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 - ELECTRICAL AND ELECTRONICS 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 Electrical and Electronics Engineering
B.E- Electrical and Electronics Engineering

CURRICULUM AND SYLLABUS

REGULATION-2023

(For the Students admitted during 2024-25)

VISION AND MISSION OF THE DEPARTMENT

VISION

To provide excellence in technical education of electrical and electronics engineering and produce globally competent engineers for the revolution of industry

MISSION

1. To Provide good infrastructure and serene environment to our students and faculty members to meet the requirement of electrical and electronics engineering.
2. To prepare the students through contextual technical education for their career enrichment.
3. To impart knowledge on core engineering fields through projects, workshops and industry interaction.
4. To prepare graduates with ethical, social and environmental awareness to demonstrate professionalism in multidisciplinary environment.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

1. To prepare students to analyze, design and implement basic electrical circuits and power systems using the knowledge of basic science and mathematics.
2. To train students with scientific and engineering knowledge so as to comprehend, analyze, design and create novel products and solutions for real time problems.
3. To prepare students with robust knowledge in core engineering for the betterment of placement, research and higher studies.
4. To inculcate graduates with communication skills, leadership qualities in their profession and adopt to current trends by engaging in lifelong learning.
5. To prepare graduates to demonstrate professionalism with social and ethical values

PROGRAM OUTCOMES (PO)

1. **Engineering knowledge:**

   Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialisation to the solution of complex engineering problems.

2. **Problem Analysis:**

   Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **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.

4. **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.

5. **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.

6. **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.

7. **Environment and Sustainability**

   Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of need for sustainable development.

8. **Ethics**

   Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and Team Work**

   Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**

    Communicate effectively on complex engineering activities with the engineering community and with society at large. Some of them are, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **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.

12. **Lifelong learning**

    Recognise the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO 1. Apply the basic knowledge of mathematics, science, electrical and electronics engineering to analyze and solve the complex problems in Electrical Machines, Control Systems, Instrumentation, Power Systems and Power Electronic Systems.

PSO 2. Design and develop hardware and software requirements to meet the needs of Electric drives, Automation, Power Systems and Embedded systems based industries.

PSO 3. To take up roles in a team, develop managerial skills, and contributes towards the electrical community globally.

B.E.-Electrical and Electronics Engineering

CHOICE BASED CREDIT SYSTEM (CBCS)

I - VIII SEMESTERS CURRICULUM AND SYLLABI (REGULATION 2023)

(For the Students admitted during 2024-25)

Semester I							
S. No	**COURSE CODE**	**COURSE TITLE**	**Category**	**L/T/P**	**Contact Hours**	**Credit**	**Ext / Int Weightage**
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 PracticesI	EEC	0/0/1	1	0	0/100
			TOTAL		**27**	**19**	

Semester II							
S. No	**COURSE CODE**	**COURSE TITLE**	**Category**	**L/T/P**	**Contact Hours**	**Credit**	**Ext / Int Weightage**
Theory Courses							
1.	23MA1201	Complex Variables and Laplace Transform	BS	3/1/0	4	4	60/40
2.	23ES1206	Programming in Python	ES	3/0/0	3	3	60/40
3.	23ES1202	Basic Civil and Mechanical 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.	23EE1201	Electric Circuit Analysis	PCC	3/0/2	5	4	50/50
Laboratory Courses							
6.	23EE1211	Engineering Practices Laboratory	PC	0/0/4	4	2	40/60
7.	23ES1215	Programming in Python Laboratory	ES	0/0/4	4	2	40/60
8.	23ES1212	Technical Skill Practices I	EEC	0/0/2	2	1	40/60
Mandatory Course							
9.	23TA1201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	HS	1/0/0	1	1	60/40
10.		Mandatory Course 1	MC	2/0/0	2	0	0/100
11.	23HS1204	Interpersonal Communication skillsII	EEC	0/0/2	2	0	0/100
12.	23HS1205	Quantitative Aptitude Practices II	EEC	0/0/1	1	0	0/100
			TOTAL		**35**	**23**	

SEMESTER – I

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, 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,9thEdition,NewDelhi,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. SivaramakrishnaDass, 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 – Go to 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.

