# PANIMALAR
## ENGINEERING COLLEGE

### An Autonomous Institution
Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai

# CURRICULUM & SYLLABUS

# REGULATION 2023
## for the students admitted during 2024-25

# B.E - MECHANICAL ENGINEERING

www.panimalar.ac.in

# PANIMALAR ENGINEERING COLLEGE

**(An Autonomous Institution, Affiliated to Anna University, Chennai)**
**Bangalore Trunk Road, Varadharajapuram,**
**Poonamallee, Chennai – 600 123**



## Department of Mechanical Engineering
## B.E- Mechanical Engineering

**CURRICULUM AND SYLLABUS**
**REGULATION-2023**
(Students admitted 2024-25 onwards)

## PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

1. Graduates will contribute to the industrial and societal needs as per the recent developments using knowledge acquired through basic engineering education and training.

2. Graduates will be able to demonstrate technical knowledge and skills in their career with systems perspective, analyze, design, develop, optimize, and implement complex mechanical systems.

3. Graduates will be able to work in multidisciplinary environment developing complex mechanical systems.

4. Graduates will work as a team or as an individual with utmost commitment towards the completion of assigned task using apt communication, technical and management skills.

5. Graduate will recognize the importance of professional development by pursuing higher studies in various specializations.
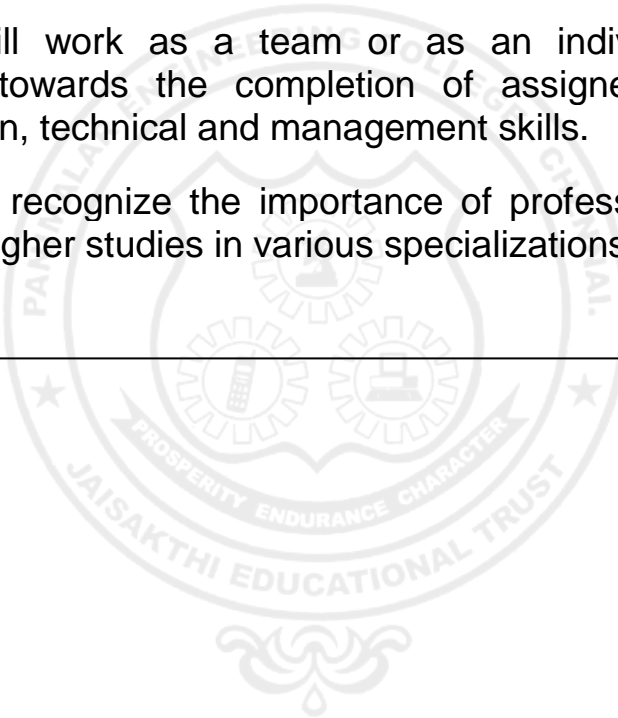
# PROGRAM OUTCOMES (PO)

**PO1 (Engineering knowledge)**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO2 (Problem Analysis):** Identify, formulate, research literature, and analyze complex engineering problem reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO3(Design/development of solutions):** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4 (Conduct investigations of complex problems):** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5(Modern tool usage):** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**PO6(The engineer and society):** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the Professional engineering practice.

**PO7 (Environment and sustainability):** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8 (Ethics):** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice

**PO9 (Individual and team work):** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings

**PO10(Communication):** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO11 (Project management and finance):** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO12 (Life-long learning):** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## PROGRAMME SPECIFIC OUTCOMES (PSO)

**PSO 1: Fundamental Domain Knowledge:** Design mechanical systems in various fields of machine elements, thermal, manufacturing, industrial and inter disciplinary fields using engineering/technological tools
.

**PSO 2: Usage of software programs:** Resolve new challenges in Mechanical Engineering using modern computer tools and software programs.

**PSO 3**: **Continual learning and Research:** Develop intellectual and technical solution to complex mechanical problems through continual learning and research.

# B.E.- MECHANICAL ENGINEERING

## CHOICE BASED CREDIT SYSTEM (CBCS)

## I - VIII SEMESTERS CURRICULUM AND SYLLABI (REGULATION 2023)

(For the Students admitted during 2024-25)

| S.No | COURSE CODE | COURSE TITLE | Category | L/T/P | Contact Hours | Credit | Ext / Int Weightage |
|------|-------------|--------------|----------|-------|---------------|--------|---------------------|
| **Semester I** | | | | | | | |
| | | **Theory Courses** | | | | | |
| 1. | 23MA1101 | Matrices and Calculus | BS | 3/1/0 | 4 | 4 | 60/40 |
| 2. | 23ES1106 | Programming in C | ES | 3/0/0 | 3 | 3 | 60/40 |
| 3. | 23ES1103 | Engineering Graphics | ES | 2/0/2 | 4 | 3 | 60/40 |
| | | **Theory Cum Practical Courses** | | | | | |
| 4. | 23HS1103 | Communicative English and Language Skills I | HS | 2/0/2 | 4 | 3 | 50/50 |
| 5. | 23PH1103 | Engineering Physics | BS | 2/0/2 | 4 | 3 | 50/50 |
| | | **Laboratory Courses** | | | | | |
| 6. | 23ES1113 | Programming in C Laboratory | ES | 0/0/4 | 4 | 2 | 40/60 |
| | | **Mandatory Course** | | | | | |
| 7. | 23TA1101 | தமிழர் மரபு / Heritage of Tamils | HS | 1/0/0 | 1 | 1 | 60/40 |
| 8. | 23HS1104 | Interpersonal Communication skills I | EEC | 0/0/2 | 2 | 0 | 0/100 |
| 9. | 23HS1105 | Quantitative Aptitude Practices I | EEC | 0/0/1 | 1 | 0 | 0/100 |
| | | | **TOTAL** | | 27 | 19 | |

| S. No | COURSE CODE | COURSE TITLE | Category | L/T/P | Contact Hours | Credit | Ext / Int Weightage |
|---|---|---|---|---|---|---|---|
| **Semester II** | | | | | | | |
| | | **Theory Courses** | | | | | |
| 1. | 23MA1201 | Complex Variables and Laplace Transform | BS | 3/1/0 | 4 | 4 | 60/40 |
| 2. | 23ME1201 | Engineering Mechanics | PC | 3/0/0 | 3 | 3 | 60/40 |
| 3. | 23ES1205 | Basic Electrical Engineering | ES | 3/0/0 | 3 | 3 | 60/40 |
| | | **Theory Cum Practical Courses** | | | | | |
| 4. | 23HS1203 | Communicative English and Language Skills II | HS | 2/0/2 | 4 | 3 | 50/50 |
| 5. | 23ES1203 | Fundamentals of Python programming | ES | 2/0/2 | 4 | 3 | 50/50 |
| | | **Laboratory Courses** | | | | | |
| 6. | 23ES1212 | Technical Skills Practices I | EEC | 0/0/2 | 2 | 1 | 40/60 |
| 7. | 23ES1213 | Product Development Laboratory | ES | 0/0/4 | 4 | 2 | 40/60 |
| 8. | 23ES1214 | Electrical Engineering Laboratory | ES | 0/0/4 | 4 | 2 | 40/60 |
| | | **Mandatory Course** | | | | | |
| 9. | 23TA1201 | தமிழரும் தொழில்நுட்பமும் / Tamils and Technology | HS | 1/0/0 | 1 | 1 | 60/40 |
| 10. | | Mandatory Course I | MC | 2/0/0 | 2 | 0 | 0/100 |
| 11. | 23HS1204 | Interpersonal Communication skills II | EEC | 0/0/2 | 2 | 0 | 0/100 |
| 12. | 23HS1205 | Quantitative Aptitude Practices II | EEC | 0/0/1 | 1 | 0 | 0/100 |
| | | | **TOTAL** | | 34 | 22 | |

| 23MA1101 | MATRICES AND CALCULUS | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 1 | 0 | 4 |

**COURSE OBJECTIVE:**

- Matrix algebra can be readily applied to the structural properties of graphs from an algebraic point of view.
- To introduce the concepts of limits, continuity, derivatives and maxima and Minima.
- To familiarize the functions of two variables and finding its extreme points.
- To provide understanding of various techniques of integration.
- To introduce integral ideas in solving areas, volumes and other practical problems.

**UNIT I**                **MATRICES**           **9+3**

Eigenvalues and Eigenvectors of a real matrix - Characteristic equation -Properties of Eigenvalues and Eigenvectors -Cayley Hamilton theorem -Diagonalization of matrices- Reduction of a quadratic form to canonical form by orthogonal transformation - Nature of quadratic forms.

**UNIT II**           **DIFFERENTIAL CALCULUS**         **9+3**

Representation of functions - Limit of a function - Continuity - Derivatives - Differentiation rules (Sum, Product & Quotient rule, Chain rule, logarithmic and implicit differentiation) - Maxima and Minima of functions of one variable and its applications.

**UNIT III**        **FUNCTIONS OF SEVERAL VARIABLES**      **9+3**

Partial differentiation - Total derivative - Change of variables –Jacobian"s- Taylor"s series for functions of two variables - Maxima and minima of functions of two variables - Lagrange"s method of undetermined multipliers

**UNIT IV**             **INTEGRAL CALCULUS**         **9+3**

Definite and Indefinite integrals - Substitution rule - Techniques of Integration - Integration by parts - Bernoulli"s formula- Integration of rational functions by partial fraction - Improper integrals.

**UNIT V**                    **MULTIPLE INTEGRALS**                    **9+3**

Double integrals in Cartesian and polar coordinates - Change of order of integration in Cartesian coordinates - Area enclosed by plane curves - Change of variables in double integrals -Triple integrals - Volume of Solids.

**TOTAL :60 PERIODS**

## COURSE OUTCOME

Upon completion of the course, students will be able to:

**CO1**  Find Eigen values and Eigen vectors, diagonalization of a matrix, symmetric matrices, and positive definite matrices.

**CO2**  Apply limit definition and rules of differentiation to differentiate functions.

**CO3**  Understand familiarity in the knowledge of Maxima and Minima, Jacobian, Taylor series and apply the problems involving Science and Engineering.

**CO4**  Understand the knowledge of Integration by parts, Integration of rational functions by partial fraction

**CO5**  Understand the knowledge of Area enclosed by plane curves, Change of variables in double integrals, Triple integrals, Volume of Solids.

## TEXT BOOKS

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44rd Edition, 2018.
2. James Stewart, "Calculus: Early Transcendental", Cengage Learning, 9th Edition, New Delhi, 2015.
3. Bali N., Goyal M. and Walkins C., "Advanced Engineering Mathematics", Firewall Media (An imprint of Lakshmi Publications Pvtt. Ltd.,), New Delhi, 7th Edition, 2015.

## REFERENCE BOOKS

1. Narayanan, S. and Manicavachagom Pillai, T. K., "Calculus" Volume I and II, S. Viswanathan Publishers Pvt. Ltd. Chennai, 2007.
2. Srimantha Pal and Bhunia, S.C, "Engineering Mathematics "Oxford University Press,2015.
3. B.V. Ramana "Higher Engineering Mathematics", McGraw Hill Education, India.
4. Erwin Kreyzig, Advanced Engineering Mathematics, John Wiley sons, 10th Edition,2015.
5. Sivaramakrishna Dass, C. Vijayakumari, "Engineering Mathematics", Pearson Education India, 4th Edition 2019.
6. Sundar Raj. M and Nagarajan. G , "Engineering Mathematics-I",3rd  Edition, Sree Kamalamani Publications, Chennai, 2020.

## ONLINE COURSES / RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc21_ma60/preview
2. https://onlinecourses.nptel.ac.in/noc21_ma58/preview

## CO-PO MAPPING

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 3 | 3 | | | | | | | | | 1 |
| CO2 | 3 | 3 | 3 | | | | | | | | | 1 |
| CO3 | 3 | 3 | 3 | | | | | | | | | 1 |
| CO4 | 3 | 3 | 3 | | | | | | | | | 1 |
| CO5 | 3 | 3 | 3 | | | | | | | | | 1 |

| Internal Assessment | | | | End Semester Examinations |
|---|---|---|---|---|
| Assessment I (100 Marks) | | Assessment II (100 Marks) | | |
| Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Written Examinations |
| 40 | 60 | 40 | 60 | 100 |
| **40%** | | | | **60 %** |

| 23ES1106 | PROGRAMMING IN C | L | T | P | C |
|----------|------------------|---|---|---|---|
| | | 3 | 0 | 0 | 3 |

**COURSE OBJECTIVE:**

To impart Knowledge on the following topics

- Syntax for C programming.
- Develop C Programs using basic programming constructs.
- Develop C programs using arrays and strings.
- Develop applications in C using functions, pointers.
- Develop applications using structures and union.

