books Kottayam, Kerala, India.(Unit I to III)

2 Ayisha (Poem), National Book Stall Kottayam, Kerala, India. (Unit IV & V)

**Reference**

1 Dr.M.Leelavathy.Kavitha Sahithya Charithram. Sahithya Academy Thrissur, Kerala, India.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A3FA | FRENCH- III | LANGUAGE- I | 3 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written- Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the Basic verbs, numbers and accents | K1 |
| CO2 | Apply the adjectives and the classroom environment in France | K2 |
| CO3 | Select the Plural, Articles and the Hobbies | K2 |
| CO4 | Measure the Cultural Activity in France | K3 |
| CO5 | Evaluate the sentiments, life style of the French people and the usage of the conditional tense | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | | ✓ |
| CO2 | ✓ | ✓ | | | |
| CO3 | | | ✓ | ✓ | |
| CO4 | ✓ | ✓ | | | ✓ |
| CO5 | ✓ | | ✓ | ✓ | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A3FA | FRENCH- III | SEMESTER III |
|---|---|---|

**Total Credits:** 3
**Total Instruction Hours:** 48 h

## Syllabus

**Unit I** 10 h

| | | | |
|---|---|---|---|
| ° Décrireun lieu.<br>° Situer | A partird'unerecherche de documents, composer une presentation touristique pour un magazine ou un site internet. | Comprehendre la description d'un lieu.<br>Décrireunevilleouunerégionq u'onaime.<br>Interrogersur la situation of d'un lieu.<br>Comprendre des indications sur la fréquenced'actions. | Comprendreune presentation de catalogue touristique.<br>Comprendre des pictogrammes.<br>Comprendre la description d'un lieu et d'une situation precise dans un message électronique. |

**Unit II** 10 h

| | | | |
|---|---|---|---|
| Se situerdans le temps. | A partird'unerecherc he de documents, composer une presentation touristique pour un magazine ou un site internet. | Comprehendre la description d'un lieu.<br>Décrireunevilleouunerégio nqu'onaime.<br>Interrogersur la situation of d'un lieu.<br>Comprendre des indications sur la fréquenced'actions. | Comprendreune presentation de catalogue touristique.<br>Comprendre des pictogrammes.<br>Comprendre la description d'un lieu et d'une situation precise dans un message électronique. |

**Unit III** 10 h

| | | | |
|---|---|---|---|
| Raconter.<br>° Décrire les étapesd'une action. | Raconterune scene insolite à l'oreal et à l'écrit. | Comprehendre le récit d ún voyage.<br>Raconterses actions quotidiennes. | Ecrire une biographie a partir d'eléments écrits. |

**Unit IV** 10 h

| | | | |
|---|---|---|---|
| Exprimer l'intensité et la quantité.<br>° Interroger. | Raconterune scene insoliteà l'oreal et à l'écrit. | Comprehendre le récit d ún voyage.<br>Raconterses actions quotidiennes. | Ecrire une biographie a partir d'eléments écrits. |

**Unit V** 08 h

| |
|---|
| Make in Own Sentences based on the above Lessons |

**Text Book**

1 LATITUDES 1 (Méthode de français) Pages from 102-127, Author : ReginеMérieux, Yves Loiseau( Unit I to IV)

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231EL1A3EA | ENGLISH - III | LANGUAGE- II | 3 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the basics of English grammar and specific usage
- the importance of the vocabulary and its use in different contexts
- the necessity of communication and composition writing skills

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Infer the specific usage of while-listening process | K2 |
| CO2 | Organize the various abilities and sub-skills involved in reading | K3 |
| CO3 | Utilize the importance of speaking skills and developing it through various practices | K3 |
| CO4 | Master diverse business communication formats and skills | K4 |
| CO5 | Acquire all-round mature outlook to function effectively in different context | K4 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | | | ✓ | | ✓ |
| CO2 | ✓ | ✓ | | ✓ | |
| CO3 | ✓ | | ✓ | | ✓ |
| CO4 | ✓ | | ✓ | | |
| CO5 | | ✓ | | ✓ | |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | ✓ | Gender Sensitization |
| ✓ | Social Awareness/ Environment | ✓ | Constitutional Rights/ Human Values/ Ethics |

| 231EL1A3EA | ENGLISH - III | SEMESTER III |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 48 h

## Syllabus

**Unit I** Listening and Reading 09 h

Listening in casual conversation, Small group and Conference setting - Listening for Factual Information- Barriers of Listening- Developing Listening skills- Poor listening vs Effective Listening - Basics of Reading- Efficient and Inefficient Readers- Advantages of Reading- Four Basic steps of Effective Reading- Stumbling blocks in becoming an effective Reader- Strategies for Comprehending and Retaining content- Effective Note Taking while Reading

**Unit II** Speaking 09 h

Purpose of General Conversations- Advantages, Features of a good conversation- Tips for improving Conversation- Public Speaking- Importance of Public Speaking- Benefits, Tips, Overcoming fear of Public Speaking- Preparatory steps - Structuring the contents- Audience Awareness- Mode of Delivery

**Unit III** Writing Skills 10 h

Preparing an Effective CV or a Resume with Job Applications- Employers expectation - Organize the material– Useful suggestions- Cover Letter- Content to be included– Tone of the letter- Report Writing- importance– features- Types – main parts– Feasibility report– Accident report- Scientific report- Memos – Introduction– Structure- Proposal Writing

**Unit IV** English for Communication & Skill for Employment 12 h

Notices, Agendas and Minutes- Business correspondence- Speeches- Meetings, Vocabulary Development- Editing Skills, and Reference Skills- Reading and Replying to E-Mails- Making Presentations- Interview Techniques- Group Discussion, and Oral Presentation Skills- Interacting with Superiors, and Listening to Reports and Customer Complaints- Preparing the minutes of a meeting- Presenting Data in Verbal and Non-verbal modes- The Correct Attitude of Employment

**Unit V** Soft Skills 08 h

Importance of soft skills- Attributes- Social Skills- Thinking- Negotiating- Exhibiting- Identifying - Soft Skills training -Train Yourself- Practicing soft skills- Measuring attitude – Self-Discovery: Importance of knowing yourself- Process - SWOT analysis – Benefits – Usage – SWOT Analysis grid- Art of Negotiation

## Text Books


1. Camp and Satterwhite. 1998. College English and Communication. 7th Edition Glencoe Mchrawttill Publishers, New York, Unites States of America. (Unit I, II, III)
2. Kumar, Sanjay and Lata Pushp. 2018. Language and Communication Skills for Engineers. First Edition, Oxford University Press, India. (Unit I, II, III)
3. Mohan, Krishna and Banerji, Meera. 2009. Developing Communication skills. 2nd Edition, Macmillcan, India. (Unit I, II, III, IV)
4. Alex. Soft Skills. 2009. S. Chand Publishing, New Delhi, India. (Unit V)