UNIT - V	FILE PROCESSING	9

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	Learn the syntax for C programming
CO2	Develop simple applications in C using basic constructs
CO3	Design and implement applications using arrays and strings
CO4	Develop and implement applications in C using functions and pointers.
CO5	Develop applications in C using structures and union.
CO6	Design applications using sequential and random access file processing

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

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 –POMAPPING

	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 %

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 LINES	9

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	9

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	9

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	9

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**	**7**

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 : 45 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

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O 1	PS O 2	PS O 3
CO1	3	3	3	2	1	-	-	-	-	-	-	1	3	1	1
CO2	3	3	3	2	1	-	-	-	-	-	-	1	3	1	1
CO3	3	3	3	2	1	-	-	-	-	-	-	1	3	1	1
CO4	3	3	3	2	1	-	-	-	-	-	-	1	3	1	1
CO5	3	3	3	2	1	-	-	-	-	-	-	1	3	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 aPrint Interviewand Answering ComprehensionQuestions. 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: CUP, 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. CambridgeUniversity Press, Cambridge: Reprint 2011 3. Means,L. Thomas and Elaine Langlois. English & Communication For Colleges. Cengage Learning ,USA:2007
4. 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:

1. SureshKumar.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

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<tr><td colspan="2">Assessment
(40% weightage)
(Theory Component)</td><td colspan="2">Assessment
(60% weightage)
(Laboratory Component)</td><td>End Semester Examination</td></tr>
<tr><td>Individual Assignment / Case Study / Seminar / Mini Project</td><td>Written Test</td><td>Evaluation of Laboratory Observation, Record</td><td>Test</td><td>Written Examination</td></tr>
<tr><td>40</td><td>60</td><td>75</td><td>25</td><td rowspan="3"></td></tr>
<tr><td colspan="4">100</td><td>100</td></tr>
<tr><td colspan="4">50 %</td><td>50 %</td></tr>
</table>

23PH1103	ENGINEERING PHYSICS	L	T	P	C

		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 %

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

COURSE OBJECTIVE

To impart Knowledge on the following topics:

- Write, test, and debug simple C programs
- Implement C programs with conditional and looping statement
- Develop applications in C using strings, pointers, functions
- Implement C programs with structures and union
- Develop applications in C using file processing
- Develop an application in real time situation

LIST OF EXPERIMENTS

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 average height.
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%

23TA1101	HERITAGE OF TAMIL	L	T	P	C
		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
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 %**

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

UNIT – I	மொழி மற்றும் இலக்கியம்	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 வரை - சிற்பக் கலை	3

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 விளையாட்டுகள்	3

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

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 பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு**	**3**
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 %**

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

CONTENTS

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://teambuilding.com/blog/communication-books
2. 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
2. https://blog.hubspot.com/service/phone-etiquette

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**	**3**

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

Module 2	**Algebra**	**3**

Algebra - decimal fraction - arithmetic progression - geometric progression.

Module 3	**Blood relations**	**3**

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

Module 4	**Data Interpretation**	**3**

Table chart- pie chart - bar chart - line charts

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 NewDelhi: S.Chand Publishing.
2. Abhijit guha(2016). Quantitative Aptitude for All Competitive Examinations, 6th edition. Noida :McGraw Hill 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

SEMESTER – II

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 and Stokes' theorem (excluding proofs) – Simple applications involving cubes, rectangular parallelepiped**.**

UNIT III	ANALYTIC FUNCTIONS	9+3

Functions of a complex variable–Analytic functions -Cauchy-Riemann equations – Necessaryandsufficientconditions–Harmonicandorthogonalpropertiesofanalytic 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 INTEGRATION	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 conditions 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 – Transforms of periodic functions– Initial and final value theorems. Inverse Laplace transforms: Convolution theorem–Solution of linear ODE of second order with constant coefficients using the 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. Grewal B.S.,- "Higher Engineering Mathematics", Khanna Publishers, NewDelhi, 44th Edition, 2018.
2. B.V. Ramana, "Higher Engineering Mathematics", McGraw Hill Education, India.
3. Bali N., Goyal M. and Walkins C., "Advanced Engineering Mathematics", Firewall.