### UNIT - I                BASICS OF C PROGRAMMING                9

Introduction to programming paradigms – Algorithms – Flowchart - Structure of C program - C programming: Data Types — Storage classes - Constants — Enumeration Constants - Type Conversion Keywords – Operators: Precedence and Associativity - Expressions - Input/Output statements, Format specifiers, Assignment statements – Decision making statements - Switch statement – Break – Continue - Goto statement - Looping statements – Pre-processor directives - Compilation process.

### UNIT - II                ARRAYS AND STRINGS                9

Introduction to Arrays: Declaration, Initialization — One dimensional array — Example Program: Computing Mean, Median and Mode - Two dimensional arrays — Example Program: Matrix Operations (Addition, Multiplication, Determinant and Transpose) - String operations: length, compare, concatenate, copy, Reverse and Palindrome — Selection sort, Insertion sort - linear and binary search

### UNIT - III                FUNCTIONS AND POINTERS                9

Introduction to functions: Function prototype, function definition, function call, Built-in functions (string functions, math functions) – Recursion – Example Program: Computation of Sine series, Scientific calculator using built-in functions, Binary Search using recursive functions – Pointers – Pointer operators — Pointer arithmetic — Arrays and pointers — Array of pointers — Example Program: Sorting of names — Parameter passing: Pass by value, Pass by reference — Example Program: Swapping of two numbers and changing the value of a variable using pass by reference.

### UNIT - IV                STRUCTURES AND UNION                9

Structure - Nested structures– Pointer and Structures– Array of structures – Example Program using structures and pointers – Self-referentials structures – Dynamic memory allocation – Singly linked list– typedef and Union.

Files — Types of file processing: Sequential access, Random access — Sequential access file - Example Program: Finding average of numbers stored in sequential access file - Random access file - Example Program: Transaction processing using random access files — Command line arguments.

**TOTAL :   45 PERIODS**

## COURSE OUTCOME(S):

Upon completion of the course, students will be able to:

CO1    Remember fundamental concepts of C programming and the compilation process.

CO2    Explain the structure of C programs, algorithms, flowcharts, and the usage of arrays and strings in programming.

CO3    Utilize functions, pointers, structures, and unions to solve programming problems, including recursion and dynamic memory allocation.

CO4    Evaluate and compare different file processing techniques and their applications in real-world scenarios.

CO5    Assess the efficiency and effectiveness of various sorting and searching algorithms.

CO6    Develop and implement programs that demonstrate proficiency in C programming paradigms.

## TEXT BOOKS:

1. Reema Thareja, —Programming in C, Oxford University Press, Second Edition, 2016
2. Kernighan, B.W and Ritchie,D.M, —The C Programming language, Second Edition, Pearson Education, 2006.

## REFERENCE BOOKS:

1. Paul Deitel and Harvey Deitel, —— C How to Program, Seventh edition, Pearson Publication, 2015
2. Juneja, B. L and Anita Seth, —Programming in C, CENGAGE Learning India pvt. Ltd.,2011
3. Pradip Dey, Manas Ghosh, —Fundamentals of Computing and Programming in C, First Edition, Oxford University Press, 2009
4. Anita Goel and Ajay Mittal, —Computer Fundamentals and Programming in C, Dorling Kindersley (India) Pvt. Ltd., Pearson Education in South Asia, 2011
5. Byron S. Gottfried, "Schism"s Outline of Theory and Problems of Programming with C", McGraw-Hill Education, 1996.

## WEB REFERENCES:

1. https://github.com/tscheffl/ThinkC/blob/master/PDF/Think-C.pdf
2. https://freecomputerbooks.com/langCBooks.html

## ONLINE COURSES / RESOURCES:

1. https://www.programiz.com/c-programming
2. https://www.tutorialspoint.com/cprogramming/index.htm
3. https://www.javatpoint.com/c-programming-language-tutorial
4. https://www.geeksforgeeks.org/c-programming-language/
5. https://en.wikibooks.org/wiki/C_Programming
6. https://www.cprogramming.com/tutorial/c-tutorial.html?inl=hp

## CO – PO MAPPING

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2   | 1   | 1   | 1   |     | 1   |     |     |     |      |      |      |
| CO2 | 2   | 1   | 1   | 1   | 2   | 1   |     |     |     |      |      |      |
| CO3 | 3   | 2   | 2   | 1   | 3   | 1   |     |     |     |      |      |      |
| CO4 | 3   | 2   | 2   | 1   | 3   | 1   |     |     |     |      |      |      |
| CO5 | 2   | 1   | 1   | 1   | 2   | 1   |     |     |     |      |      |      |
| CO6 | 2   | 1   | 1   | 1   | 2   | 1   |     |     |     |      |      |      |

| Internal Assessment | | | | End Semester Examinations |
|---|---|---|---|---|
| Assessment I (100 Marks) | | Assessment II (100 Marks) | | |
| Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Written Examinations |
| 40 | 60 | 40 | 60 | 100 |
| **40%** | | | | **60 %** |

9

| 23ES1103 | ENGINEERING GRAPHICS | L | T | P | C |
|----------|----------------------|---|---|---|---|
|          |                      | 2 | 0 | 2 | 3 |

**COURSE OBJECTIVE:**

- To make the students understand with various concepts like dimensioning, conventions and standards related to Engineering Drawing.
- To impart knowledge on the projection of points, lines and plane surfaces.
- To improve the understanding of Projection of solids, Section of solids and Development of solid surfaces.
- To develop the skills of the students required to understand Intersection of solids and isometric projections.
- To enable the imaginative skills of students to make free hand sketching of Orthographic view and Isometric view.

**UNIT - 0          CONCEPTS AND CONVENTIONS (Not for Examination)          2**

Importance of drawing in engineering applications - Use of drafting instruments - BIS conventions and specifications - Size, layout and folding of drawing sheets - Lettering and dimensioning -  Introduction to Scales - Geometric construction - to draw perpendiculars, parallel lines, divide a line and circle, to draw equilateral triangle, square, regular polygons. Introduction to drafting packages like CAD and demonstration of their use in engineering fields.

**UNIT - I          ENGINEERING CURVES AND PROJECTION OF POINTS AND          6+6
LINES**

Basic construction of cycloid, epicycloid and hypocycloid - Drawing of tangents and normal to the above curves. Construction of involutes of square, pentagon and circle - Drawing of tangents and normal to the above involutes.

Orthographic projection – Introduction to Principal Planes of projections - First angle projection - Projection of points. Projections of straight lines (only in First angle projections) inclined to both the principal planes - Determination of true lengths, true inclinations and traces by rotating line method

**UNIT - II          PROJECTIONS OF PLANES AND PROJECTIONS OF SOLIDS          6+6**

Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method and auxillary plane method.

Projection of simple solids like prisms, pyramids, cylinder, and cone when the axis is inclined to one principle planes by rotating object method.

**UNIT - III          SECTIONS OF  SOLIDS AND DEVELOPMENT OF SURFACES          6+6**

Sectioning of solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section.

Development of lateral surfaces of simple solids and frustum and truncated solids – Prisms, pyramids cylinders and cones.

**UNIT - IV        INTERSECTION OF SOLIDS AND ISOMETRIC PROJECTIONS        6+6**

Line of intersection - Determining the line of intersection between surfaces of two interpenetrating two square prisms and Intersection of two cylinders with axes of the solids intersecting each other perpendicularly, using line method.

Principles of isometric projection – isometric scale –Isometric projections and isometric views of simple solids and frustum and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions.

**UNIT - V                        FREE-HAND SKETCHING                        5+5**

Steps in free hand sketching - Orthographic views (front, top and side views) of simple blocks from their Isometric view, Isometric view of simple blocks from their Orthographic views (front, top and side views)

**TOTAL :   60 PERIODS**

**COURSE OUTCOME(S):**

Upon completion of the course, students will be able to:
**CO1**    Understand the engineering curves  and draw orthographic projections of points, lines and planes
**CO2**    Apply orthographic projections principles for projection of planes and solids.
**CO3**    Analyse the section of solids and development of the surfaces of objects
**CO4**    Examine the isometric projections and intersection of curves of simple solids
**CO5**    Create free hand sketching of Orthographic Views and Isometric Views

**TEXT BOOKS:**

1. Natarajan, K. V., "A text book of Engineering Graphics", 3 4 th Ed., Dhanalakshmi Publishers, Chennai, 2021.

2. Venugopal, K. and Prabhu Raja, V., "Engineering Graphics", 14th Ed, New Age Publications, 2016

**REFERENCE BOOKS:**

1. Bhatt, N.D.,Panchal V M and Pramod R. Ingle, "Engineering Drawing", Charotar Publishing House, 54th Edition, 2023.
2. Parthasarathy, N. S. and Vela Murali, "Engineering Drawing", Oxford University Press, 2015
3. Agrawal, B. and Agrawal C.M., "Engineering Drawing", Tata McGraw, N.Delhi, 3rd Edition 2019

**WEB REFERENCES:**

**1.**    https://nptel.ac.in/courses/105/104/105104148/

**ONLINE COURSES / RESOURCES:**

1. https://nptel.ac.in/courses/112/103/112103019/

## CO – PO MAPPING

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 3 | 3 | 2 | 1 | - | - | - | - | - | - | 1 |
| CO2 | 3 | 3 | 3 | 2 | 1 | - | - | - | - | - | - | 1 |
| CO3 | 3 | 3 | 3 | 2 | 1 | - | - | - | - | - | - | 1 |
| CO4 | 3 | 3 | 3 | 2 | 1 | - | - | - | - | - | - | 1 |
| CO5 | 3 | 3 | 3 | 2 | 1 | - | - | - | - | - | - | 1 |
| CO6 | 3 | 3 | 3 | 2 | 1 | - | - | - | - | - | - | 1 |

| Internal Assessment | | | | End Semester Examinations |
|---|---|---|---|---|
| Assessment I (100 Marks) | | Assessment II (100 Marks) | | |
| Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Written Examinations |
| 40 | 60 | 40 | 60 | 100 |
| **40%** | | | | **60 %** |

| 23HS1103 | COMMUNICATIVE ENGLISH AND LANGUAGE SKILLS I | L | T | P | C |
|----------|---------------------------------------------|---|---|---|---|
|          |                                             | 2 | 0 | 2 | 3 |

**COURSE OBJECTIVE:**

- To induce the basic reading and writing skills among the first year engineering and technology students.
- To assist the learners to develop their listening skills, which will enable them listening to lectures and comprehend them by asking questions and seeking clarifications
- To succor the learners to develop their speaking skills and speak fluently in real contexts.
- To motivate the learners to develop vocabulary of a general kind by developing their reading skills for meeting the competitive exams like GATE, TOFEL, GRE, IELTS, and other exams conducted by Central and State governments

**UNIT I                    INFORMAL COMMUNICATION                    6**

Listening: Listening and filling details, Listening to Speeches by Specialists and Completing Activities such as Answering Questions, Identifying the Main Ideas, Style, etc. Speaking: Introducing One-self ─ Introducing a Friend/ Family. Reading: Descriptive Passages (From Newspapers / Magazines).Writing: Autobiographical Writing, Developing Hints. Grammar: Noun, Pronoun & Adjective. Vocabulary Development: One Word Substitution.
ACTIVITY:  Listening to self -introduction   before the interview committee after listening modules.

**UNIT II                    CONVERSATIONAL PRACTICE                    6**

Listening: Listening to Conversations (Asking for and Giving Directions).Speaking: Making Conversation Using (Asking for Directions, Making an Enquiry), Role Plays, and Dialogues. Reading: Reading a Print Interview and Answering Comprehension Questions. Writing: Writing a Checklist, Dialogue Writing Grammar: Tenses and Voices, Regular and Irregular Verbs. Vocabulary Development: Prefix &Suffix, Word formation.

ACTIVITY:  Listening to conversation and performing role play and Writing dialogues on various work context.

**UNIT III                    OFFICIAL COMMUNICATIONS                    6**

Listening: Listening for specific information. Speaking: Giving Short Talks on a given Topic. Reading: Reading Motivational Essays on Famous Engineers and Technologists (Answering Open-Ended and Closed Questions).Writing: Writing Permission Letters/Editor, Complaint, and Invitation. Emails and Review Writing-Books, Films. Grammar: Adverb, Prepositions & Conjunctions. Vocabulary Development: Collocations ─ Fixed Expressions.

ACTIVITY:  Preparing Permission letters and short talks and presentation on various topics related to professions.

**UNIT IV**             **COMMUNICATION AT WORK PLACE**       **6**

Listening: Listening to Short Talks (5 Minutes Duration and Fill a Table, Gap-Filling Exercise) Note Taking/Note Making .Speaking: Small Group Discussion, Giving Recommendations. Reading: Reading Problem —Solution Articles/Essays Drawn from Various Sources .Writing: Making Recommendations. Grammar: Subject-Verb Agreement, Framing Questions. Vocabulary Development: Infinitives and Gerunds, Reference Words, Technical Vocabulary.