## References


1. Ghosh, B.N. Editor. 2017. Managing Soft Skills for Personality Development. McGraw- Hill Education, Chennai, India.
2. Miles Craven. 2008. Cambridge English Skills Real Listening and Speaking. First Edition, Cambridge University Press, United Kingdom.
3. Mishra, Gauri and Ranjana Kaul.2016. Language Through Literature. Primus Books, India.
4. Pillai G, Radhakrishna. 2000. English for Success. Emerald Publishers, Chennai, India.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 234DA1A3CA | DATABASE SYSTEM CONCEPTS | CORE | 4 | - | - | 4 |

**PREAMBLE**

This course has been designed for students to learn and understand

- Fundamentals of database design
- Concepts using relational data model
- Introduction to NoSQL

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the basic concepts of database | K2 |
| CO2 | Apply SQL queries for a given context in relational database | K3 |
| CO3 | Apply the knowledge of relational database design | K3 |
| CO4 | Analyze storage techniques and transaction management | K4 |
| CO5 | Apply the distributed database concepts and NOSQL database | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | | |
| CO2 | ✓ | ✓ | ✓ | | |
| CO3 | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | | |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human Values/ Ethics |

| 234DA1A3CA | DATABASE SYSTEM CONCEPTS | **SEMESTER** III |
|---|---|---|

**Total Credits:** 4

**Total Instruction Hours:** 48 h

## Syllabus

**Unit I** Relational Databases 8 h

Introduction to the Relational Model - Structure - Database Scheme - Keys - Schema Diagrams - Relational Query Languages - Relational Operations. Introduction to SQL: Overview of the SQL Query Language- SQL Data Definition - Basic Structure - Additional Operations - Set Operations - Null Values - Aggregate Functions - Nested Subqueries

**Unit II** Intermediate and Advanced SQL 10 h

Intermediate SQL: Join Expressions - Views - Transactions - Integrity Constraints - SQL Data Types and Schemas - Authorization. Advanced SQL: Accessing SQL From a Programming Language - Functions and Procedures - Triggers - Recursive Queries - Advanced Aggregation Features - Online Analytical Processing

**Unit III** Database Design 10 h

Database Design and the E-R Model: Overview of the Design Process - Entity-Relationship Model - Constraints - Removing Redundant Attributes - Entity-Relationship Diagrams - Reduction to Relational Schemas - Entity-Relationship Design Issues - Extended E-R Features. Relational Database Design: Features - Atomic Domains and First Normal Form - Second and Third Normal Forms- Decomposition using Functional Dependencies - Boyce Codd Normal Form (BCNF).

**Unit IV** Transaction Management 10 h

Transactions: Transaction Concept - A Simple Transaction Model - Storage Structure - Transaction Atomicity and Durability - Transaction Isolation - Serializability - Transaction Isolation and Atomicity - Transaction Isolation Levels - Implementation - Transactions as SQL Statements. Concurrency Control: Lock-Based Protocols - Deadlock Handling - Timestamp-Based Protocols - Validation-Based Protocols.

**Unit V** Modern Databases 10 h

Distributed Databases: Homogeneous and Heterogeneous Databases - Distributed Data Storage - Distributed Transactions - Distributed Query Processing. NoSQL

Databases: Introduction - Column Oriented Stores - Key/Value Stores - Document Databases - Graph Databases - CRUD Operations

**Text Books**


1 A.Silberchartz, H.F.Korth, S.Sudarshan (2019), "Database System concepts", (7th Edn.), Mc Graw Hill. (Unit I - IV)

2 Shashank Tiwari (2011), "Professional NoSQL", John Wiley & Sons, Inc. (Unit V)


**References**


1 Nilesh Shah, 2005, "Database Systems Using Oracle : A Simplified Guide to SQL and PL/SQL", Second Edition, Pearson Education

2 Raghuram Krishnan, Johnanes Gehrke,(2011), "Database Management System", (3rd Edn.), Mc Graw Hill

3 O`neil Patricand, O`neil Elizabeth,(2008), "Database Principles, Programming and Performance", (2nd Edn.), Margon Kaufmann Publishers Inc

4 Elmasri Ramez and Navathe Shamkant.B, (2010), "Fundamentals of Database System Concepts", (6th Edn.), Addison Wesley

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 234CS1A3CA | OPERATING SYSTEMS | CORE | 3 | - | - | 3 |

PREAMBLE

This course has been designed for students to learn and understand

- The operations performed by OS as resource manager
- The various logical aspects of scheduling various processes
- The mechanisms in memory and Storage management.

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the role of operating systems with its functions and services. | K2 |
| CO2 | Compute the waiting time and turnaround time using different process scheduling algorithms | K3 |
| CO3 | Illustrate the methods for handling and preventing deadlocks | K3 |
| CO4 | Apply the various mechanisms involved in contemporary OS | K3 |
| CO5 | Allocate an deallocate memory space in secondary storages using scheduling methods | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | | ✓ | ✓ |
| CO2 | ✓ | ✓ | ✓ | | ✓ |
| CO3 | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO5 | ✓ | ✓ | | ✓ | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human Values/ Ethics |

| 234CS1A3CA | OPERATING SYSTEMS | SEMESTER V |
|---|---|---|

**Total Credits:** 3
**Total Instruction Hours:** 36 h

## Syllabus

Unit I Introduction to Operating Systems 6 h

Computer System Organization - Computer System Architecture - Operating System Structure - Distributed Systems - Open Source Operating Systems – Operating System Generation.

Unit II Process Scheduling 8 h

Process Concepts - Operations on Processes. Basic Concepts - Scheduling Criteria - Scheduling Algorithms: First-Come First-Served Scheduling - Shortest-Job-First Scheduling - Priority Scheduling - Round-Robin Scheduling - Multilevel Queue Scheduling. Synchronization: Background - The Critical - Section Problem - Semaphores.

Unit III Deadlocks 8 h

Deadlocks: Deadlock Characterization - Methods for Handling Deadlock - Deadlock Prevention - Deadlock Avoidance: Safe State - Resource-Allocation Graph Algorithm - Banker's Algorithm - Deadlock Detection - Recovery from Deadlock.

Unit IV Memory Management 8 h

Memory Management: Swapping - Contiguous Memory Allocation - Paging – Structure of Page Table - Segmentation. Virtual Memory: Demand Paging - Page Replacement: Basic Page Replacement - FIFO Page Replacement - Optimal Page Replacement - LRU Page Replacement.

Unit V Storage Management 6 h

Secondary-Storage Structure : Disk Structure - Disk Scheduling: FCFS Scheduling - SSTF Scheduling SCAN Scheduling-C-SCAN Scheduling-LOOK Scheduling-Selection of a Disk Scheduling Algorithm - RAID structure.

Case Studies: Linux System, Mobile Operating System.

**Text Books**

1 Silberschatz , Galvin , Gagne, 2018, "Operating System Concepts", 9th Edition, Wiley.

**References**

1 Andrew S. Tanenbaum, 2018,"Modern Operating Systems 4e", Pearson Education India.

2 Mukesh Singhal, Niranjan G. Shivaratri, 2019, "Advanced Concepts in Operaring System", 10th edition, McgrawHill.

3 William Stallings, 2017, "Operating Systems: Internals and Design Principles", 9th Edition, Pearson Education.

4 Herbert Bos, S.Tanenbaum, 2020,"Modern Operating System", 6th Edition Pearson education.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 234AI1A3EP | PROGRAMMING IN JAVA | CORE PRACTICAL | 3 | - | 4 | 5 |

## PREAMBLE

This course has been designed for students to learn and understand

- the object-oriented programming concepts, and apply them in solving problems.
- the implementation of packages and interfaces.
- to design of Graphical User Interface and Collections using Java.