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 %

23ES1206	PROGRAMMING IN PYTHON	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

- To know the basic programming constructs and control structures in python
- To use python data structures – Lists, Tuples and Dictionary
- To define Python functions and use Strings
- To learn about input/output with files in Python.
- To understand python packages and GUI concepts

UNIT - I	INTRODUCTION TO PYTHON PROGRAMMING AND CONTROL STRUCTURES	9

Introduction to Python, Demo of Interactive and script mode, Tokens in Python – Variables, Keywords, Comments, Literals, Data types, Indentation, Operators and its precedence, Expressions, Input and Print functions, Type Casting. Illustrative problems: find minimum in a list, guess an integer number in a range, Towers of Hanoi.

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. Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT - II	FUNCTIONS AND STRINGS	9

Functions: Types, parameters, arguments: positional arguments, keyword arguments, parameters with default values, functions with arbitrary arguments, Scope of variables: Local and global scope, Recursion and Lambda functions. Illustrative programs: power of a number, sorting, Fibonacci series using lambda.

Strings: Formatting, Comparison, Slicing, Splitting, Stripping, Negative indices, String functions, Regular expression: Matching the patterns, Search and replace. Illustrative programs:check whether the string is symmetrical, reverse a string, length of a string.

UNIT - III	COLLECTIONS	9

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.

Illustrative programs: Interchange first and last element in a list, maximum and minimum N elements in a tuple, sort dictionary by key or value, size of a set.

UNIT -IV	**FILES AND EXCEPTION HANDLING**	**9**

Files: Open, Read, Write, Append and Close. Tell and seek methods. Illustrative programs: word count, copy file.

Command line arguments, Errors and Exceptions: Syntax Errors, Exceptions, Handling Exceptions, Raising Exceptions, Exception Chaining, User-defined Exceptions, Defining Clean-Up actions.

Illustrative programs: prompt the user to input an integer and raises a Value Error exception if the input is not a valid integer, open a file and handles a File Not Found Error exception if the file does not exist, prompt the user to input two numbers and raises a Type Error exception if the inputs are not numerical, executes an operation on a list and handles an Index Error exception if the index is out of range.

UNIT -V	**PACKAGES & GUI**	**9**

Python packages: Simple programs using the built-in functions of packages matplotlib, numpy, pandas etc. Illustrative programs: create a pandas series using numpy, make a pandas data frame with 2D list.

GUI Programming: Tkinter introduction, Tkinter and Python Programming, Tk Widgets, Tkinter examples. Python programming with IDE. Illustrative programs: create a GUI marksheet, calendar, file explorer using Tkinter,

TOTAL: 45 PERIODS

COURSE OUTCOME(S):

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

CO1	Illustrate conditionals and loops for solving problems using Python programs.
CO2	Express proficiency in the handling of strings and functions
CO3	Apply Python lists, tuples, dictionaries, sets etc to Represent compound data
CO4	Compare and contrast reading and writing data from/to files and handle exceptions in Python programs.
CO5	Experiment with python packages in data analysis and design GUI
CO6	Build real time applications using problem solving concepts in python.

TEXT BOOKS:

1.	Paul Deitel and Harvey Deitel, “Python for Programmers”, Pearson Education, 1st Edition, 2021.
2.	ReemaThareja,”Problem Solving and Programming with Python’’, 2nd edition, Oxford University Press, New Delhi, 2019.
3.	Alan D. Moore, Python GUI Programming with Tkinter, Design and Build Functional and User-friendly GUI Applications, Packt Publishing, 2021.

REFERENCE BOOKS:

1.	Martin C. Brown, “Python: The Complete Reference”, 4th Edition, Mc-Graw Hill, 2018
2.	Eric Matthes, “Python Crash Course, A Hands - on Project Based Introduction to Programming”, 2nd Edition, No Starch Press, 2019.
3.	Allen B. Downey, “Think Python: How to Think like a Computer Scientist”, 2nd Edition, O’Reilly Publishers, 2016.
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/

CO-PO MAPPING

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

23ES1202	BASIC CIVIL AND MECHANICAL ENGINEERING	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

- To provide basic knowledge about civil and mechanical concepts
- To understand the surveying method and usage of building materials,
- To understand the basic of Internal combustion engine and power plant.
- To understand the basic of refrigeration and air conditioning system.