ACTIVITY:  Listening to Group Discussion and sharing recommendation.

**UNIT V**            **DEFINITIONS AND PRODUCT DESCRIPTION**       **6**

Listening: Listening to a Product Description (labeling and Gap Filling) Exercises. Speaking: Describing a Product and Comparing and contrasting it with Other Products. Reading: Reading Graphical Material for Comparison (Advertisements).Writing: Essay Writing. Compare and Contrast Paragraphs, Essay writing. Grammar: Phrasal Verbs – Cause and Effect Sentences –Compound Nouns and Definitions. Vocabulary Development: Use of Discourse Markers.

ACTIVITY:   Reading about the modern gadgets and describing them.

**TOTAL :30 PERIODS**

## COURSE OUTCOME

Upon completion of the course, students will be able to:

**CO1**         Comprehend conversation and short talks delivered in English.
**CO2**         Participate effectively in informal conversation; introduce themselves and their friends and express opinions English.
**CO3**         Read articles of a general kind in magazines and newspaper.
**CO4**         Write short essays of a general kind and personal letters and emails in English.
**CO5**         Recognize the use of grammar in speech and writing.

## TEXT BOOKS:

1. N P Sudharshana & C Savitha. English for Technical Communication Delhi: 2019.
2. Board of Editors. English for Engineers and Technologists Volume 1 Orient Black Swan Limited, 2020

## REFERENCE BOOKS:

1. Board of Editors. Using English-A course book for Undergraduate engineers and Technologists Orient Black Swan Limited, 2017
2. Bailey, Stephen. Academic Writing: A Practical Guide for Students. New York: Rutledge, 2011.
3. Comfort, Jeremy, et al. Speaking Effectively: Developing Speaking Skills for Business English. Cambridge University Press, Cambridge: Reprint 2011
4. Means, L. Thomas and Elaine Langlois. English & Communication For Colleges. Cengage Learning ,USA:2007
5. Redston, Chris & Gillies Cunningham Face2Face (Pre-intermediate Student's Book& Workbook) Cambridge University Press, New Delhi: 2005.

**WEB REFERENCES:**
1. https://learnenglishteens.britishcouncil.org/exams/grammar-and-vocabulary-exams/wordformation
2. https://cdn.s3waas.gov.in/s347d1e990583c9c67424d369f3414728e/uploads/2018/02/20180316 21.pdf
3. http://xn--englishclub-ql3f.com/grammar/parts-of-speech.htm
4. https://www.edudose.com/english/grammar-degree-of-comparison-rules/

**ONLINE COURSES / RESOURCES:**
1. https://basicenglishspeaking.com/wh-questions/
2. https://agendaweb.org/verbs/modals-exercises.html
3. https://cdn.s3waas.gov.in/s347d1e990583c9c67424d369f3414728e/uploads/2018/02/2018031621.pdf
4. https://www.ego4u.com/en/cram-up/grammar/prepositions

**LANGUAGE SKILLS LAB          30 Hours**

**LIST OF EXPERIMENTS**

1. Listen to lectures- articulate a complete idea as opposed to producing fragmented utterances- Tedtalks, Science Fiction- My Fair Lady
2. Listening – following, responding to explanations, giving directions and instructions in academic and business contexts- IELTS,TOEFL.
3. Listening to transcripts and answer to the questions.
4. Listening for specific information: accuracy and fluency – BEC.
5. Reading: Different Text Type.
6. Reading: Predicting Content using pictures and titles.
7. Reading: Use of Graphic Organizers to review.
8. Reading: Aid Comprehension.
9. Reading: Speed Reading Techniques.
10. Reading and Comprehending the passages in the competitive exams like GATE, TOEFL, GRE, IELTS, and other exams conducted by Central and state governments.

## REFERENCE BOOKS:

1. Suresh Kumar.E and et al. Enriching Speaking and Writing Skills. Second Edition. Orient Blackswan: Hyderabad,2012

2. Davis, Jason and Rhonda Liss. Effective Academic Writing (level 3) Oxford University Press: Oxford,2006

3. Withrow, Jeans and et al. Inspired to write. Reading and Tasks to develop writing skills. Cambridge University Press: Cambridge,2004.

## CO-PO MAPPING

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | -   | -   | -   | -   | -   | -   | -   | -   | 3   | 3    | -    | 2    |
| CO2 | -   | -   | -   | -   | -   | -   | -   | -   | 3   | 3    | -    | 2    |
| CO3 | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 2    |
| CO4 | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 2    |
| CO5 | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 2    |
| CO6 | -   | -   | -   | -   | -   | -   | -   | -   | 3   | 3    | -    | 2    |

| Assessment (40% weightage) (Theory Component) | | Assessment (60% weightage) (Laboratory Component) | | End Semester Examination |
|---|---|---|---|---|
| **Individual Assignment / Case Study / Seminar / Mini Project** | **Written Test** | **Evaluation of Laboratory Observation, Record** | **Test** | **Written Examination** |
| 40 | 60 | 75 | 25 | |
| 100 | | | | 100 |
| 50 % | | | | 50 % |

| | | **L** | **T** | **P** | **C** |
|---|---|---|---|---|---|
| **23PH1103** | **ENGINEERING PHYSICS** | **2** | **0** | **2** | **3** |

**COURSE OBJECTIVE:**

● To impart knowledge in basic concepts of physics relevant to engineering applications
● To introduce advances in technology for engineering applications

**UNIT – I**                **PROPERTIES OF MATTERS**            **6**

**Elasticity:** Stress, strain, Hooke's law and elastic moduli – stress-strain diagram – twisting couple per unit twist for solid cylinder – torsional pendulum (theory) – bending moment of beam – non-uniform and uniform bending (theory)– I-shape girders

**Thermal Physics:** Mode of heat transfer: conduction, convection and radiation – thermal expansion of solids – bimetallic strips – thermal conductivity –Lee's disc method; theory and experiment – thermal insulation – applications

**UNIT – II**       **SEMICONDUCTING AND MAGNETIC MATERIALS**      **6**

**Semiconducting Materials**: Density of Energy State - Intrinsic Semiconductors – energy band diagram – carrier concentration in intrinsic semiconductors – extrinsic semiconductors (theory) – application – Hall effect

**Magnetic Materials:** Origin of magnetism – Basic definitions – Classifications of Magnetic Materials- Ferromagnetic Domain theory – M versus H Behaviour- Hard and Soft Magnetic materials – applications

**UNIT – III**                **MODERN OPTICS**              **6**

**Laser:** Population of energy levels, Einstein's A and B coefficients derivation – optical amplification (qualitative) – Semiconductor lasers: homojunction and heterojunction– industrial applications

**Fiber Optics**: components and principle of fiber optics – numerical aperture and acceptance angle derivation – types (material, refractive index, and mode) – losses associated with optical fiber – applications - pressure and displacement sensors

**UNIT –IV**       **QUANTUM PHYSICS AND NANOSCIENCE**       **6**

**Quantum Physics**: Blackbody radiation – Planck's hypothesis and derivation – wave particle duality of light: concepts of photon – de Broglie hypotheses – concept of wave function and its physical significance – Schrödinger's time independent and time dependent wave equations

**Nanoscience:** Introduction – Classification of nanomaterials (0D, 1D, 2D and 3D) – preparation (bottom up and top down approaches) - carbon nanotubes: types - mechanical, optical and electrical properties - applications

**UNIT –V**              **ELECTROMAGNETIC WAVES**          **6**

Divergence – curl – integral calculus – Gauss divergence theorem – Stoke's theorem – equation of continuity – displacement current – Maxwell's equations – Gauss's laws – Faraday's law –Ampere-Maxwell law – Hertz observation – production and detection of electromagnetic wave – mechanism of electromagnetic wave propagation – properties of electromagnetic waves                         **TOTAL : 30 PERIODS**

**COURSE OUTCOME**

Upon successful completion of the course, the students will be able to:

**CO1**  Understand the basics properties of materials, especially elastic and thermal properties of materials.

**CO2**  Have adequate knowledge on the concepts of semiconducting and magnetic materials and their applications in memory storage.

**CO3**  Acquire the knowledge on the concepts of lasers, fiber optics and their technological applications.

**CO4**  Get knowledge on fundamental concepts of quantum theory, nanoscience its applications.

**CO5**  Gain knowledge on the basics of electromagnetic waves and its properties.

**TEXT BOOKS:**

1.  Ajoy Ghatak, Optics, 5th Ed., Tata McGraw Hill, 2012
2.  Arthur Beiser, Shobhit Mahajan and S Rai Choudhury, Concepts of Modern Physics, 6th Edition, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2014
3.  B. K. Pandey and S. Chaturvedi, Engineering Physics, 1st edition, Cengage Learning India Pvt Ltd., New Delhi, 2017
4.  Karl.F.Reck, Basics of laser physics: for students of science and engineering, Second edition, Springer Publications

**REFERENCE BOOKS:**

1.  Halliday, D., Resnick, R. & Walker, J.—Principles of Physics, Wiley, 2015.
2.  Tipler, P.A. & Mosca, G. — Physics for Scientists and Engineers with Modern Physics'. W.H.Freeman, 2007.
3.  Ruby Das, C.S. Robinson, Rajesh Kumar, Prashant Kumar Sahu, A Textbook of Engineering Physics Practical, University Science Press, Delhi, II Edition (2016), ISBN 978-93-80386-86-7

**LIST OF EXPERIEMENTS**                    **30 HOURS**

1.  Determination of Moment of Inertia of the disc and Rigidity Modulus of the material of the wire – Torsional Pendulum
2.  Determination of Young's Modulus – Non - Uniform Bending
3.  Determination of Thermal Conductivity of the Bad Conductor – Lee's Disc Method
4.  Determination of thickness of a thin wire – Air wedge method
5.  (i) Determination of wavelength of Laser using Grating and Particle size determination

    (ii) Determination of Numerical Aperture and Acceptance angle of an Optical Fibre
6.  Determination of Velocity of ultrasonic waves in a liquid and compressibility of the liquid – Ultrasonic Interferometer
7.  Determination of wavelength of Hg source using Grating by normal incidence method using spectrometer
8.  Determine the energy band gap of a semiconductor

## CO-PO MAPPING

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3   | 3   | 2   | 1   | 1   | 1   | -   | -   | -   | -    | -    | -    |
| CO2 | 3   | 3   | 2   | 1   | 2   | 1   | -   | -   | -   | -    | -    | -    |
| CO3 | 3   | 3   | 2   | 2   | 2   | 1   | -   | -   | -   | -    | -    | 1    |
| CO4 | 3   | 3   | 1   | 1   | 2   | 1   | -   | -   | -   | -    | -    | -    |
| CO5 | 3   | 3   | 1   | 1   | 2   | 1   | -   | -   | -   | -    | -    | -    |

| Assessment (40% weightage) (Theory Component) | | Assessment (60% weightage) (Laboratory Component) | | End Semester Examination |
|---|---|---|---|---|
| Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Evaluation of Laboratory Observation, Record | Test | Written Examination |
| 40 | 60 | 75 | 25 | |
| 100 | | | | 100 |
| 50 % | | | | 50 % |

| | | L | T | P | C |
|---|---|---|---|---|---|
| **23ES1113** | **PROGRAMMING IN C LABORATORY** | 0 | 0 | 4 | 2 |

**COURSE OBJECTIVE**

To impart Knowledge on the following topics:

- Understand basic programming concepts through I/O statements and expressions.
- Develop proficiency in decision-making constructs for program flow control.
- Implement algorithms for common tasks like leap year detection, Armstrong number check, and weighted sum calculation.
- Design and implement user-friendly applications such as a calculator with various operations.
- Learn fundamental data manipulation techniques.
- Apply advanced programming concepts such as pointer manipulation, structure usage, and file.