## COURSE OUTCOMES

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the Java Language fundamentals. | K2 |
| CO2 | Develop reusable programs using the concepts of inheritance, polymorphism and interfaces. | K3 |
| CO3 | Apply the exception handling to develop efficient and error free codes. | K3 |
| CO4 | Apply the concepts of multithreading and design event driven GUI and web related applications. | K3 |
| CO5 | Demonstrate the implementation of JDBC and Collection classes. | K3 |

## MAPPING WITH PROGRAMME OUTCOMES

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | | ✓ | |
| CO2 | ✓ | ✓ | | ✓ | ✓ |
| CO3 | ✓ | ✓ | ✓ | | |
| CO4 | ✓ | ✓ | | | |
| CO5 | ✓ | ✓ | | | |

## COURSE FOCUSES ON

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human Values/ Ethics |

| 234AI1A3EP | PROGRAMMING IN JAVA | SEMESTER III |
|---|---|---|

**Total Credits: 5**

**Total Instruction Hours:** 84 h

## Syllabus

**Unit I Java Fundamentals** 17 h

Introduction – Data Types - Variables – Operators - Strings – Input and Output - Control flow – Arrays – Objects and Classes – Static Fields and Methods – Method Parameters – Object Construction.

1 Simple Java programs to demonstrate the use of language fundamentals.

2 Programs to demonstrate the Classes, Objects, and Constructors in Java.

3 Programs to implement the Method and Constructor overloading.

4 Programs to demonstrate the use of Scanner class.

**Unit II Inheritance and Interfaces** 17 h

Classes, Super Classes and Sub Classes - Polymorphism–Casting – Abstract Classes– Interfaces: Properties – Interface Concepts - Lambda Expressions – Inner Classes.

5 Demonstrate Single, Multilevel and Hierarchical Inheritance in Java.

6 Programs to implement Abstract classes with example.

7 Program to implement Interface using extends keyword.

8 Develop programs using static and private inner classes.

**Unit III Exception Handling and Packages** 16h

Dealing with Errors – Catching Exceptions – Tips for using Exceptions - Packages: Package Names-Class Importation – Static Imports – Adding classes into Packages- Package Access.

9 Study and Implementation of Checked Exceptions.

10 Study and Implementation of Unchecked Exceptions.

11 Programs to demonstrate Packages in Java.

**Unit IV Threads and GUI Programming** 17 h

Introduction to Threads - Thread States – Properties – Synchronization – GUI: Java User Interface Toolkits – Displaying Frames – Displaying Information – Event Handling – API.

12 Program to implement thread using runnable interface.

13 Program to creating multiple threads and setting priorities.

14 Demonstrate the producer-consumer problem.

15 Create a simple GUI application in Java.

**Unit V JDBC and Collections** 17 h

JDBC: Architecture - JDBC - ODBC - Types of Drivers - Components - Interfaces and classes - Steps for querying the database with JDBC. Collections: Java Collections Framework – Interfaces in Collections – Concrete Collections.

16 Programs to implement JDBC connectivity.

17 Programs to demonstrate the interfaces in collections.

18 Programs to implement the concrete collection classes.

**Text Books**

1 Cay S Horstmann, (2020), "Core Java Volume-1 Fundamentals", (11th Edition), Pearson Indian Education Services Pvt. Lt, India.

2 Herbett Schildt, (2014), "Java: The Complete Reference", Ninth Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi.

**References**

1 C. Xavier, (2010), "Programming with JAVA 2", SciTech Publication, Chennai.

2 Paul Deitel and Harvey Deitel, (2015), "Java How to Program", Tenth Edition, Deitel & Associates, Inc Publications.

3 Instructional Software Research and Development (ISRD) Group, (2007), "Introduction to Object Oriented Programming through Java", Tata McGraw- Hill Publishing Company Limited, New Delhi.

| 234DA1A3SP | SEC I : DATABASE SYSTEMS | SEMESTER III |
|---|---|---|

**Total Credits:** 2
**Total Instructions Hours:** 48 h

| S.No | Contents |
|---|---|
| 1 | Create a database and apply the Data Definition Language |
| 2 | SQL Queries to perform the Data Manipulation Language. |
| 3 | Create a database to set various constraints. |
| 4 | SQL Queries to perform expression and Conditions. |
| 5 | Create and implement aggregate functions. |
| 6 | Create and implement types of Joins. |
| 7 | Perform views, synonyms and sequence |
| 8 | Implement Cursors in PL/SQL. |
| 9 | Implement Triggers in PL/SQL. |
| 10 | Handle exceptions in PL/SQL. |
| 11 | Perform CRUD operations in MongoDB |
| 12 | Import and Export files in MongoDB. |

**Note:** Any 10 are Mandatory.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 232MT1A3ID | DISCRETE MATHEMATICS | IDC | 4 | | - | 4 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the logical operators and applications
- the concept of relation and functions.
- the application of graph theory, trees and automata.

## COURSE OUTCOMES

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the concept of set theory | K1 |
| CO2 | Interprets the various optimization problems in the term of relations and functions | K2 |
| CO3 | Identify applications of logical operators | K2 |
| CO4 | Model and solve real world problems using graphs and theory | K4 |
| CO5 | Relate the concept of Finite state automation in practical problems. | K3 |

## MAPPING WITH PROGRAMME OUTCOMES

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | ✓ | | |
| CO2 | ✓ | | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | | |
| CO4 | ✓ | ✓ | ✓ | ✓ | |
| CO5 | ✓ | ✓ | ✓ | ✓ | |

## COURSE FOCUSES ON

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human Values/ Ethics |

| 232MT1A3ID | DISCRETE MATHEMATICS | SEMESTER III |
|---|---|---|

**Total Credits:** 4

**Total Instruction Hours:** 48 h

**Syllabus**

**Unit I** Set Theory 9 h

Set and its elements - set description - types - Venn-Euler Diagrams - set operations and laws of set theory - fundamental products - index and indexed sets - partitions of sets - minsets - countable and uncountable sets - Algebra of sets and duality - computer representation - the inclusion and exclusion principle

**Unit II** Relations and Functions 10 h

Relations: Introduction - cartesian product of sets - binary relations – set operation on relations - types– partial order relation – equivalence relation and classes- Functions: Introduction - types – invertible functions - composition of functions.

**Unit III** Mathematical Logic 10 h

Propositional calculus – basic logical operations - statements generated by a set - conditional statements -converse, inverse and contrapositive statements - biconditional - tautologies - contradiction - contingency - argument - methods of proof - equivalence and implication

**Unit IV** Graph Theory and Trees 10 h

Basic terminology - paths, cycles and connectivity - subgraphs - types - isomorphic and homeomorphic graphs - representation of graphs in computer memory- Eulerian and Hamiltonian graphs - cartesian product - shortest path.