UNIT - I	SCOPE OF MECHANICAL AND CIVIL ENGINEERING	9

Overview of Civil Engineering – Civil Engineering contributions to the welfare of Society – Specialized sub disciplines in Civil Engineering – Structural, Construction, Geotechnical, Environmental, Transportation and Water Resources Engineering

Overview of Mechanical Engineering – Mechanical Engineering contributions to the welfare of Society –Specialized sub disciplines in Mechanical Engineering – Production, Automobile, and Energy Engineering – Interdisciplinary concepts in Civil and Mechanical Engineering.

UNIT - II	SURVEYING AND CIVIL ENGINEERING MATERIALS	9

Surveying: Objects – classification – principles – measurements of distances – angles – leveling –determination of areas– contours – examples.

Civil Engineering Materials: Bricks – stones – sand – cement – concrete – steel – timber – modern materials.

UNIT - III	BUILDING COMPONENTS AND STRUCTURES	9

Foundations: Types of foundations – Bearing capacity and settlement – Requirement of good foundations.
Civil Engineering Structures: Brick masonry – stonemasonry – beams – columns – lintels – roofing– flooring – plastering – floor area, carpet area and floor space index.

Types of Bridges and Dams – water supply – sources and quality of water – Rain water harvesting – introduction to high way and rail way.

UNIT - IV	INTERNAL COMBUSTION ENGINES AND POWER PLANTS	9

Classification of Power Plants- Working principle of steam, Gas, Diesel, Hydro -electric and Nuclear Power plants

Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines - Introduction to Electric Vehicles and Hybrid Vehicles Working principle of Boilers-Turbines, Reciprocating Pumps (single acting and double acting) and Centrifugal Pumps, Concept of hybrid engines. Industrial safety practices and protective Devices

UNIT - V	REFRIGERATION AND AIR CONDITIONING SYSTEM	9

Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system–Layout of typical domestic refrigerator–Window and Split type room Air conditioner. Properties of air - water mixture, concepts of psychometric and its process.

TOTAL : 45 PERIODS

COURSE OUTCOME(S):

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

CO1	Understanding overview of Mechanical and Civil Engineering.
CO2	Understanding surveying and materials of constructions.
CO3	Ability to select the suitable construction materials and use in building construction.
CO4	Analyse various components of Internal Combustion Engine and Power plant.
CO5	Ability to use refrigeration and air-conditioning system as per requirement.

TEXT BOOKS:

3. Shanmugam Gand Palanichamy MS, "Basic Civil and Mechanical Engineering",Tata McGraw Hill PublishingCo.,NewDelhi,2018.
4. Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2021.

REFERENCE BOOKS:

6. Venugopal K. and Prahu Raja V., "Basic Mechanical Engineering", Anuradha Publishers, Kumbakonam,2016
7. Seetharaman S.,"BasicCivil Engineering",AnuradhaAgencies,2005.
8. Shantha Kumar SRJ.,"Basic Mechanical Engineering", Hi-tech Publications, Mayiladuthurai, 2020.

WEB REFERENCES:

1. cengagehttps://www.cengage.co.in
2. Archives of Civil and Mechanical Engineering | Home - Springerhttps://www.springer.com
3. Basic Civil and Mechanical Engineering - https://www.brainkart.com.

ONLINE COURSES / RESOURCES:

1. Top Free Online Courses Websites For Engineering Courses https://www.constructionplacements.com
2. Mechanical Engineering Courses Online | Courserahttps://www.coursera.org

CO-PO MAPPING

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

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.
- To improve the relevant language skills necessary for professional communication
- 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.
- To prepare them for various public and private sector exams & placement drives.