## LISTOFEXPERIMENTS

1.  Programs using I/O statements and expressions

2.  Programs using decision-making constructs

3.  Write a program to find whether the given year is leap year or Not? (Hint: not every centurion year is a leap. For example 1700, 1800 and 1900 is not a leap year)

4.  Design a calculator to perform the operations, namely, addition, subtraction, multiplication,division and square of a number

5.  Check whether a given number is Armstrong number or not?

6.  Given a set of numbers like <10, 36, 54, 89, 12, 27>,

    find sum of weights based on the following conditions
    a) if it is a perfect cube
    b) if it is a multiple of 4 and divisible by 6
    c) if it is a prime number
    d) Sort the numbers based on the weight in the increasing order as shown below <10,its weight>,<36,its weight><89,its weight>

7.  Populate an array with height of persons and find how many persons are above the averageheight.

8.  Given a string —a$bcd./fg‖ find its reverse without changing the position of special characters. (Example input:a@gh%;j and output:j@hg%;a)

9.  Convert the given decimal number into binary, octal and hexadecimal numbers using userdefined functions

10. From a given paragraph perform the following using built-in functions:
    a) Find the total number of words.
    b) Capitalize the first word of each sentence.
    c) Replace a given word with another word

11. a) Sort the list of numbers using Selection sort and insertion sort

   b) Sort the list of numbers using pass by reference

12. Search an element from an unsorted array using linear search Search an element in an array using Binary search recursion call

13. Generate salary slip of employees using structures and pointers

14. Programs using Pointers
    a. Pointer demonstration the use of & and *
    b. Access Elements of an Array Using Pointer
    c. Perform the string operations like Length of the String ,
    d. Concatenation of string and compare the string using Pointer
    e. Count number of words, digits, vowels using pointers
    f. Add two matrices using Multidimensional Arrays with pointers
    g. Multiply two matrices using pointers
    h. Multiply two numbers using Function Pointers

15. Compute internal marks of students for five different subjects using structures and functions

16. Program to demonstrate the difference between unions and structures

17. Insert, update, delete and append telephone details of an individual or a company into a telephone directory using random access file

18. Count the number of account holders whose balance is less than the minimum balance usingsequential access file.

19. **MINI PROJECT**
    Create a Railway reservation system with the following modules

    a. Booking
    b. Availability checking
    c. Cancellation
    d. Prepare chart

**TOTAL:  60 PERIODS**

## COURSE OUTCOMES
Upon successful completion of the course, students will be able to:
**CO1**   Write, test, and debug simple C programs.

**CO2**   Implement C programs with conditionals and loops.

**CO3**   Develop C programs for simple applications making use arrays and strings.

**CO4**   Develop C programs involving functions, recursion, pointers, and structures and union

**CO5**   Design applications using sequential and random access file processing.

**CO6**   Perform task as an individual and / or team member to manage the task in time.

## WEB REFERENCES

1. https://www.programiz.com/c-programming/examples
2. https://beginnersbook.com/2015/02/simple-c-programs/
3. https://www.programmingsimplified.com/c-program-examples
4. https://www.tutorialgateway.org/c-programming-examples/
5. https://www.javatpoint.com/c-programs
6. https://www.tutorialspoint.com/learn_c_by_examples/simple_programs_in_c.htm

**CO-PO MAPPING**

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3   | 3   | 3   | 2   |     |     |     |     |     |      |      |      |
| CO2 | 3   | 2   | 2   | 1   | 3   |     |     |     |     |      |      |      |
| CO3 | 3   | 3   | 3   | 2   | 3   |     |     |     |     |      |      |      |
| CO4 | 3   | 2   | 2   | 1   | 3   |     |     |     |     |      |      |      |
| CO5 | 3   | 3   | 3   | 2   | 3   |     |     |     |     |      |      |      |
| CO6 | 3   | 2   | 2   | 1   | 3   |     |     |     |     |      |      |      |

| Internal Assessment | | End Semester Examination |
|---|---|---|
| **Evaluation of Laboratory Observation, Record** | **Test** | **Practical** |
| **75** | **25** | **100** |
| **60 %** | | **40%** |

| | | L | T | P | C |
|---|---|---|---|---|---|
| **23TA1101** | **HERITAGE OF TAMIL** | 1 | 0 | 0 | 1 |

### UNIT – I      LANGUAGE AND LITERATURE      3

Language Families in India - Dravidian Languages – Tamil as a Classical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land Bakthi Literature Azhwars and N ayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.

### UNIT – II      HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE      3

Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

### UNIT – III      FOLK AND MARTIAL ARTS      3

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

### UNIT –IV      THINAI CONCEPT OF TAMILS      3

Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

### UNIT –V      CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE      3

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India — Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine — Inscriptions & Manuscripts — Print History of Tamil Books

**Total : 15 PERIODS**

| 23TA1101 | தமிழர் மரபு | L | T | P | C |
|----------|-------------|---|---|---|---|
|          |             | 1 | 0 | 0 | 1 |

## மொழி மற்றும் இலக்கியம்

**UNIT – I**  3

இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ் செவ்விலக்கியங்கள் - சங்க இலக்கியத்தின் சமய சார்பற்ற தன்மை - சங்க இலக்கியத்தில் பகிர்தல் அறம் - திருக்குறளில் மேலாண்மைக் கருத்துக்கள் - தமிழ் காப்பியங்கள், தமிழகத்தில் சமண பௌத்த சமயங்களின் தாக்கம் - பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் - தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

## UNIT – II   மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள்   3
## வரை - சிற்பக் கலை

நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - தேர் செய்யும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனையில் திருவள்ளுவர் சிலை - இசைக்கருவிகள் - மிருதங்கம், பறை, வீணை, யாழ், நாதஸ்வரம் - தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.

## UNIT – III   நாட்டுப்புறக் கலைகள் மற்றும் வீர   3
## விளையாட்டுகள்

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஒயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

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**UNIT –IV**       **தமிழர்களின் திணைக் கோட்பாடுகள்**       **3**

தமிழகத்தின் தாவரங்களும், விலங்குகளும் - தொல்கப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் - தமிழர்கள் போற்றிய அறக்கோட்பாடு - சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் - சங்ககால நகரங்களும் துறை முகங்களும் - சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - கடல் கடந்த நாடுகளில் சோழர்களின் வெற்றி.

**UNIT –V**       **இந்திய தேசிய இயக்கம் மற்றும் இந்திய**       **3**
                  **பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு**

இந்திய விடுதலைப் போரில் தமிழர்களின் பங்கு - இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு - கல்வெட்டுகள், கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

**Total : 15 PERIODS**

**TEXT-CUM REFERENCE BOOKS:**

1. தமிழக வரலாறு - மக்களும் பண்பாடும் - கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).

2. கணினித் தமிழ் – முனைவர். இல. சுந்தரம். (விகடன் பிரசுரம்).

3. கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)

4. பொருநை - ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை)

5. Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu)(Published Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)

6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: InternationalInstitute of Tamil Studies

7. Historical by: International Institute of Tamil Studies).

8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)

9. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation,Tamil Nadu)

**10.** Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Publishedby: The Author)

**11.** Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Bookand Educational Services Corporation, Tamil Nadu)

**12.** Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book

| Internal Assessment | | | | End Semester Examinations |
|---|---|---|---|---|
| **Assessment I (100 Marks)** | | **Assessment II (100 Marks)** | | |
| **Individual Assignment / Case Study / Seminar / Mini Project** | **Written Test** | **Individual Assignment / Case Study / Seminar / Mini Project** | **Written Test** | **Written Examinations** |
| 40 | 60 | 40 | 60 | 100 |
| **40%** | | | | **60 %** |

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| 23HS1104 | INTERPERSONAL COMMUNICATION SKILLS I | L | T | P | C |
|---|---|---|---|---|---|
| | | 0 | 0 | 2 | 0 |

## COURSE OBJECTIVES

- To induce the basic reading and writing skills among the first year engineering and technology students.
- To assist the learners to develop their listening skills, which will enable them listening to lectures and comprehend them by asking questions and seeking clarifications
- To succor the learners to develop their speaking skills and speak fluently in real contexts.
- To motivate the learners to develop vocabulary of a general kind by developing their reading skills for meeting the competitive exams like GATE, TOFEL, GRE, IELTS, and other exams conducted by Central and State governments
- To improve your English communication skills in a professional setting

### INTERPERSONAL SKILLS

**Listening**: Listening to Specific Information – About various Professions, Professionals, Work Cultures, Demands of industry and expectation

**Speaking**: Sharing information with friends/colleagues/teachers/employers

**Reading**: Reading Comprehension – About the famous and leading personalities in the industry and various fields as motivation

**Writing**: Writing about personalities in one's own words

**TOTAL : 30  PERIODS**

## TEXT BOOKS

1. Crucial Conversations: Tools for Talking When Stakes Are High by Kerry Patterson, Joseph Grenny, Ron McMillan, and Al Switzler, 2014

2. Simply Said: Communicating Better at Work and Beyond by Jay Sullivan, 2016

**REFERENCE BOOKS**

1. Words That Work: It's Not What You Say, It's What People Hear by Dr. Frank Luntz,2011.
2. The Fine Art of Small Talk: How To Start a Conversation, Keep It Going, Build Networking Skills — and Leave a Positive Impression! By Debra Fine

**WEB REFERENCES**

1. https://unacademy.com/content/upsc/study-material/science-and-technology/famous-personalities-in-science/

**ONLINE COURSES / RESOURCES**

1. https://www.krisamerikos.com/blog/phone-coversation-in-english

**COURSE OUTCOME:**

Upon completion of the course, students will be able to:

**CO1** Comprehend conversation and short talks delivered in English.

**CO2** Participate effectively in informal conversation; introduce themselves and their friends and express opinions English.

**CO3** Read articles of a general kind in magazines and newspaper

**CO4** Write short essays of a general kind and personal letters and emails in English.

**CO5** Gain understanding of basic grammatical structures and use them in right context.

**CO6** Use appropriate words in a professional context.

**CO&PO MAPPING**

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 |  |  |  |  |  |  |  |  | 3 | 3 |  | 2 |
| CO2 |  |  |  |  |  |  |  |  | 3 | 3 |  | 2 |
| CO3 |  |  |  |  |  |  |  |  | 2 | 3 |  | 2 |
| CO4 |  |  |  |  |  |  |  |  | 2 | 3 |  | 2 |
| CO5 |  |  |  |  |  |  |  |  | 2 | 3 |  | 2 |
| CO6 |  |  |  |  |  |  |  |  | 3 | 3 |  | 2 |

| 23HS1105 | QUANTITATIVE APTITUDE PRACTICES I | L | T | P | C |
|----------|-----------------------------------|---|---|---|---|
|          |                                   | 0 | 0 | 1 | 0 |

## COURSE OBJECTIVE:

- To strengthen students understanding of number systems, algebra and assist them in developing their problem-solving skills.
- To get the abilities needed to address challenges with quantitative aptitude.

**Module 1      Number system**

Numbers - HCF and LCM- simplification - square root  -  cube root.

**Module 2      Algebra**

Algebra - decimal fraction - arithmetic progression - geometric progression.

**Module 3      Blood relations**

Blood relations - pattern sequence - alphabet test question – clocks-calenders.

**Module 4      Data Interpretation**

Table chart- pie chart  - bar chart - line charts

**3**

**3**

**3**

**3**

**TOTAL : 12 PERIODS**

## COURSE OUTCOME:

Upon completion of the course, students will be able to:

**CO1**   Demonstrate solid understanding to address number system and algebraic problems.

**CO2**   Handle problems with the blood relations and data interpretation.

## TEXT BOOKS:

1. Aggarwal R.S.(2017).Quantitative Aptitude for Competitive Examinations 3rd edition New Delhi: S.Chand Publishing.
2. Abhijit guha(2016). Quantitative Aptitude for All Competitive Examinations, 6th edition. Noida : Mc GrawHill Education Pvt .Ltd.
3. FACE.(2016).Aptipedia Aptitude Encyclopedia1(Ed.).New Delhi: Wiley Publications.

## REFERENCE BOOK:

1. Sharma arun. (2016).Quantitative aptitude,7th(Ed.).Noida : McGrawHill Education Pvt. Ltd.
2. Praveen. R.V 3rd edition, Quantitative aptitude and reasoning, PHI learning publication.

## WEB REFERENCES:

https:// www.indiabix.com

**Mode of Evaluation: Online Test**

| 23MA1201 | COMPLEX VARIABLES AND LAPLACE TRANSFORM | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 1 | 0 | 4 |

**COURSE OBJECTIVE:**

- To solve the linear differential equations with constant coefficients.
- To help the engineering students with vectors as it gives the insight into how to trace along the different types of curves.
- To develop an understanding of the standard technique of a complex variable theory in particular of analytics functions and its mapping property.
- Complex variable techniques have been used in wide areas of engineering.
- Laplace Transform gives the basic idea to solve the problems in engineering and technology.

**UNIT - I          ORDINARY DIFFERENTIAL EQUATIONS          9+3**

Higher order linear differential equations with constant coefficients -Method of variation of parameters – Homogenous equation of Euler"s and Legendre"s type – System of simultaneous first order linear differential equations with constant coefficients

**UNIT - II          VECTOR CALCULUS          9+3**

Gradient, divergence and curl – Directional derivative – Irrotational and solenoidal vector fields – Vector integration – Green's theorem in a plane - Gauss divergence theorem and Stokes' theorem (excluding proofs) – Simple applications involving cubes, rectangular parallelopiped,**.**

**UNIT - III          ANALYTIC FUNCTIONS          9+3**

Functions of a complex variable–Analytic functions -Cauchy-Riemann equations – Necessary and sufficient conditions–Harmonic and orthogonal properties of analytic function – Harmonic conjugate – Construction of analytic functions by Milne Thomson method– Conformal mapping:  w =z+c, cz, 1/z and bilinear transformation.