Trees: Properties - binary trees - complete binary tree - tree of an Algebraic expression - traversing binary trees.

**Unit V** Language, Grammar and Automata 9 h

Language: the set theory of strings - languages – regular expressions and regular languages – grammar – finite state machine – finite state automata.

**Note: 20% Theory and 80% Problem**

## Text Books

1 Sharma J.K., 2022, "Discrete Mathematics", 4th Edition, Trinity Press, New Delhi.

## References

1 Tremblay J.P. and Manohar R., 1997, "Discrete Mathematics Structures with Applications to computer science", 2nd Edition, Mc Graw Hill International, New York.

2 Venkataraman M.K, Sridharan N and Chandrasekaran N., 2000, "Discrete Mathematics ", The National publishing Company, Chennai.

3 Kolman B, Busby R.C. and Ross S.C., 2006, "Discrete Mathematical Structures", 5th Edition., Prentice Hall of India Pvt. Ltd., New Delhi.

4 Kenneth H. Rosen., 1999, "Discrete Mathematics and its Applications", 4th Edition, Mc Graw-Hill Professional, New York.

| 234DA1ASSA | DECISION SUPPORT SYSTEMS | **SEMESTER III** |
|---|---|---|

**Total Credit: 1**

## Syllabus

**Unit I** Introduction

Introduction - Evolution of Decision Support Systems(DSS)- Benefits -Users-Decision -Decision process- Types of Decisions- Business Decisions-Information Systems-DSS as Information systems - Models.

**Unit II** Decision Support Systems

DSS Hierarchy : Overview – DSS Types -DSS Architecture -DSS Client/Server Computing - The Internet and Client / Server Computing in DSS

**Unit III** Software Tools

Software Categories - Standard packages - Specialized Tools and Generators-Programming Languages for DSS -DSS User Interfaces

**Unit IV** Group DSS

Group DSS : Need for Group DSS - Group Vs Individual Activities – Types-Groupware- Group DSS in Use Today - Groupware products

**Unit V** Building and Implementation

Decision Support System Development Process - DSS Development Project Participants - The Implementation stage - Implementation Issues - Ethical Issues in DSS Implementation.

## Text Books

1 Efrem G. Mallach,(2002),"Decision Support and Data Warehouse Systems",(1st Edn.),Tata Mcgraw Hill Publishers

## References

1 Marakas, G.M.,(2009),"Decision Support Systems in the 21st century", (2nd Edn), PHI Learning

2 Taylor, J.,(2011),"Decision Management Systems: A Practical Guide to Using Business Rules and Predictive Analytics",IBM Press

| 234DA1ASSB | SOFTWARE TESTING | SEMESTER III |
|---|---|---|

**Total Credit: 1**

## Syllabus

**Unit I** Functional Testing

Introduction- Software failures- Testing Process-Testing terminologies -Limitation of testing- V shaped software lifecycle model. Functional Testing: Boundary Value Analysis - Equivalence Class Testing - Decision Table Based Testing

**Unit II** Structural Testing

Structural Testing and Software verification: Control flow testing- Data flow testing- Slice based testing- Mutation Testing - Verification methods- Software Requirements Specification(SRS) document verification - Source Code Reviews- User Document Verification

**Unit III** Software Testing Activities

Software Testing Activities, Models and Metrics: Levels of testing- Debugging - Software test plan -Software Testing Tools- Software Metrics- Categories of Metrics

**Unit IV** Regression Testing

Test cases and Use cases: Use case diagram and use cases- Generation of test cases from use Cases - Guidelines for generating validity checks - Database Testing- Regression testing - Test cases -Reducing the number of test cases

**Unit V** Testing Methods

Object oriented Testing and Testing the Web: Path Testing - State Based Testing - Class Testing- Web Testing- Functional Testing- User Interface Testing- Usability Testing - Configuration and Compatibility Testing - Security Testing - Performance Testing

**Text Books**

1 SinghYogesh,(2012) "Software Testing",(1st Edn), Cambridge press

**References**

1 Mathur P Aditya,(2008),"Foundations of Software Testing",(1st Edn) Pearson Education.

2 Glenford J. Myers, Corey Sandler,(2011), "The Art of Software Testing", (1st Edn), Wiley

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| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A4TA | TAMIL - IV | LANGUAGE- I | 3 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு நாகரீகம், பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | வாழ்க்கைத் திறன்கள் (Life Skills)- மாணவர்களின் செயலாக்கத் திறனை ஊக்குவித்தல் | K3 |
| CO2 | மதிப்புக்கல்வி (Attitude and Value education) | K4 |
| CO3 | பாட இணைச்செயல்பாடுகள் (Co-curricular activities) | K4 |
| CO4 | சூழலியல் ஆக்கம் (Ecology) | K4 |
| CO5 | மொழி அறிவு (Tamil knowledge) | K5 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | | ✓ | ✓ | | ✓ |
| CO2 | ✓ | | | ✓ | |
| CO3 | | ✓ | | | ✓ |
| CO4 | | | ✓ | | |
| CO5 | ✓ | | | ✓ | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | _ | Entrepreneurial Development |
| ✓ | Employability | _ | Innovations |
| _ | Intellectual Property Rights | _ | Gender Sensitization |
| _ | Social Awareness/ Environment | _ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A4TA | TAMIL - IV | SEMESTER IV |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 48 h

**Syllabus**

**Unit I** **எட்டுத்தொகை** 10 h

1. நற்றிணை – குறிஞ்சித் திணை

I.பா.எண் : 01 – கபிலர்

II.பா.எண் : 88 – நல்லந்துவனார்

III.பா.எண் : 102 – செம்பியனார்

2. குறுந்தொகை – முல்லைத்திணை

I.பா.எண் : 65 – கோவூர்கிழார்

II. பா.எண் : 167 – கூடலூர்கிழார்

மருதத்திணை

I.பா.எண் : 08 – ஆலங்குடி வங்கனார்

II.பா.எண் : 61 – தும்பிசேர்கீரனார்

III.பா.எண் :196 – மிளைக் கந்தன்

நெய்தல் திணை

I.பா.எண் : 57 – சிறைக்குடி ஆந்தையார்

**Unit II** **எட்டுத்தொகை** 08 h

1. கலித்தொகை – பாலைக்கலி

I.பா.எண் : 09 – பெருங்கடுங்கோ

2. அகநானூறு - மருதத்திணை

I.பா.எண் : 86 – நல்லாவூர்கிழார்

3. புறநானூறு - I.பா.எண் : 188 – பாண்டியன் அறிவுடை நம்பி

II.பா.எண் : 192 – கணியன் பூங்குன்றனார்

III.பா.எண் : 279 – ஒக்கூர் மாசாத்தியார்

IV.பா.எண் : 312 – பொன்முடியார்

**Unit III** **பத்துப்பாட்டு** 10 h

1. பட்டினப் பாலை – கடியலூர் உருத்திரங் கண்ணனார் -1முதல் 218 வரிகள் வரை மட்டும்.