UNIT I	INTERPERSONAL COMMUNICATION	6

Listening: Listening to Telephone Etiquettes and Conversations. **Speaking**: Role Play Exercises Based on Workplace Contexts, Introducing Oneself - PEP Talks. **Reading**: Reading the Interview of an Achiever and Completing Exercises (Skimming, Scanning and Predicting). **Writing**: Writing a Short 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. (2017). Quantitative Aptitude for Competitive Examinations 3rd (Ed.) New Delhi: S.Chand Publishing	
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-vocabularyexams/wordformation

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

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 (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 %**

23EE1201	ELECTRIC CIRCUIT ANALYSIS	L	T	P	C
		3	0	2	4

COURSE OBJECTIVE:

- To introduce electric circuits and its analysis
- To impart knowledge on solving circuit equations using network theorems
- To introduce the phenomenon of resonance in coupled circuits
- To educate on obtaining the transient response of circuits
- To introduce Phasor diagrams and analysis of three phase circuits.

UNIT I	BASIC CIRCUITS ANALYSIS	9

Resistive elements - Ohms Law Resistors in series and parallel circuits — Kirchoff‟s laws – --Mesh current and node voltage - methods of analysis

UNIT II	NETWORK REDUCTION AND THEOREMS FOR DC AND AC CIRCUITS	9

Network reduction: voltage and current division, source transformation – star delta Conversion- Thevenin‟s and Norton‟s Theorems – Superposition Theorem – Maximum power transfer theorem – Reciprocity Theorem.

UNIT III	TRANSIENT RESPONSE ANALYSIS	9

L and C elements -Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C. sinusoidal input.

UNIT IV	THREE PHASE CIRCUITS	9

A.C. circuits — Average and RMS value - Phasor Diagram — Power, Power Factor and Energy- Analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced & unbalanced — phasor diagram of voltages and currents — power measurement in three phase circuits.

UNIT V	RESONANCE AND COUPLED CIRCUITS	9

Series and parallel resonance – their frequency response – Quality factor and Bandwidth - Self and mutual inductance – Coefficient of coupling – Tuned circuits – Single tuned circuits.

TOTAL :45 PERIODS

COURSE OUTCOME

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

CO1	Explain circuit‟s behavior using circuit laws.
CO2	Apply mesh analysis/ nodal analysis / network theorems to determine behavior of the given DC and AC circuit.
CO3	Compute the transient response of first order and second order systems to step and sinusoidal input.

CO4	Compute power, line/ phase voltage and currents of the given three phase circuit.
CO5	Explain the frequency response of series and parallel RLC.
CO6	Explain the behaviour of magnetically coupled circuits.

TEXT BOOKS:

1. William H. HaytJr, Jack E. Kemmerly and Steven M. Durbin, “Engineering Circuits Analysis”,McGraw Hill publishers, edition, New Delhi, 2013.
2. Charles K. Alexander, Mathew N.O. Sadiku, “Fundamentals of Electric Circuits”, SecondEdition, McGraw Hill, 2013. 36
3. Allan H. Robbins, Wilhelm C. Miller, “Circuit Analysis Theory and Practice”, Cengage LearningIndia, 2013
4. Sudhakar A and Shyam Mohan SP, “Circuits and Network Analysis and Synthesis”, McGrawHill, 2015

REFERENCE BOOKS:

1. Chakrabarti A, “Circuits Theory (Analysis and synthesis), DhanpathRai& Sons, New Delhi,1999.
2. Jegatheesan, R., “Analysis of Electric Circuits,” McGraw Hill, 2015.
3. Joseph A. Edminister, MahmoodNahri, “Electric circuits”, Schaum‟s series, McGrawHill, NewDelhi, 2010.
4. M E Van Valkenburg, “Network Analysis”,Prentice-Hall of India Pvt Ltd, New Delhi, 2015.
5. Mahadevan, K., Chitra, C., “Electric Circuits Analysis,” Prentice-Hall of India Pvt Ltd., New Delhi,2015.
6. Richard C. Dorf and James A. Svoboda, “Introduction to Electric Circuits”, 7th Edition, JohnWiley & Sons, Inc. 2015

WEB REFERENCES:

1. https://www.circuitlab.com/
2. https://www.allaboutcircuits.com/

ONLINE COURSES / RESOURCES:

1. https://nptel.ac.in/courses/108/104/108104139/
2. https://nptel.ac.in/content/storage2/courses/108105053/pdf/L17(NKD)(ET)%20((EE)NPTEL).pdf.