**UNIT - IV          COMPLEX INTEGRATIONS          9+3**

Line integrals- Cauchy's integral theorem-Cauchy's integral formula - Singularities – Residues– Cauchy's residue theorem - Taylor's and Laurent's series expansions ––– Application of residue theorem for evaluation of real definite integrals – Use of circular contour and semi- circular contour (excluding poles on the real axis).

**UNIT - V**                               **LAPLACE TRANSFORM**                               **9+3**

Laplace transform – Sufficient condition for existence – Transform of elementary functions – Basic properties–Transforms of derivatives and integrals of functions-Derivatives and integrals of transforms - Transforms of unit function, unit step function and unit impulse functions – Transform of periodic functions– Initial and final value theorems. Inverse Laplace transform -Convolution theorem–Solution of linear ODE of second order with constant coefficients using techniques of Laplace transformation.

**TOTAL :   60 PERIODS**

**COURSE OUTCOME(S):**

Upon completion of the course, students will be able to:

**CO1**   Apply various techniques in solving differential equations.
**CO2**   Identify the gradient , divergence and curl of a vector point function and related identities. Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.
**CO3**   Understand the concepts of analytic functions, harmonic functions and conformal mapping.
**CO4**   Determine the types of singularities, residues and contour integration.
**CO5**   Able to solve differential equations using Laplace transform.

**TEXT BOOKS:**

1.  Grewel. B.S, "Higher Engineering Mathematics", 43rd Edition, Khanna Publications, Delhi, 2014.

2.  B.V. Ramana, " Higher Engineering Mathematics", McGraw Hill Education, India.

3. Bali N., Goyal M. and Walkins C., "Advanced Engineering Mathematics", Firewall Media (An imprint  of Lakshmi Publications Pvtt. Ltd.,), New Delhi, 7th Edition, 2009.

**REFERENCE BOOKS:**

1.Kreyszig Erwin, Advanced Engineering Mathematics", John wiley and Sons, 10th Edition, New Delhi.

2. Jain R.K. and Iyengar S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi,  3rd  Edition, 2007.

3. O'Neil, P.V. "Advanced Engineering Mathematics", Cengage Learning India Pvt. Ltd, New Delhi, 2007.

4. Sastry, S.S, "Engineering Mathematics", Vol.I& II, PHI LearnigPvt. Ltd, 4th Edition, New    Delhi, 2014.

5. Wyile, R.C. and Barrett, L.C., "Advanced Engineering Mathematics "Tata McGraw Hill Education Pvt Ltd, 6thEdition, New Delhi, 2012.

## CO-PO MAPPING

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 3 |  |  |  |  |  |  |  |  | 1 |
| **CO2** | 3 | 3 | 3 |  |  |  |  |  |  |  |  | 1 |
| **CO3** | 3 | 3 | 3 |  |  |  |  |  |  |  |  | 1 |
| **CO4** | 3 | 3 | 3 |  |  |  |  |  |  |  |  | 1 |
| **CO5** | 3 | 3 | 3 |  |  |  |  |  |  |  |  | 1 |

| Internal Assessment | | | | End Semester Examinations |
|---|---|---|---|---|
| **Assessment I (100 Marks)** | | **Assessment II (100 Marks)** | | |
| **Individual Assignment / Case Study / Seminar / Mini Project** | **Written Test** | **Individual Assignment / Case Study / Seminar / Mini Project** | **Written Test** | **Written Examinations** |
| 40 | 60 | 40 | 60 | 100 |
| **40%** | | | | **60 %** |

| | | L | T | P | C |
|---|---|---|---|---|---|
| **23ME1201** | **ENGINEERING MECHANICS** | 3 | 0 | 0 | 3 |

**COURSE OBJECTIVE:**

- To understand the concepts of resultant force and moment of a particle and rigid body in 2D and 3D.
- To enable the students to be exposed of Analysis of Frames and Trusses.
- To understand the concepts of centroid, moment of inertia and mass moment of inertia.
- To understand the concepts of kinematics and kinetics of particles and rigid bodies.
- To develop capacity to predict the effect of frictional force and its applications.

**UNIT I**                     **BASICS AND STATICS OF PARTICLES**           **9**

Introduction - Units and dimensions – Fundamental laws of Mechanics - Principle of transmissibility - Parallelogram and triangular Law of forces - Vectorial representation of forces - Vector operations of forces - Coplanar Forces - Rectangular components of force - Equilibrium of a particle - Lami's theorem – Forces in space system - Equilibrium of a particle in space – Equivalent systems of forces.

**UNIT II**      **STATICS OF RIGID BODIES AND ANALYSIS OF TRUSSES AND**      **9**
                                      **FRAMES**

Moments and Couples – Moment of a force about a point and about an axis – Varignon's theorem – moment of a couple - resolution of a force into a force and a couple - reduction of a system of forces - Single equivalent force - Free body diagram – Types of supports and their reactions – Equilibrium of Rigid bodies in 2D and 3D – Case studies.

Simple trusses - Method of joints, method of sections - joints under special loading conditions - space trusses - Analysis of frames.

**UNIT III**                 **PROPERTIES OF SURFACES AND SOLIDS**         **9**

Centroid of areas – simple and composite areas - Theorems of Pappus and Guldinus – Centre of mass – simple and composite volumes - Moment of inertia - simple and composite areas - Parallel axis theorem and perpendicular axis theorem - Polar moment of inertia - Radius of gyration – Product of inertia - Principal moment of inertia of plane areas - Mass moment of inertia of simple solids.

**UNIT IV**                   **FRICTION AND ITS APPLICATIONS**           **9**

Friction -Laws of dry friction - Angle of friction - Coefficient of static and kinetic friction – Sliding friction - Wedges – Ladder Friction - Surface contact friction Sliding and Rolling friction – Friction drives – Friction in screw threads – Bearings and lubrication – Friction clutches – Belt drives – Friction in brakes- Band and Block brakes - case studies.

**UNIT V** **DYNAMICS OF PARTICLES** **9**

Kinematics - Translation and Rotation of Rigid Bodies – Velocity and acceleration -General Plane motion of simple rigid bodies such as cylinder and sphere - Rectilinear Motion and Curvilinear Motion of Particles - Equations of Motions - Projectile Motion.

Kinetics - Newton's Second Law of Motion – D'Alembert's Principle – - Energy - potential energy - kinetic energy - conservation of energy - work done by a force - work energy method.

Concept of conservation of momentum - Impulse-Momentum principle - Impact - Direct central impact, oblique central impact, impact of a moving train on the spring board.

**TOTAL :45 PERIODS**

**COURSE OUTCOME**

Upon completion of the course, students will be able to:

**CO1** Understand the concepts of equilibrium of particles and rigid bodies in 2D and 3D.
**CO2** Analyze the support reactions and equilibrium of Frames and Trusses.
**CO3** Evaluate the centroid, moment of inertia and mass moment of inertia of composite areas and volumes.
**CO4** Understand the concepts of friction and its applications.
**CO5** Apply the equations of linear and projectile motions to solve physical problems.

**TEXT BOOKS:**

- Beer F.P and Johnston Jr. E.R, "Vector Mechanics for Engineers (In SI Units): Statics and Dynamics", 8th Edition, Tata McGraw-Hill Publishing Company, New Delhi, 2019.
- Rajasekaran S and Sankarasubramanian G, "Engineering Mechanics Statics and Dynamics", 3rd Edition, Vikas Publishing House Pvt. Ltd., 2005.
- Balasubramaniam T.V and Murugan R, "Engineering Mechanics", 1st Edition, Vijay Nicole Imprints, 2015.

**REFERENCE BOOKS:**

1. Irving H. Shames and Krishna MohanaRao G., "Engineering Mechanics - Statics and Dynamics", 4th Edition, Pearson Education, 2006.
2. Hibbeller R.C and Ashok Gupta, "Engineering Mechanics: Statics and Dynamics", 11th Edition, Pearson Education, 2010.
3. Meriam J.L and Kraige L.G, "Engineering Mechanics - Statics - Volume 1, Dynamics Volume 2", 3rd Edition, John Wiley & Sons,1993.
4. Bhavikatti S.S and Rajashekarappa, K.G, "Engineering Mechanics", New Age International (P) Limited Publishers, 2021.
5. Vela Murali, "Engineering Mechanics", Oxford University Press, 2018.

**WEB REFERENCES:**

1. http://www.iitg.ac.in/rkbc/me101/me101.htm
2. https://ocw.mit.edu/courses/civil-and-environmental-engineering/1-050-engineering-mechanics-i-fall-2007/index.htm
3. http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html.

## ONLINE COURSES / RESOURCES:

1.  https://nptel.ac.in/courses/112/106/112106286/
2.  https://nptel.ac.in/courses/122/104/122104015/

## CO-PO MAPPING

|      | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1  | 3   | 3   | 3   | 3   | 3   | 2   | -   | -   | -   | -    | -    | -    |
| CO2  | 3   | 3   | 3   | 3   | 3   | 2   | -   | -   | -   | -    | -    | -    |
| CO3  | 3   | 3   | 3   | 3   | 3   | 2   | -   | --  | -   | -    | -    | -    |
| CO4  | 3   | 3   | 3   | 3   | 3   | 2   | -   | -   | -   | -    | -    | -    |
| CO5  | 3   | 3   | 3   | 3   | 3   | 2   | -   | -   | -   | -    | -    | -    |

| Internal Assessment | | | |
|---|---|---|---|
| Assessment I (100 Marks) | | Assessment II (100 Marks) | |
| Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Individual Assignment / Case Study / Seminar / Mini Project | Written Test |
| 40 | 60 | 40 | 60 |
| **100%** | | | |

| 23ES1205 | BASIC ELECTRICAL ENGINEERING | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 3 |

**COURSE OBJECTIVE**:

- To learn the concepts related with Electrical circuits and Wiring.

- To understand basics of Semiconductor Devices and Instrumentation

- To Study the working principles of Special machines.

- To study the concept of DC and AC Drives.

- To understand the concepts of Solar PV system and Hybrid Electric Vehicle

**UNIT - I**               **BASIC CIRCUITSAND WIRING**               **9**

Electrical quantities, Ohms Law, Kirchhoff's Laws -Series and Parallel Connections - Single phase and three phase system, Earthing and its types- Basic house wring and its types – safety measures at home and industry.

**UNIT - II**          **SEMICONDUCTOR DEVICES AND MEASURING**          **9**

**INSTRUMENTS**

PN junction diode,-Zener diode–Half wave and Full wave rectifier,- Bipolar Junction transistors. Classification of instruments –Operating Principles of indicating Instruments– Moving iron, Moving coil and wattmeter.

**UNIT - III**               **DC DRIVES**               **9**

Construction and working Principles of DC Motors, Starters, Armature and Field control, Speed control using controlled rectifiers and DC choppers

**UNIT - IV**          **AC DRIVES AND SPECIAL MACHINES**          **9**

AC Drives: Construction and working Principles of Three phase Induction motor and synchronous Motor, voltage / frequency control. Special Machines: Construction and working of Brushless dc motor, Permanent magnet DC Motor, stepper motor

**UNIT - V**          **SOLAR PV SYSTEM AND ELECTRIC VEHICLE**          **9**

Solar PV system- Introduction-Comparison with electrical and hybrid electrical vehicle-Construction and working of PHEV-Block diagram and components-Charging mechanisms-Advantages of PHEVs-Solar and Battery powered Electric Vehicles

**TOTAL :   45 PERIODS**

**COURSE OUTCOME(S):**

Upon completion of the course, students will be able to:

**CO1**      Acquire basic knowledge on Basic Electrical circuits and House Wiring

**CO2**      Acquire basic knowledge on semiconductor devices and Measuring Instruments

**CO3**      Explain the working principle and applications of DC and AC Drives

**CO4**      Explain the working principle of Special Electrical Machines

**CO5**      Illustrate the concepts related in the Solar PV system and Hybrid Electric Vehicles

**TEXT BOOKS**:

1. A.K. Sawhney, Puneet Sawhney_ A Course in Electrical &Electronic Measurements &49 Instrumentation', Dhanpat Rai and Co,NewDelhi,2015.