**Unit IV** **இலக்கிய வரலாறு** 10 h

1. எட்டுத் தொகை நூல்கள்
2. பத்துப்பாட்டு நூல்கள்

**Unit V** **இலக்கணம் மற்றும் திறனாய்வுப் பகுதி** 10 h

I. இலக்கணம்

1. அகத்திணை – அன்பின் ஐந்திணை - விளக்கம்
2. புறத்திணை – 12 திணைகள் - விளக்கம்

II. பயிற்சிப் பகுதி

சங்கப் பாடல்கள் குறித்து திறனாய்வு செய்தல்.

**Note:** பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது.

**Text Book**

செய்யுள் திரட்டு - மொழிப் பாடம் - 2023- 24

1 தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி,(Unit I - V)

**References**


1 பேராசிரியர் புலவர் சோம. இளவரசு, எட்டாம் பதிப்பு -2014, தமிழ் இலக்கிய வரலாறு - மணிவாசகர் பதிப்பகம், சென்னை.

2 பேராசிரியர் முனைவர் பாக்கியமேரி, முதற் பதிப்பு- 2013, இலக்கணம் -இலக்கிய வரலாறு - மொழித்திறன் -பூவேந்தன் பதிப்பகம், சென்னை.

3 தமிழ் இணையக் கல்விக்கழகம்.<http://www.tamilvu.org/>

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A4HA | HINDI - IV | LANGUAGE- I | 3 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- the techniques for expansion of ideas and translation process

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the fundamentals of novels and stories | K1 |
| CO2 | Understand the principles of translation work | K2 |
| CO3 | Expose the knowledge writing critical views on fiction | K2 |
| CO4 | Build creative ability | K3 |
| CO5 | Apply the power of creative reading | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | ✓ | ✓ |
| CO2 | | ✓ | | | ✓ |
| CO3 | ✓ | | ✓ | ✓ | |
| CO4 | | | | | ✓ |
| CO5 | ✓ | ✓ | ✓ | | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | - | Entrepreneurial Development |
| ✓ | Employability | - | Innovations |
| - | Intellectual Property Rights | - | Gender Sensitization |
| - | Social Awareness/ Environment | - | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A4HA | HINDI- IV | SEMESTER IV |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 48 h

## Syllabus

**Unit I** 10 h

नाटक

**Unit II** 10 h

एकांकी

**Unit III** 10 h

काव्य मंजरी

**Unit IV** 10 h

सूचना लेखन

**Unit V** 08 h

अनुवाद अभ्यास- III

## Text Books

1. लडाई – सर्वेश्वरदयाल सक्सेना प्रकाशक: वाणी प्रकाशन 21-A, दरियागंज नई दिल्ली-110002. (Unit I)
2. एकांकी पंचामृत – डॉ राम कुमार (भोर और तारा छोड्कर) प्रकाशक: जवाहर पुस्तकालय सदर बाजार, मथुरा उत्तर प्रदेश-281001. (Unit II)
3. काव्य मंजरी- (डा मुन्ना तिवारी) मैथिलीशरण गुप्त- मनुष्यता, जयशंकर प्रसाद- बीती विभावरी जागरी सूर्यकान्त त्रिपाठी निराला- तोडती पत्थर और भिक्षुक. (Unit III)
4. सूचना लेखन पुस्तक: व्याकरण प्रदिप – रामदेव प्रकाशक: हिन्दी भवन 36 इलाहाबाद -211024. (Unit IV)
5. अनुवाद अभ्यास (केवल अंग्रेजी से हिन्दी में) (पाठ 10 to 20) प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई -17 (पाठ10 to 20). (Unit V)

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A4MA | MALAYALAM- IV | LANGUAGE - I | 3 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the fundamentals of novels and stories | K1 |
| CO2 | Understand the principles of translation work | K2 |
| CO3 | Expose the knowledge writing critical views on fiction | K2 |
| CO4 | Build creative ability | K3 |
| CO5 | Apply the power of creative reading | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | ✓ | |
| CO2 | ✓ | | | | ✓ |
| CO3 | | ✓ | ✓ | | |
| CO4 | ✓ | | | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | | ✓ |

**COURSE FOCUS ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | - | Entrepreneurial Development |
| ✓ | Employability | - | Innovations |
| - | Intellectual Property Rights | - | Gender Sensitization |
| - | Social Awareness/ Environment | - | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A4MA | MALAYALAM- IV | SEMESTER IV |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 48 h

## Syllabus

**Unit I** **Drama** 10 h

Saketham- Sreekandan Nair

**Unit II** **Drama** 10 h

Saketham- Sreekandan Nair

**Unit III** **Drama** 10 h

Saketham- Sreekandan Nair

**Unit IV** **Screen Play** 10 h

Perumthachan- Vasudevan Nair

**Unit V** **Screen Play** 08 h

Perumthachan- Vasudevan Nair

### Text Books

1 Nair, Sreekandan C.N. 2023. Saketham, Drama. DC Books Kottayam, Kerala, India. (Unit I to III)

2 Nair, Vasudevan M.T. 1994. Perumthachan- Screenplay. DC Books Kottayam, Kerala, India. (Unit IV & V)

### Reference

1 Sankarapillai. 2005. Malayala Nataka Sahithya Charithram, Kerala Sahithya Akademi Publishers, Kerala, India.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231TL1A4FA | FRENCH - IV | LANGUAGE- I | 3 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written- Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Learn the Basic verbs, numbers and accents | K1 |
| CO2 | Apply the adjectives and the classroom environment in France | K2 |
| CO3 | Select the Plural, Articles and the Hobbies | K2 |
| CO4 | Measure the Cultural Activity in France | K3 |
| CO5 | Evaluate the sentiments, life style of the French people and the usage of the conditional tense | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | | ✓ |
| CO2 | ✓ | ✓ | | | |
| CO3 | | | ✓ | ✓ | |
| CO4 | ✓ | ✓ | | | ✓ |
| CO5 | ✓ | | ✓ | ✓ | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | _ | Entrepreneurial Development |
| ✓ | Employability | _ | Innovations |
| _ | Intellectual Property Rights | _ | Gender Sensitization |
| _ | Social Awareness/ Environment | _ | Constitutional Rights/ Human Values/ Ethics |

| 231TL1A4FA | FRENCH - IV | SEMESTER IV |
|---|---|---|

**Total Credits:** 3
**Total Instruction Hours:** 48 h

**Syllabus**

**Unit I** 10 h

| | | | |
|---|---|---|---|
| °Décrirequelqu'un. ° Comparer | En milieu professional, recruiter quelquún et justifier sonchoix. | S'exprimersur les styles de vêtemantReconnaitre des personnes à partit de descriptions. | Comprendre la description de personnesdans un extrait de roman. |

**Unit II** 10 h

| | | | |
|---|---|---|---|
| ExprimerPaccord ou le désaccord. ° Se situerdans le temps. | En milieu professional, recruiter quelquún et justifier sonchoix. | Décrire des personnes. Comprendre des personnes qui experiment leur accord ouleurdésaccord. | Comprendre des différences de points de vueexprimétesdans de message électronique. Raconter unsourvenir. |