LANGUAGE SKILLS LAB	**30 Hours**

LIST OF EXPERIMENTS

1. Experimental verification of Kirchhoff"s current and voltage law
2. Simulation and Experimental verification of Theremin's , Norton's and Maximum PowerTransfer theorem
3. Simulation and Experimental verification of Superposition theorem
4. Experimental determination of time constant of series RL, RC circuits
5. Experimental determination of frequency response of RLC circuits
6. Design and Simulation of series and parallel resonant circuits
7. Simulation of three phases balanced and unbalanced star & delta connected networks

SOFTWARE REQUIRED: MATLAB

CO-PO MAPPING

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

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 %**

23EE1211	**ENGINEERING PRACTICES LABOATORY**	**L**	**T**	**P**	**C**
		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

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

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

Sheet Metal Work:

1) Demonstrating basic sheet metal operations

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.

GROUP – B MECHANICAL AND ELECTRONICS

ELECTRONICS ENGINEERING PRACTICES 15

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”, Vikas Puplishing 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/

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
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%**

23ES1215	**PROGRAMMING IN PYTHON LABORATORY**	**L**	**T**	**P**	**C**
		0	**0**	**4**	**2**

COURSE OBJECTIVE:

•	To write, test, and debug simple Python programs
•	To implement Python programs with conditions and loops
•	To use functions for structuring Python programs.
•	To represent compound data using Python lists, tuples, dictionaries.
•	To learn to implement string functions and file operations
•	To understand python packages and GUI development.

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 python scripts 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.	Develop python codes to perform matrix addition, subtraction and transpose of the given matrix
11.	Develop python codes to demonstrate the concept of function composition and anonymous functions.
12.	Demonstrate python codes to print try, except and finally block statements
13.	Implement python programs to perform file operations
14.	Write a python code to raise and handle various built in exceptions.
15.	Implement python programs using packages numpy and pandas
16.	UI development using tkinter
Mini Project :Suggested Topics(but not limited to)	
1.	Dice roll simulator
2.	Guess the number game
3.	Random password generator
	TOTAL: 60 PERIODS

COURSE OUTCOME(S):

Upon successful completion of the course student will be able to:

CO1	Develop and execute simple Python programs
CO2	Implement programs in Python using conditionals and loops for solving problems.
CO3	Develop functions to decompose a Python program.
CO4	Compare various string operations in Python.
CO5	Experiment with Python packages in data analysis
CO6	Create GUI for python applications

WEB REFERENCES:	
1.	https://www.programiz.com/python-programming/examples
2.	https://www.geeksforgeeks.org/python-programming-examples/
3.	https://beginnersbook.com/2018/02/python-programs/
4.	https://www.javatpoint.com/python-programs
5.	https://www.w3schools.com/python/python_examples.asp

CO- PO MAPPING

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

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

23ES1212	**TECHNICAL SKILL PRACTICES I**	**L**	**T**	**P**	**C**
		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/

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

UNIT – I	WEAVING AND CERAMIC TECHNOLOGY	3

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

UNIT – II	DESIGN AND CONSTRUCTION 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	AGRICULTURE AND 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 - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society.

UNIT –V	SCIENTIFIC TAMIL & TAMIL COMPUTING	3

Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Development of Tamil Software — Tamil Virtual Academy — Tamil Digital Library — Online Tamil Dictionaries — Sorkuvai Project.

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 C ivilization 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 %**

23TA1201	தமிழரும் தொழில்நுட்பமும்	L	T	P	C
		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

சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு - சங்க காலத்தில் கட்டுமானப் பொருட்களும் நடுகல்லும் - சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் - மாமல்லபுரச் சிற்பங்களும், கோவில்களும் - சோழர் காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் - நாயக்கர் காலக் கோயில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - செட்டிநாடு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ-சாரோசோனிக் கட்டிடக் கலை.