2. KothariDP and I.JNagrath,—Basic Electrical and Electronics Engineering ‖, Second Edition, McGraw Hill Education,2020.

3. Advanced Electric Drive Vehicles, Ali Emadi, CRC Press, First edition 2017.

4. Vedam Subrahmaniam, —Electric Drives (Concepts and Applications) ‖, Tata McGraw-Hill, 2010

5. Nagrath.I.J.&Kothari.D.P,—Electrical Machines ‖,TataMcGraw-Hill,2006

**REFERENCE BOOKS**:

1. Pillai.S.K—A First Course on Electric Drives ‖,Wiley Eastern Limited,2012.

2. Singh.M.D.,K.B.Khanchandani,—PowerElectronics‖,TataMcGrawHill,2012.

3. KothariDP and I.JNagrath,—Basic Electrical Engineering ‖, Fourth Edition, McGrawHill Education,2019.

4. Mehrdad Ehsani,YiminGao, SebastianE. Gay, Ali Emadi, 'Modern Electric, Hybrid Electric and Fuel Cell Vehicles: Fundamentals, Theory and Design', CRCPress,2004

**WEB REFERENCES**:

1. https://electrical-engineering-portal.com/download-center/books-and-guides/electrical- engineering/basic-course

2. https://afdc.energy.gov/vehicles/how-do-all-electric-cars-work

**ONLINE COURSES / RESOURCES**:

1. https://archive.nptel.ac.in/courses/117/106/117106108/
2. https://archive.nptel.ac.in/courses/108/105/108105155/
3. https://archive.nptel.ac.in/courses/108/104/108104140/
4. https://onlinecourses.nptel.ac.in/noc22_ee53/preview

## CO-PO MAPPING

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 3 | 2 | 2 | 2 | 1 |  | 1 |  |  |  |  | 1 |
| CO2 | 3 | 2 | 2 | 2 | 1 |  | 1 |  |  |  |  | 1 |
| CO3 | 3 | 2 | 2 | 2 | 1 |  | 1 |  |  |  |  | 1 |
| CO4 | 3 | 2 | 2 | 2 | 1 |  | 1 |  |  |  |  | 1 |
| CO5 | 3 | 2 | 2 | 2 | 2 |  | 1 |  |  |  |  | 2 |

| Internal Assessment | | | | End Semester Examinations |
|---|---|---|---|---|
| Assessment I (100 Marks) | | Assessment II (100 Marks) | | |
| Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Written Examinations |
| 40 | 60 | 40 | 60 | 100 |
| **40%** | | | | **60 %** |

| 23HS1203 | COMMUNICATIVE ENGLISH AND LANGUAGE SKILLS II | L | T | P | C |
|----------|---------------------------------------------|---|---|---|---|
|          |                                             | 2 | 0 | 2 | 3 |

## COURSE OBJECTIVE:

- To develop linguistic and strategic competence in workplace context and to enhance language proficiency and thereby the employability of budding engineers and technologists.

- Toimprovetherelevantlanguageskillsnecessaryforprofessionalcommunication
- To help learners to develop their listening skills, which will, enable them to listen to lectures and comprehend them by asking questions; seeking clarification and developing their speaking skills and to speak fluently in real contexts.

- To improve the verbal ability skill and communicative skill of the students.
- Topreparethemforvariouspublicandprivatesectorexams&placementdrives.

**UNIT I**  **INTERPERSONAL COMMUNICATION**  **6**
**Listening**: Listening to Telephone Etiquettes and Conversations. **Speaking**: Role Play ExercisesBased on Workplace Contexts, Introducing Oneself - PEP Talks. **Reading**: Reading the Interview of an Achiever and Completing Exercises (Skimming, Scanning and Predicting). **Writing**: Writing aShort Biography of an Achiever Based on Given Hints, **Grammar**: Punctuation, Numerical Expressions and Sentence pattern. **Vocabulary Development**: Idioms and Phrases

**ACTIVITY**: Writing and speaking about achievements of eminent personalities

**UNIT II**  **TECHNICAL COMMUNICATION**  **6**
**Listening**: Listening to Talks/Lectures Both General and Technical and Summarizing the Main Points. **Speaking**: Participating in Debates, TED Talks.**Reading**: Reading Technical Essays/ Articles and Answering Comprehension Questions.**Writing**: Summary Writing, Minutes of the meeting. **Grammar**: Prepositional Phrases and Relative Clauses.**Vocabulary Development:** Abbreviations and Acronyms.

**ACTIVITY**: Reading transcripts of TED Talks and presenting them

**UNIT III**                         **PROCESS DESCRIPTION**                 **6**

**Listening**: Listening to a Process Description and Drawing a Flowchart. **Speaking**: Participating in

Group Discussions, Giving Instructions, Presentation. **Reading**: Reading Instruction Manuals **Writing**: Process Descriptions – Writing Instructions **Grammar**: Use of Imperatives, Order of Adjectives, Impersonal Passive Voice and Phrasal verbs **Vocabulary Development**: Misspelt words. Homophones and Homonyms.

**ACTIVITY**: Reading Newspaper articles and presenting them

**UNIT IV**                         **REPORT WRITING**                    **6**

**Listening**: Listening to a Presentation and Completing Gap-Filling Exercises. **Speaking**: Making Formal Presentations, **Reading**: Reading and Interpreting Charts/Tables and diagrams. **Writing**: Interpreting Charts/Tables and Diagrams, Writing a Report. **Grammar**: Reported Speech; Interrogatives- Question Tags and Articles – omission of articles **Vocabulary Development**: Technical Jargon

**ACTIVITY:** Presentation on Technical and non-technical topics of interests with reference to IELTS

**UNIT V**                         **INTERVIEW SKILLS**                  **9**

**Listening**: Listening to a Job Interview and Completing Gap-Filling Exercises **Speaking**: Mock Interview, Telephone Interviews & Etiquette, and Group Discussion. **Reading: Reading** a Job Interview, SOP, Company Profile and Completing Comprehension Exercises **Writing**: Job Applications and Resume. **Grammar**: Conditional Clauses, Modal verbs, Verbal Analogy.**Vocabulary Development:** Technical Vocabulary, Purpose Statement

**ACTIVITY:** Preparing an effective Resume' and participating in Mock interview.

                                                      **TOTAL :30 PERIODS**

**COURSE OUTCOME**

Upon completion of the course, students will be able to:

**CO1**     Recognise the need for life skills; apply them to different situations, the basic

           communication practices in different types of communication

**CO2**     Gain confidence to communicate effectively in various situations to acquire

           employability skills.

**CO3** Develop knowledge, skills, and judgment around human communication that facilitate their ability to work collaboratively with others

**CO4** Communicate effectively & appropriately in real life situation and enhance student's problem solving skill

**CO5** Prepare for various public and private sector exams & placement drives.

## TEXT BOOKS:

1. Board of Editors. English for Engineers and Technologists Volume 2 Orient Black Swan Limited, 2020

2. Richards, C. Jack. Interchange, New Delhi: CUP, 2017

3. Aggarwal R.S. Quantitative Aptitude for Competitive Examinations 3rd (Ed.) New Delhi: S.Chand Publishing, 2017.

## REFERENCE BOOKS:

1.Kumar, Suresh. E. Engineering English. Orient Blackswan: Hyderabad,2015

2. Raman, Meenakshi and Sharma, Sangeetha- Technical Communication Principles and Practice. Oxford University Press: New Delhi, 2014.

3. Grussendorf, Marion, English for Presentations, Oxford University Press, Oxford: 2007.

4. Means, L. Thomas and Elaine Langlois, English & Communication For Colleges.

Cengage Learning, USA: 2007.

## WEB REFERENCES:

1. https://learnenglishteens.britishcouncil.org/exams/grammar-and-vocabulary exams / word formation

2. https://cdn.s3waas.gov.in/s347d1e990583c9c67424d369f3414728e/uploads/2018

3. http://xn--englishclub-ql3f.com/grammar/parts-of-speech.htm

4. https://www.edudose.com/english/grammar-degree-of-comparison-rules/

## ONLINE COURSES / RESOURCES:

1. https://basicenglishspeaking.com/wh-questions/

2. https://agendaweb.org/verbs/modals-exercises.html

# LANGUAGE SKILLS LAB                    30 Hours

## LIST OF EXPERIMENTS

1. Speaking- Sharing personal information- Self introduction

2. Speaking- Group Discussion, Small talk or Peb Talk

3. Speaking- Presentation- Formal and Informal

4. Speaking- Mock Interview

5. Speaking- FAQ"s on Job Interview

6. Speaking – JAM

7. Speaking- Debate and Story Narration

8. Writing: Error Detection- Spotting and reasoning the errors from the passages in competitive exams.

9. Writing: Letter of recommendation

10. Writing: Elements of a good essay

11. Writing: Types of essays. Descriptive – Narrative-Issue based.

## REFERENCE:

1. Kumar, Suresh. E. Engineering English. Orient Blackswan: Hyderabad,2015

2. Raman, Meenakshi and Sharma, Sangeetha- Technical Communication Principles and Practice. Oxford University Press: New Delhi, 2014.

3. Grussendorf, Marion, English for Presentations, Oxford University Press, Oxford: 2007.

4. Means, L. Thomas and Elaine Langlois, English & Communication For Colleges. Cengage Learning, USA: 2007.

5. Sharma Arun. Quantitative Aptitude, 7th (Ed.). Noida: McGraw Hill Education Pvt. Ltd.(2016)

## CO-PO MAPPING

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | | | | | | | | | 3 | 3 | | 2 |
| **CO2** | | | | | | | | | 3 | 3 | | 2 |
| **CO3** | | | | | | | | | 2 | 3 | | 2 |
| **CO4** | | | | | | | | | 2 | 3 | | 2 |
| **CO5** | | | | | | | | | 2 | 3 | | 2 |
| **CO6** | | | | | | | | | 3 | 1 | | 3 |

| Assessment I (40% weightage) (Theory Component) | | Assessment II (60% weightage) (Laboratory Component) | | End Semester Examination |
|---|---|---|---|---|
| **Individual Assignment / Case Study / Seminar / Mini Project** | **Written Test** | **Evaluation of Laboratory Observation, Record** | **Test** | **Written Examination** |
| **40** | **60** | **75** | **25** | |
| **100** | | | | **100** |
| **50 %** | | | | **50 %** |

| 23ES1203 | FUNDAMENTALS OF PYTHON PROGRAMMING | L | T | P | C |
|---|---|---|---|---|---|
| | | 2 | 0 | 0 | 2 |

**COURSE OBJECTIVE:**

- To know the basic programming constructs
- To use control structures in python
- To use python collections–Lists, Tuples and Dictionary
- To define Python functions and use Strings
- To learn about strings and its manipulations in Python

**UNIT I          INTRODUCTIONTOPYTHONPROGRAMMING          6**

Introduction to Python, Demo of Interactive and script mode, Tokens in Python ― Variables,Keywords,Comments,Literals,Datatypes,Indentation,Operatorsanditsprecedence,Expressions,InputandPrintfunctions,TypeCasting.

**UNIT II          CONTROLSTRUCTURES          6**

Control Structures: Selective statements– if, if -else, nested if, if–elif ladder statements; Iterative statements -while, for, range functions, nested loops, else in loops, break, continue and pass statements.

**UNIT III          COLLECTIONS          6**

List: Create, Access, Slicing, Negative Indices, List Methods, and comprehensions Tuples: Create, Indexing and Slicing, Operations on tuples.

Dictionary: Create, add, and replace values, operations on dictionaries. Sets: Create and operations on set.

**UNIT IV          FUNCTIONS          6**

Functions: Types, parameters, arguments: positional arguments, keyword arguments, parameters with default values, functions with arbitrary arguments, Scope of variables: Local and global scope, Recursion functions.

**UNIT V          STRINGS          6**

Strings: Formatting, Comparison, Slicing, Splitting, Stripping, Negative indices, String functions, Regular expression: Matching the patterns, Search and replace**.**

**TOTAL :30 PERIODS**

**COURSE OUTCOME**

Upon completion of the course, students will be able to:

**CO1          Understand the basic python programming constructs**

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| **CO2** | Develop and execute simple Python programs |
| **CO3** | Write simple Python programs using conditionals and loops for solving problems. |
| **CO4** | Represent compound data using Python lists, tuples, dictionaries etc. |
| **CO5** | Develop programs using functions. |
| **CO6** | Develop programs using string functions. |

## TEXT BOOKS:

1. Paul Deitel and Harvey Deitel,— Python for Programmers ‖, Pearson Education, 1st Edition, 2021.
2. Reema Thareja,‖ Problem Solving and Programming with Python", 2nd edition, Oxford University Press, New Delhi,2019.