**Unit III** 10 h

| | | | |
|---|---|---|---|
| ° Parler de Pavenir. | Discuter de l'organisation d'un voyage de groupepuispréparerune fiche projet et la templit. | Comprendreune chanson. Echangersursesprojets de vacancy | Comprendre le message d'une carte d'anniversaire |

**Unit IV** 10 h

| | | | |
|---|---|---|---|
| ° Exprimer des souhaits. ° Décrirequelq u'u n | Discuter de l'organisation d'un voyage de groupepuispréparerune fiche projet et la templit. | Discuter du programme de la soire à venir. Addresser des souhaits à quelqu'un. | Comprendre le message d'une carte d'anniversaire |

**Unit V** 08 h

| |
|---|
| Make in Own Sentences based on the above Lessons |

**Text Book**

1 LATITUDES 1 (Méthode de français) Pages from 128-151, Author : Regine Mérieux, Yves Loiseau ( Unit I to IV)

| CourseCode | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 231EL1A4EA | ENGLISH - IV | LANGUAGE II | 3 | 1 | - | 3 |

**PREAMBLE**

This course has been designed for students to learn and understand

- how language shapes society, enhancing critical reading, writing, and thinking skills through various literary forms
- the fundamentals of writing, including essay composition, persuasive communication, and creative expression
- the process of critical thinking through the analysis of literature

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Summarize main points and supporting details from listening to public addresses and demonstrate poem comprehension. | K2 |
| CO2 | Demonstrate clear and expressive speech while engaging in role-play and dramatization activities. | K3 |
| CO3 | Interpret textual elements such as themes, tone, and authorial intent in various reading materials. | K3 |
| CO4 | Develop clear summaries and paraphrases, maintaining the essence of the original text. | K3 |
| CO5 | Prepare for job interviews by employing appropriate interview techniques, confidence, and professionalism. | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | | ✓ | ✓ |
| CO2 | | ✓ | | ✓ | |
| CO3 | ✓ | | ✓ | | |
| CO4 | | ✓ | | | ✓ |
| CO5 | ✓ | | ✓ | | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| ✓ | Social Awareness/ Environment | | Constitutional Rights/ Human values/ Ethics |

| 231EL1A4EA | ENGLISH - IV | SEMESTER IV |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 48h

**Syllabus**

**Unit I** **Listening** 10 h

**Nissim Ezekeil - Goodbye Party for Miss Pushpa T.S.**
**D.H. Lawrence - Last Lessons of the Afternoon**
**Dr. APJ Abdul Kalam's speech at European Union**
Listening for subtext – Tone and Emotion – Vivid Language and Pacing – Listening for Vision and Hope – Use of Storytelling
Punctuations: Periods, Commas, Semicolons, Colons, Apostrophes, Ellipses, Exclamation Points

**Unit II** **Speaking** 10 h

**Oscar Wilde - The Importance of Being Earnest**
Direct Speech and Indirect Speech - Commands and Requests, Exclamations and Wishes, Conversion of Indirect to Direct
Rules for changing direct speech into indirect speech

**Unit III** **Reading** 09 h

**Gita Hariharan - The Remains of the Feast -**
**Langston Hughes - Thank You M'am**
Making Inferences and Predictions - Identifying Author's Purpose and Tone- Contextual Vocabulary Building
Tenses: The Uses of Present, Past and Future Tenses

**Unit IV** **Writing Skills** 10 h

**George Orwell - Why I Write**
Summarizing vs. Paraphrasing - Expressing Purpose and Intent in Writing- Constructing Strong Arguments and Opinions
Grammar - Paraphrasing - Use of Paraphrasing, Characteristics of a good paraphrase, The Paraphrase of Poetry,Special Hints, Method of Procedure

**Unit V** **Soft Skills** 09 h

**Steve Jobs - 2005 Stanford Commencement Address** - Effective Communication - Presentation Skills
Business Corporate Soft Skills - Six common corporate conversation faux pas, Decision making Techniques, Negotiation Styles Job Interviews - Preparatory Steps for Job Interviews - Interview Skill Tips

**Text Books**


1. Straus, Jane, Lester Kaufman, and Tom Stern, editors. The Blue Book of Grammar and Punctuation: An Easy-to-Use Guide with Clear Rules, Real-World Examples, and Reproducible Quizzes. 12th ed., Jossey-Bass, 2021.(Unit I)
2. Wilde, Oscar. The Importance of Being Earnest. Edited by Norman Page, 2nd ed., Penguin Classics, 2000. (Unit II)
3. Hariharan, Gita. The Remains of the Feast. 1st ed., Penguin Books India, 1992. (Unit III)
4. Orwell, George. "Why I Write." George Orwell: An Anthology of His Prose, edited by John Carey, Harcourt, 2000. pp. 232-237. (Unit IV)
5. Meyer, John. The Soft Skills Handbook for Corporate Success: Essential Strategies for Business Professionals. 2nd ed., Business Insights, 2020. (Unit V)


**References**


1. Lawrence, D.H. The Complete Poems of D.H. Lawrence. Edited by V.J. Harding, 1st ed., Heinemann, 1992.
2. Buczynski, Mark. Soft Skills for the Workplace: How to Build Successful Relationships and Advance Your Career. 2nd ed., Wiley, 2018.
3. Hughes, Langston. "Thank You, M'am." The Penguin Anthology of American Poetry, edited by Rita Dove, Penguin Books, 2006, pp. 530-533.
4. Nelson, Brian. The Soft Skills Handbook: Essential Skills for the Workplace. 3rd ed., Business Publishing, 2019.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 234AI1A4CA | FOUNDATIONS OF ARTIFICIAL INTELLIGENCE | CORE | 4 | - | - | 4 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the foundations of Artificial Intelligence.
- the basic areas of artificial intelligence including problem solving, knowledge representation and reasoning.
- to demonstrate working knowledge of reasoning in the presence of uncertain information.

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | understand the fundamentals of Artificial Intelligence. | K2 |
| CO2 | demonstrate the informed and uninformed search techniques. | K2 |
| CO3 | interpret the formal methods of knowledge representation. | K3 |
| CO4 | apply logic and reasoning techniques to AI applications. | K3 |
| CO5 | explore the various AI applications and expert systems. | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | | |
| CO2 | | ✓ | ✓ | ✓ | |
| CO3 | ✓ | | ✓ | ✓ | |
| CO4 | | ✓ | | ✓ | ✓ |
| CO5 | | ✓ | | ✓ | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | ✓ | Innovations |
| ✓ | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human values/ Ethics |

| 234AI1A4CA | FOUNDATIONS OF ARTIFICIAL INTELLIGENCE | SEMESTER IV |
|---|---|---|

**Total Credits:** 4

**Total Instruction Hours:** 48 h

## Syllabus

**Unit I** Foundations of AI 08 h

Introduction: AI Problems and Techniques - Problem Solving Methods: State Space Search -Production Systems – Problem Characteristics – Control Strategies – Issues in the Design of Search programs – Search Strategies.