UNIT – III	உற்பத்தி தொழில்நுட்பம்	3

கப்பல் கட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருக்குதல், எஃகு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் - மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள் - 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 - தமிழ் நூல்களை மின்பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக் கழகம் - தமிழ் மின் நூலகம் - 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.	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 C ivilization 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 %**

23MC1001	**ENVIRONMENTAL SCIENCE**	**L**	**T**	**P**	**C**

		2	**0**	**0**	**0**

COURSE OBJECTIVE:

- To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.
- To impart knowledge on the causes, effects and control or prevention measures of environmental pollution.
- To familiarize the influence of societal use of resources on the environment and introduce the legal provisions, National and International laws and conventions for environmental protection

UNIT - I	**ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY**	**6**

Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers– energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids Introduction to biodiversity definition: genetic, species and ecosystem diversity – bio geographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In situ and ex-situ conservation of biodiversity.

UNIT - II	**ENVIRONMENTAL POLLUTION**	**6**

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards– solid waste management: causes, effects and control measures of municipal solid wastes, biomedical wastes and e-wastes – role of an individual in prevention of pollution – pollution case studies.

UNIT - III	**NATURAL RESOURCES**	**6**

Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over- utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Land resources: Land as a source, land degradation, man induced landslides, soil erosion and desertification–role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.

UNIT - IV	**SOCIAL ISSUES AND THE ENVIRONMENT**	**6**

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion. environment protection act – Air (Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act – Wildlife protection act – Forest conservation act – enforcement machinery involved in environmental legislation- central and state pollution control boards Public awareness.

UNIT - V	HUMAN POPULATION AND THE ENVIRONMENT	6

Population growth, variation among nations – population explosion – family welfare Programme– environment and human health – human rights – value education – HIV / AIDS - women and child welfare – role of information technology in environment and human health - case studies.

TOTAL : 30 PERIODS

COURSE OUTCOME(S):

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

CO1	To recognize and understand the functions of environment, ecosystems, biodiversity and their conservation.
CO2	To identify the causes, effects and control measures of environmental pollution and to implement the preventive measures.
CO3	To identify the various types of natural resources, their exploitation, consequences and to apply methodologies for its conservation.
CO4	To describe and analyse the concept of sustainable development, the fundamental key concepts of various social issues and environmental Acts.
CO5	To outline the reasons for human population and the role of information technology in environment and human health.

TEXT BOOKS:

1. Anubha Kaushik and C. P. Kaushik's "Perspectives in Environmental Studies", 6 th Edition, New Age International Publishers (2018).
2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi,(2016)
3. Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education (2004)..

REFERENCE BOOKS:

1. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media.

2. Cunningham, W.P. Cooper, T.H. Gorhani, 'Environmental Encyclopedia', Jaico Publ., House, Mumbai, 2001.

3. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT. LTD, New Delhi, 2007.

4. Erach Bharucha "Textbook of Environmental Studies for Undergraduate Courses" Orient BlackswanPvt. Ltd. (2013).

WEB REFERENCES:

1. **https://www.nationalgrid.com/stories/energy-explained**
2. **https://www.conservationindia.org/articles/human-elephant-conflict**
3. **https://www.sciencedirect.com/topics/earth-and-planetary-sciences/pollutant-monitoring**

4. https://www.undp.org/sustainable-development-goals
ONLINE COURSES / RESOURCES:
1.https://nptel.ac.in/courses/105107213 2.https://nptel.ac.in/courses/105107181 3.https://nptel.ac.in/courses/103106162 4.https://nptel.ac.in/courses/103107212

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 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 communication skills of the learners in a professional setting

CONTENTS

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. 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://teambuilding.com/blog/communication-books
2. https://www.helpguide.org/articles/relationships-communication/effective-communication.htm

ONLINE COURSES / RESOURCES:

1. https://in.indeed.com/career-advice/career-development/letter-of-recommendation
2. https://in.indeed.com/career-advice/career-development/types-of-business-letters

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. AggarwalR.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: McGraw Hill 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 : McGraw Hill 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