## REFERENCE BOOKS:

1. MartinC.Brown,—Python: The Complete Reference ‖, 4thEdition,Mc-GrawHill,2018
2. Eric Matthes, —Python Crash Course, A Hands - on Project Based Introduction to Programming‖, 2ndEdition, No StarchPress,2019

## ONLINE COURSES / RESOURCES:

1. https://docs.python.org/3/tutorial/
2. https://www.w3schools.com/python/
3. https://www.tutorialspoint.com/python/index.htm
4. https://www.javatpoint.com/python-tutorial
5. https://nptel.ac.in/courses/

**LANGUAGE SKILLS LAB**                    **30 Hours**

**LIST OF EXPERIMENTS**

1. Basic Python Programs
2. Write programs to demonstrate different number data types in python
3. Develop python programs to demonstrate various conditional statements
4. Implement user defined functions using python
5. Develop pythons cripts to demonstrate built-in functions
6. Develop python programs to perform various string operations like slicing, indexing &formatting
7. Develop python programs to perform operations on List & Tuple
8. Demonstrate the concept of Dictionary with python programs
9. Develop python programs to perform operations on Sets.
10. Write a python program to find and replace all occurrences of one word with another

## CO-PO MAPPING

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1 | 2 | 2 | 2 |  | 2 |  |  |  | 3 |  |  | 2 |
| CO2 | 2 | 2 | 2 |  | 2 |  |  |  | 3 |  |  | 2 |
| CO3 | 2 | 2 | 2 |  | 2 |  |  |  | 2 |  |  | 2 |
| CO4 | 2 | 2 | 2 |  | 2 |  |  |  | 2 |  |  | 2 |
| CO5 | 2 | 2 | 2 |  | 2 |  |  |  | 2 |  |  | 2 |
| CO6 | 2 | 2 | 2 |  | 2 |  |  |  | 3 |  |  | 3 |

| Assessment I (40% weightage) (Theory Component) | | Assessment II (60% weightage) (Laboratory Component) | | End Semester Examination |
|---|---|---|---|---|
| Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Evaluation of Laboratory Observation, Record | Test | Written Examination |
| 40 | 60 | 75 | 25 | |
| 100 | | | | 100 |
| 50 % | | | | 50 % |

| | | **L** | **T** | **P** | **C** |
|---|---|---|---|---|---|
| **23ES1212** | **TECHNICAL SKILL PRACTICES  I** | **0** | **0** | **2** | **1** |

## COURSE OBJECTIVE:
- To impart essential problem solving skills through general problem solving concepts.
- To provide basic knowledge on programming essentials using C as implementation tool.
- To introduce various programming methods using C.

### LIST OF EXPERIMENTS

1. Data Types, Variables, Operators
2. Expressions, Precedence , Operators
3. Conditional Statements , Switch Statements
4. Looping, Nested Loops
5. Problems on Bit Manipulation
6. Patterns
7. Number Problems
8. Array Basics , Static vs Dynamic Array, Two Dimensional Matrix
9. Structure , Union ,Storage Classes
10. Function , Parameters passing
11. Recursion
12. Strings
13. Pointers
14. Command Line Arguments, Pre-processors
15. File Handling & Exception Handling.

**TOTAL: 30 PERIODS**

## COURSE OUTCOME(S):
Upon successful completion of the course student will be able to:

**CO1** Propose solutions for a given problem.
**CO2** Infer the fundamental programming elements in C language and learn to apply basic control structures in C.
**CO3** Demonstrate the applications of structures and unions.
**CO4** Visualize the capabilities of modular programming approach in C.
**CO5** Understand the basic principles of pointers and their association during implementations.
**CO6** Apply various input, output and error handling functions in C.

## TEXT BOOKS:

1. ReemaThareja, ``Programming in C"", 2nd edition, OXFORD University Press, New Delhi, 2019.
2. Paul Deitel and Harvey Deitel, "C How to Program", Seventh edition, Pearson Publication,2016.

**REFERENCES BOOKS:**
1.   Stephen G. Kochan, "Programming in C", 3rd edition, Pearson Education,2014.
2.   Herbert Schildt, "C: The Complete Reference", Fourth Edition, McGraw Hill, 2000.

**ONLINE COURSES / RESOURCES:**
1.   https://www.javatpoint.com/c-programming-language-tutorial
2.   https://www.tutorialspoint.com/cprogramming/
3.   https://nptel.ac.in/Courses/

| | | L | T | P | C |
|---|---|---|---|---|---|
| **23ES1213** | **PRODUCT DEVELOPMENT LABOATORY** | 0 | 0 | 4 | 2 |

## COURSE OBJECTIVE

- Fabrication of pipe line with various pipe fittings and Making simple Joints in woods.

- Making joints in wood materials used in common household wood work.

- Create simple mechanical operations like welding, machining and sheet metal fabrications.

- Identifying various parts of simple mechanical machines like centrifugal pump and Window Air conditioner and learning foundry operations.

- Understanding basics of Electrical and Electronics Engineering.

**GROUP – A**                    **CIVIL & ELECTRICAL ENGINEERING**

**CIVIL ENGINEERING PRACTICES**                                  **15 hours**

**Plumbing Work**:

1) Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in household.

2) Preparing plumbing line sketches.

3) Laying pipe connection to the suction side and delivery side of a pump

4) Connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances.

**Wood Work**:

1) Introduction to Tools and Equipments

2) Simple Planning and sawing practice

3) Making Half Lap, Dovetail, Mortise and Tenon joints

**Wood Work Study**:

1) Studying joints in door panels and wooden furniture

2) Studying common industrial trusses using models.

**ELECTRICAL ENGINEERING PRACTICES**                              **15 hours**

1) Residential house wiring using switches, fuse, indicator, lamp and energy meter.

2) Fluorescent lamp wiring.

3) Stair case wiring

4) Measurement of electrical quantities – voltage, current, power & power factor in RLC circuit.

5) Measurement of energy using single phase energy meter.

6) Soldering practice – Components Devices and Circuits – Using general purposePCB.

## GROUP – B      MECHANICAL AND ELECTRONICS

**MECHANICAL ENGINEERING PRACTICES**                                    **15  hours**

**Sheet Metal Work**:

1) Demonstrating basic sheet metal operations

2) Making simple sheet metal objects like trays, funnels etc.

**Basic Machining Work**:

1) Introduction to Lathe, Dilling machine, Tools and Equipments

2) Simple Turning and facing

3) Step turning

4) Simple Drilling and Tapping of flat plate using drilling machine

**Foundry Work**:

1) Introduction to tools, equipments and basic operations  used in Foundry

**Welding Work**:

1) Introduction to Arc welding and Gas welding Tools and Equipment

2) Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.

**Introduction to 3D Printing**

1) Introduction to layer thickness, wall thickness and nozzle temperature

2) Making a simple box

## GROUP – B      MECHANICAL AND ELECTRONICS

**ELECTRONICS ENGINEERING PRACTICES**                                    **15 hours**

1) Study of Electronic components and equipments – Resistor colour coding

2) Measurement of AC signal parameter (peak-peak, rms period, frequency) using CRO.

3) Design of Half wave and Full wave Rectifier.

4) 2D & 3D Electrical wiring Model using suitable Software.

                                                                        **TOTAL :  60 PERIODS**

## COURSE OUTCOME

Upon successful completion of the course, students will be able to:

**CO1**    Understand the function of pipe fittings and use of Plumbing tools.

**CO2**    Understand the use of carpentry tools and fabrication of wooden joints.

**CO3**    Apply machining principles in lathe and drilling machines.

**CO4** Analyse the basic electronic circuits and to solder simple components on PCB and test simple electronic circuits.

**CO5** Design and Construction of basic Electrical wiring model.

## TEXT BOOKS

1. Jeyapoovan T., Saravanapandian M. &Pranitha S., "Engineering Practices Lab Manual", VikasPuplishing House Pvt.Ltd, (2014)
2. Kannaiah P. &Narayana K.L., "Manual on Workshop Practice", Scitech Publications, (2011).
3. Jeyachandran K., Natarajan S. &Balasubramanian S., "A Primer on Engineering Practices Laboratory", Anuradha Publications, (2007).

## REFERENCE BOOKS

1. K.C. John, "Mechanical workshop practice", Second edition, PHI learning Pvt Ltd, New Delhi.(2010)
2. Bawa H.S., "Workshop Practice", Tata McGraw – Hill Publishing Company Limited, (2017)

## WEB REFERENCES

1. https://nptel.ac.in/courses/112/107/112107090/

2. https://nptel.ac.in/courses/112/107/112107084/

|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 2 | 2 | - | - | - | - | 1 | - | - | - | - |
| **CO2** | 2 | 2 | 2 | - | - | - | - | 1 | - | - | - | - |
| **CO3** | 2 | 2 | 2 | - | - | - | - | 1 | - | - | - | - |
| **CO4** | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - |
| **CO5** | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - |

| Internal Assessment | | End Semester Examination |
|---|---|---|
| **Evaluation of Laboratory Observation, Record** | **Test** | **Practical** |
| 75 | 25 | 100 |
| **60 %** | | **40%** |

| 23ES1214 | ELECTRICAL ENGINEERING LABORATORY | L | T | P | C |
|----------|-----------------------------------|---|---|---|---|
|          |                                   | 0 | 0 | 4 | 2 |

## COURSE OBJECTIVE

- To understand the characteristics of semiconductor devices
- To determine the characteristics of DC and AC machines
- To enable the students to be familiar with the speed control of DC Motors

### LISTOFEXPERIMENTS

1. Load test on DC Shunt and Series motor.

2. Load test on compound Motor

3. Speed control of DC shunt motor.

4. V curves and inverted V curves of synchronous Motor

5. Load test on three phases quirrel cage Induction motor.

6. Study of DC & AC Starters

7. Characteristics of Semiconductor diode and Zener diode

8. Characteristics of a NPN Transistor under common emitter, common collector and common base configurations

9. Simulation on motoring operation of DC motor

10. Simulation of Speed control of Dc motors using controlled rectifiers

11. Simulation of Speed control of Dc motors using DC choppers

**TOTAL: 60 PERIODS**

## COURSE OUTCOMES

Upon successful completion of the course, students will be able to:

**CO1** Infer the characteristics of BJT.

**CO2** Compute performance characteristics of DC and AC Machines with various loads.

**CO3** Analyze the speed characteristic of DC and AC Machines.

**CO4** Analyze the characteristics of DC motor using Simulation software.

**CO5** Simulate the Speed control of DC motors using controlled rectifiers and DC choppers

**CO-PO MAPPING**

|       | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| CO1   | 3   | 3   | 3   | 2   |     |     |     |     |     |      |      |      |
| CO2   | 3   | 2   | 2   | 1   | 3   |     |     |     |     |      |      |      |
| CO3   | 3   | 3   | 3   | 2   | 3   |     |     |     |     |      |      |      |
| CO4   | 3   | 2   | 2   | 1   | 3   |     |     |     |     |      |      |      |
| CO5   | 3   | 3   | 3   | 2   | 3   |     |     |     |     |      |      |      |
| CO6   | 3   | 2   | 2   | 1   | 3   |     |     |     |     |      |      |      |

| Internal Assessment | | End Semester Examination |
|---|---|---|
| Evaluation of Laboratory Observation, Record | Test | Practical |
| 75 | 25 | 100 |
| 60 % | | 40% |

| 23TA1201 | TAMILS AND TECHNOLOGY | L | T | P | C |
|----------|----------------------|---|---|---|---|
|          |                      | 1 | 0 | 0 | 1 |

### UNIT–I      WEAVINGAND CERAMIC TECHNOLOGY      3

Weaving Industry during Sangam Age–Ceramic technology–Black and Red Ware Potteries (BRW) –Graffition Potteries.

### UNIT–II      DESIGNANDCONSTRUCTION TECHNOLOGY      3

Designing and Structural construction House & Designs in household materials during Sangam Age –Building materials and Hero stones of Sangam age— Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)-Thirumalai Nayakar Mahal -Chetti Nadu Houses, Indo –Saracenic architecture at Madras during British Period.

### UNIT–III      MANUFACTURING TECHNOLOGY      3

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting, steel - Copper and gold-Coins as source of history - Minting of Coins — Beads making-industries Stone beads -Glass beads -Terracotta beads -Shell beads/ bone beats - Archeological evidences - Gem stone types described in Silappathikaram.

### UNIT–IV      AGRICULTUREAND IRRIGATION TECHNOLOGY      3

Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry -Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries —Pearl-Conchediving-AncientKnowledgeofOcean-KnowledgeSpecificSociety.

### UNIT–V      SCIENTIFICTAMIL & TAMIL COMPUTING      3

DevelopmentofScientificTamil-Tamilcomputing–DigitalizationofTamilBooks–DevelopmentofTamil Software — Tamil Virtual Academy — Tamil Digital Library — Online Tamil Dictionaries —Sorkuvai Project.