**Unit II** Informed and Uninformed Search 10 h

Generate and Test Method – Hill Climbing Method – Best First Search and A* Search – Means End Analysis – Intelligent Agents and Environments – Problem Reduction – AO* Algorithm – Constraint Satisfaction with Inference - Local Search Algorithms.

**Unit III** Knowledge Representation 10 h

Introduction: Ontologies, Objects and Events – Representations and Mappings – Approaches to Knowledge Representation – Forward Vs Backward Chaining - Matching and Control Knowledge – Slot and Filler Structures - Issues in Knowledge Representation – Developments in Knowledge Representation.

**Unit IV** Logic in AI 10 h

Propositional Logic – First Order Logic – Prolog: Logic Programming – Symbolic Logic – Conversion: English to Prolog – Terminologies – Variables and Operators – Inference Process - Tracing Model of Execution – List Structures – Operations - Drawbacks of Prolog – Applications.

**Unit V** Applications of AI 10 h

Game Playing: Minimax Search Procedure – Alpha – Beta Cutoff - Text Analysis and Mining: Language Models - Text Classification - Information Retrieval – Information Extraction - Expert systems: Knowledge Representation – Expert System Shells - Knowledge Acquisition.

**Text Books**

1 Lavika Goel, 2021, "Artificial Intelligence – Concepts and Applications ", 1st Edition, Wiley India Pvt. Ltd.

**References**

1 Elaine Rich, Kevin Knight and Shiv Shankar B. Nair, 2009,"Artificial Intelligence (SIE)", 3rdEdition, Tata McGraw Hill.

2 Wolfgang Ertel, 2017," Introduction to Artificial Intelligence", 2ndEdition, Springer.

3 Stephen Lucci and Danny Kopec, 2015," Artificial Intelligence in the 21st Century", 2nd Edition, Mercury Learning and Information.

4 Stuart Russell, Peter Norvig, 2011, "Artificial Intelligence - A Modern Approach", 3rd Edition, Prentice Hall.

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 234IT1A4CA | SOFTWARE ENGINEERING | CORE | 3 | - | - | 3 |

**PREAMBLE**

**This course has been designed for students to learn and understand**

- Principles of software engineering
- Software development process
- Software testing methodologies

COURSE OUTCOMES

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the concept of software engineering | K2 |
| CO2 | Identify software engineering process models | K1 |
| CO3 | Summarize software requirements for building software design | K2 |
| CO4 | Understand design concepts and architectural design | K2 |
| CO5 | Interpret various software testing strategies | K2 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO2 | ✓ | | ✓ | ✓ | ✓ |
| CO3 | ✓ | | ✓ | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | ✓ | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human values/ Ethics |

| 234IT1A4CA | SOFTWARE ENGINEERING | SEMESTER IV |
|---|---|---|

**Total Credits:** 3

**Total Instruction Hours:** 36 h

## Syllabus

**Unit I** Introduction to Software Engineering 06 h

Nature of Software: Defining Software, Software Application Domains, Legacy Software-The changing nature of Software: Web Apps-Mobile Applications-Cloud Computing-Product Line Software-Defining the Discipline - Software Process: Process Framework -Umbrella Activities -Process Adaptation- Software Engineering Practice: Essence of practice -General Principles - Generic Process Model - Defining a Framework Activity- identifying the task

**Unit II** Software Process 08 h

Perspective Process Model: Waterfall Model, Incremental Process Model, The RAD Model - Evolutionary process model: Prototyping, The Spiral model-Concurrent development model-Agile development: Agile Process- Extreme Programming-Agile Process models: Scrum - Dynamic Systems Development methods -Agile modeling - Agile unified process

**Unit III** Requirements 07 h

Requirements Engineering-Establishing groundwork- Eliciting requirements-Developing Use Cases-Building analysis model-Negotiating Requirements-Requirement Monitoring-Validating Requirements.

**Unit IV** Design Concepts and Architectural Design 07 h

Design Concepts: Abstraction –Architecture –Patterns –Modularity - Information Hiding -Functional Independence –Refinement –Aspects –Refactoring - and Object Oriented Design Concept -Design Classes - Design Model: Data Design Elements - Architectural Design Elements - Interface Design Elements – Component-level Design Elements - Architectural Design: Software Architecture - Architectural Genres - Architectural Styles - Architectural Considerations - Architectural Decisions - Architectural Design.

**Unit V** Software Testing 08 h

A strategic Approach to Software Testing – Strategic Issues- Unit Testing-Integration testing- Validation testing: Validation-Test Criteria, Alpha and Beta testing -System Testing: Recovery Testing -Security Testing -Stress testing - Performance Testing -Deployment testing -The art of debugging- White box testing - black box testing- An overview of Software Testing Tools.

**Text Books**

1 Roger S.Pressman. Bruce R.Maxim, 2019, "Software Engineering A Practitioner's Approach", 8th Edition, McGraw Hill Education,

**References**

1 Hitesh Mohapatra, Amiya Kumar Rath, 2020, "Fundamentals of Software Engineering", BPB Publications.

2 Ian Sommerville,2017,"Software Engineering", Pearson Education, 10th Edition

3 https://katalon.com/resources-center/blog/automation-testing-tools

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 234DA1A4EP | PYTHON FOR DATA SCIENCE | CORE PRACTICAL | 3 | - | 4 | 5 |

**PREAMBLE**

This course has been designed for students to learn and understand

- Concepts and process of data analysis
- Basic packages to perform scientific computing with Python
- Data visualization techniques for effective analysis

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the fundamentals of Data Analysis and basics of Python | K2 |
| CO2 | Apply NumPy library to perform basic operations like indexing, iterating and handling arrays | K3 |
| CO3 | Implement Pandas library to analyze, clean and explore datasets to prepare them for analysis | K3 |
| CO4 | Apply advanced features of Pandas library to perform data manipulation | K3 |
| CO5 | Implement Matplotlib library to visualize the data in different forms | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | | ✓ | ✓ |
| CO2 | | ✓ | ✓ | | |
| CO3 | ✓ | ✓ | | ✓ | |
| CO4 | | | ✓ | ✓ | |
| CO5 | ✓ | ✓ | | | |

COURSE FOCUSES ON

| | | | |
|---|---|---|---|
| ✓ | Skill Development | | Entrepreneurial Development |
| ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human values/ Ethics |

| 234DA1A4EP | PYTHON FOR DATA SCIENCE | SEMESTER IV |
|---|---|---|

**Total Credits:** 5

**Total Instruction Hours:** 84 h

## Syllabus

**Unit I** Introduction to Data Analysis and Python 17 h

Introduction to Data Analysis: Data Analysis - Knowledge Domains of the Data Analyst - Understanding the Nature of the Data - The Data Analysis Process - Quantitative and Qualitative Data Analysis - Open Data - Introduction to Python - The Programming Language - Data Structures - Functional programming

a) Programs using functions.

b) Programs using tuples.

c) Programs using sets.

**Unit II** NumPy Library 17 h

NumPy: N-dimensional array - Basic Operations - Indexing, Slicing and Iterating - Conditions and Boolean Arrays - Shape and Array Manipulation - Copies of Objects - Vectorization - Broadcasting - Structured Arrays- Reading and Writing Array Data on Files.

a) Programs using aggregate functions.

b) Programs for array manipulation.

c)Programs for reading and writing in files.

**Unit III** Pandas Library 17 h

Pandas Data Structures: Series - DataFrame - Index Object - Functionalities on Indexes - Operations Between Data Structures - Function Application and Mapping - Sorting and Ranking - Correlation and Covariance - Not a Number Data - Hierarchical Indexing and Leveling

a) Programs using DataFrame

b) Programs to deal with missing values

c) Programs to find Correlation and Covariance

**Unit IV** Data Manipulation using Pandas 17 h

Data Preparation - Concatenating - Data Transformation - Removing Duplicates- Mapping- Discretization and Binning - Permutation - String Manipulation - Built - in Methods - Regular Expressions - Data Aggregation - Group Iteration - Advanced Data Aggregation

a)Programs to implement data transformation

b) Programs to implement string manipulation

c) Programs to implement data aggregation

**Unit V** Data Visualization with Matplotlib 16 h

Matplotlib Architecture - Pyplot - The plotting Window - Using the keyword args - Adding Elements to the Chart - Line Charts - Histograms - Bar Charts - Pie Charts - Advanced Charts

a)Programs to visualize data using Bar Charts, Pie charts

b)Programs to visualize data using Advanced Charts

c)Project using Advanced libraries

**Text Books**

1 Fabio Nelli, 2023, "Python Data Analytics with Pandas, NumPy and Matplotlib", 3rd Edition, Apress.

**References**

1 Wes Mckinney, 2017, "Python for Data: Data Wrangling with Pandas, NumPy, and IPython", 2nd Edition, O'Reilly

2 Jake VanderPlas, 2016, "Python Data Science Handbook",1st Edition, O'Reilly

3 RehanGuha, 2021 " Machine Learning Cookbook with Python ", 1st Edition, BPB Publications.

4 Dipanjan Sarkar,RaghavBali,Tushar Sharma, 2018,"Practical Machine Learning with Python",1st Edition, Apress

| 234DA1A4SP | SEC PRACTICAL: DATA MINING | SEMESTER IV |
|---|---|---|

**Total Credits:** 2
**Total Instructions Hours:** 48 h

| S.No | Contents |
|---|---|
| 1 | Demonstration of Preprocessing tasks |
| 2 | Demonstrate Principal Component Analysis for a given dataset |
| 3 | Implement Apriori algorithm |
| 4 | Demonstrate Association Rule Mining on Stores dataset |
| 5 | Demonstrate SVM Classification |
| 6 | Demonstrate Linear Regression |
| 7 | Demonstrate Naive Bayes Classification for Credit Risk Assessment |
| 8 | Demonstrate DBSCAN clustering |
| 9 | Implement Decision tree for products dataset |
| 10 | Implement KNN algorithm |
| 11 | Implement the Outlier detection algorithm |
| 12 | Compare the performance of different clustering algorithm for a dataset |

| Course Code | Course Name | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|
| 235CO1A4IA | CUSTOMER RELATIONSHIP MANAGEMENT | IDC | 4 | - | - | 4 |

**PREAMBLE**

This course has been designed for students to learn and understand

- the Customer Relationship Management.
- the strategic customer acquisition and retention techniques in CRM.
- the conceptual aspects of service quality.

**COURSE OUTCOMES**

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

| CO Number | CO Statement | Knowledge Level |
|---|---|---|
| CO1 | Understand the concept of Customer Relationship Management | K2 |
| CO2 | Identify the road map for CRM. | K3 |
| CO3 | Outline the strategies for retaining the customers | K2 |
| CO4 | Apply the technological trends in CRM. | K3 |
| CO5 | Enhance the customer loyalty. | K3 |

**MAPPING WITH PROGRAMME OUTCOMES**

| COs/POs | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | ✓ | | ✓ | ✓ | ✓ |
| CO2 | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO3 | | ✓ | ✓ | ✓ | ✓ |
| CO4 | | | ✓ | ✓ | ✓ |
| CO5 | ✓ | ✓ | ✓ | | ✓ |

**COURSE FOCUSES ON**

| | | | |
|---|---|---|---|
| ✓ | Skill Development | ✓ | Entrepreneurial Development |
| ✓ | Employability | | Innovations |
| | Intellectual Property Rights | | Gender Sensitization |
| | Social Awareness/ Environment | | Constitutional Rights/ Human Values/ Ethics |

| 235CO1A4IA | CUSTOMER RELATIONSHIP MANAGEMENT | SEMESTER IV |
|---|---|---|

**Total Credits:** 4

**Total Instruction Hours:** 48 h

**Syllabus**

**Unit I** Understanding customers 12 h

Customer information Database – Customer Profile Analysis – Customer perception- Expectations analysis – Customer Behavior in relationship perspectives; individual and group customers– Customer life time value– Selection of Profitable customer segments.
Case study on customer behaviour.

**Unit II** CRM strategies 8 h

Elements of CRM – CRM Process – Strategies for Customer acquisition – Retention and Prevention of defection – Models of CRM – CRM road map for business applications.

**Unit III** CRM Planning and Implementation 12 h

Strategic CRM planning process–Implementation issues – CRM Tools- Analytical CRM – Operational CRM – Call centre management – Role of CRM Managers – CRM Implementation Road Map- Developing a Relationship Orientation –Customer-centric Marketing Processes–Customer retention plans.
Case study on operational CRM.

**Unit IV** Trends in CRM 8 h

CRM Solutions – Data Warehousing – Data mining for CRM –CRM software packages – The Technological Revolution: Relationship Management–Changing Corporate Cultures.

**Unit V** Recognizing Customer Lifetime Value 8 h

Defining Customer Lifetime Value - Looking at Best Practices for CLV - Getting Started with Predictive Modeling - Personalizing Cross-Sells and Upsells - Enhancing Customer Loyalty and Retention: Coping with Customer Churn - Increasing Customer Retention - Operationalizing Analytics to Make Better Decisions - Growing Customer Loyalty and Advocacy
Case study on increasing customer retention.

**Note:**Case Studies related to the above Topics to be discussed Examined Internally.

**Text Books**


1 Zikmund, 2021, "Customer Relationship Management", Wiley.

2 Tejendra Singh, 2020, "Customer Relationship Management", 1st Edition, Horizon Press, Jaipur.


**References**


1 Jagdish N. Sheth, 2021, "Customer Relationship Management: Emerging Concepts Tools and Applications", MC Graw Hill Education Pvt Ltd, Chennai.

2 Govinda Bhat. K, 2017, "Customer Relationship Management", Himalaya Publishing House New Delhi.

3 Peeru H Mohamed and A Sahadevan, 2017, "Customer Relationship Management", Vikas Publishing.

4 Shainesh, Jagdish, N.Sheth, 2015, "Customer Relationships Management Strategic Perspective", Macmillan.


5/11/24

BoS Chairman/HoD
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Dr.N.G.P. Arts and Science College
APPROVED

| BoS- 11th | AC - 18th | GB - |
|---|---|---|
| 05.11.24 | 26.11.24 | |

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