**Total : 15 PERIODS**

| | | L | T | P | C |
|---|---|---|---|---|---|
| 23TA1201 | தமிழரும் தொழில்நுட்பமும் | 1 | 0 | 0 | 1 |

**UNIT–I**　　　　**நெசவு மற்றும் பானைத் தொழில்நுட்பம்**　　　　**3**

சங்க காலத்தில் நெசவுத் தொழில் – பானைத் தொழில்நுட்பம் – கருப்பு சிவப்பு பாண்டங்கள் – பாண்டங்களில் கீறல் குறியீடுகள்.

**UNIT–II**　　　**வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்**　　　**3**

சங்ககாலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்ககாலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு – சங்ககாலத்தில் கட்டுமானப் பொருட்களும் நடுகல்லும் – சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் - மாமல்லபுரச்சிற்பங்களும், கோவில்களும் – சோழர்காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத்தலங்கள் – நாயக்கர் காலக்கோயில்கள் – மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சிஅம்மன் ஆலயம் மற்றும் திருமலைநாயக்கர் மஹால் – செட்டிநாடு வீடுகள் – பிரிட்டிஷ்காலத்தில் சென்னையில் இந்தோ-சாரோசோனிக் கட்டிடக்கலை.

**UNIT–III**　　　　　**உற்பத்தி தொழில்நுட்பம்**　　　　　**3**

கப்பல் கட்டும் கலை - உலோகவியல் – இரும்புத் தொழிற்சாலை – இரும்பை உருக்குதல், எஃகு – வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்கநாணயங்கள் – நாணயங்கள் அச்சடித்தல் – மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - சுடுமண்மணிகள் - சங்குமணிகள் – எலும்புத் துண்டுகள் – தொல்லியல் சான்றுகள் – சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

| UNIT–IV | வேளாண்மை மற்றும் நீர்பாசனத் தொழில்நுட்பம் | 3 |

அணை, ஏரி, குளங்கள், மதகு – சோழர்காலக் குமிழித் தூம்பின் முக்கியத்துவம் – கால்நடை பராமரிப்பு – கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் – வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் – கடல்சார் அறிவு - மீன்வளம் – முத்து மற்றும் முத்துக்குளித்தல் – பெருங்கடல் குறித்த பண்டைய அறிவு – அறிவுசார் சமூகம்.
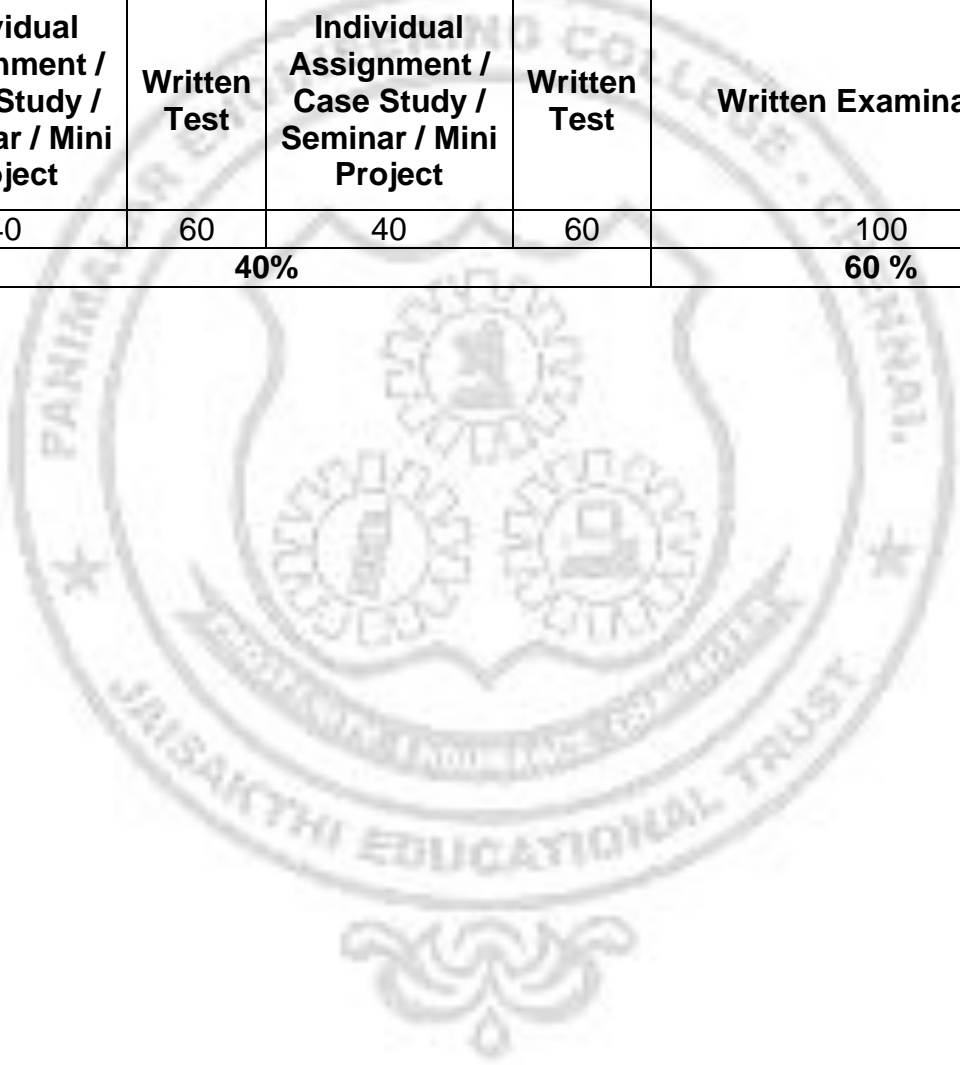
| UNIT–V | அறிவியல் தமிழ் மற்றும் கணினித்தமிழ் | 3 |

அறிவியல் தமிழின் வளர்ச்சி - கணினித்தமிழ் – தமிழ்நூல்களை மின்பதிப்புசெய்தல் – தமிழ் மென்பொருட்கள் உருவாக்கம் – தமிழ் இணையக்கல்விக்கழகம் – தமிழ் மின்னூலகம் – இணையத்தில் தமிழ் அகராதிகள் – சொற்குவைத் திட்டம்.

**Total : 15 PERIODS**

**TEXT-CUM REFERENCE BOOKS:**

1. தமிழக வரலாறு – மக்களும் பண்பாடும் - கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித்தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகரநாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை)
5. Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D.Thirunavukkarasu) (Published Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL–(in print)
6. Social Life of the Tamils-The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies   Historical by: International Institute of Tamil Studies).
7. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
8. Keeladi- 'Sangam City Civilization on the banks of river Vaigai '(Jointly Published by: Department of Archaeology & TamilNadu Text Book and Educational Services Corporation, Tamil Nadu)

9. Studies in the History of India with Special Reference to TamilNadu (Dr.K.K.Pillay ) (Published by: The Author)
10. Porunai Civilization (Jointly Published by: Department of Archaeology & TamilNadu Text Book and Educational Services Corporation, Tamil Nadu)
11. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL)

| Internal Assessment | | | | End Semester Examinations |
|---|---|---|---|---|
| Assessment I (100 Marks) | | Assessment II (100 Marks) | | |
| Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Individual Assignment / Case Study / Seminar / Mini Project | Written Test | Written Examinations |
| 40 | 60 | 40 | 60 | 100 |
| **40%** | | | | **60 %** |

57

| 23HS1204 | **INTERPERSONAL COMMUNICATION SKILLS II** | L | T | P | C |
|----------|--------------------------------------------|---|---|---|---|
|          |                                            | 0 | 0 | 2 | 0 |

## COURSE OBJECTIVES

- To induce the basic reading and writing skills of the freshers.
- To enhance the active listening skills of the learners through practice to develop their
- listening skills, which will enable them listening to lectures and comprehend them by asking questions and seeking clarifications
- To secure the learners to develop their speaking skills and speak fluently in real contexts.
- To motivate the learners to develop vocabulary of a general kind by developing their reading
- skills for meeting the competitive exams like GATE, TOFEL, GRE, IELTS, and other exams conducted by Central and State governments
- To improve communication skills of the learners in a professional setting.

### INTERPERSONAL SKILLS

**Listening**: Listening to Telephonic Conversation- on various jobs , recruitments and processes and professional etiquette

**Speaking**: Answering Telephonic Calls Attending telephonic interviews Presenting Work Activities, Presentation on Business Ideas and Iconic Personalities

**Reading**:   Inferring information from business/professional letters Newspaper activities (Skimming / scanning) acquiring knowledge related to leading successful personalities and business consultancies.

**Writing**: Art of Letter Writing – Business Letters and Emails – acknowledging the performances and promoting the base and superstructures.

**TOTAL : 30  PERIODS**

## TEXT BOOKS:

1. Crucial Conversations: Tools for Talking When Stakes Are High by Kerry Patterson, Joseph Grenny, Ron McMillan, and Al Switzler, 2014
2. Simply Said: Communicating Better at Work and Beyond by Jay Sullivan, 2016

## REFERENCE BOOKS:

1. Words That Work: It's Not What You Say, It's What People Hear by Dr. Frank Luntz,2011.
2. Fine Art of Small Talk: How To Start a Conversation, Keep It Going, Build Networking Skills — and Leave a Positive Impression! By Debra Fine

**WEB REFERENCES:**

1. https://www.helpguide.org/articles/relationships-communication/effective-communication.htm

**ONLINE COURSES / RESOURCES:**

1. https://www.amazon.com/Words-That-Work-What-People/dp/1401309291/

2. https://www.amazon.com/Fine-Art-Small-Talk-Conversation/dp/1401302262

**COURSE OUTCOME:**

Upon completion of the course, students will be able to:

| | |
|---|---|
| **CO1** | Comprehend conversation and short talks delivered in English. |
| **CO2** | Participate effectively in informal conversation; introduce themselves and their friends and express opinions English. |
| **CO3** | Read articles of a general kind in magazines and newspaper |
| **CO4** | Write short essays of a general kind and personal letters and emails in English. |
| **CO5** | Gain understanding of basic grammatical structures and use them in right context. |
| **CO6** | Use appropriate words in a professional context. |

**CO&PO MAPPING**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | | | | | | | | | 3 | 3 | | 2 |
| **CO2** | | | | | | | | | 3 | 3 | | 2 |
| **CO3** | | | | | | | | | 2 | 3 | | 2 |
| **CO4** | | | | | | | | | 2 | 3 | | 2 |
| **CO5** | | | | | | | | | 2 | 3 | | 2 |
| **CO6** | | | | | | | | | 3 | 3 | | 2 |

| 23HS1205 | QUANTITATIVE APTITUDE PRACTICES II | L | T | P | C |
|----------|-----------------------------------|---|---|---|---|
|          |                                   | 0 | 0 | 1 | 0 |

## COURSE OBJECTIVE:

- To improve students comprehension of geometry and mensuration, average as well as help them hone their problem-solving abilities

- To develop students ability to use the techniques for resolving riddles, streams, boats, and coding problems.

**Module 1    Geometry and Mensuration**    **3**

Lines and angles – circles – triangles – quadrilaterals – polygons - coordinate geometry area &volume of 2D and 3D figures.

**Module 2    Average, Time, Work**    **3**

Logarithm - Average - time and  work - time and distance

**Module 3    Boats and streams**    **3**

Relative speed – problems on trains – boats and streams – races and games

**Module 4    Logical Reasoning - I**    **3**

Odd man out and series – venn diagram - seating arrangement – decision making

**TOTAL : 12 PERIODS**

## COURSE OUTCOME:

Upon completion of the course, students will be able to:

**CO1**    Acquire knowledge of solving geometry and mensuration, average, percentage, time and work questions effortlessly.

**CO2**    Understand and exhibit sound knowledge to the boats and streams, venn diagram and decision making.

## TEXT BOOKS:

1. Aggarwal R.S,Quantitative Aptitude for Competitive Examinations 3rd edition New Delhi: S. Chand Publishing, .2017.
2. Abhijitguha Quantitative Aptitude for All Competitive Examinations, 6th edition. Noida: McGraw Hill Education Pvt. Ltd., 2016.
3. FACE, Aptipedia Aptitude Encyclopedia1(Ed.).New Delhi: Wiley Publications,2016.

**REFERENCE BOOK:**

1. Sharma arun,.Quantitative aptitude,7th(Ed.).Noida : McGraw Hill Education Pvt.Ltd. 2016.
2. Praveen. R.V 3$^{rd}$ edition, Quantitative aptitude and reasoning, PHI learning publication,2016.

**WEB REFERENCES:**

https:// www.indiabix.com

**Mode of Evaluation: Online Test**