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 - COMPUTER SCIENCE AND 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 Computer Science and Engineering

B.E- Computer Science and Engineering

CURRICULUM AND SYLLABUS

REGULATION - 2023

(For students admitted during 2024-25)

VISION

To   provide an academically conducive environment for individuals to   develop astechnologically superior, socially conscious and nationally responsible citizens.

MISSION

M1: To develop our department as a center of excellence, imparting quality education, generating competent and skilled manpower.

M2: To prepare our students with high degree of credibility, integrity, ethical standards andsocial concern.

M3: To train our students to devise and implement novel systems based on Education andResearch.

Programme Educational Objectives(PEO)

PEO 1: Employment/Higher studies: To impart and disseminate sound knowledge to the students on the fundamentals of mathematics and advanced fields of computer science and interrelated disciplines to solve simple and complex engineering problems and train them to achieve sustainable growth in their professional career.

PEO 2: Discipline Knowledge: To enhance the ability of students to evaluate the specific requirements of software industry and provide innovative engineering solutions and efficient product designs.

PEO 3: Individual Skills: To facilitate the students to make use of their technical competency to identify and develop appropriate product design, development, testing, maintenance, analysis of problems and provide corrective measures.

PEO 4:3P's -Professional, Personality and Presentation: To enable the students to develop strong leadership qualities with aggressive optimism, multidisciplinary skills, excellent communication skills and function as effective and reliable team members giving importance to professional and ethical principles.

PEO 5: Environment: To inculcate in the students to associate in social networking, pursue continued learning of the latest developments in Computer Science and involve in higher research and contribute to the development of software industry and related engineering fields.

Program Outcomes (PO)

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

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

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

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

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

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

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

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

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

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

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

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

Programme Specific Outcomes(PSO)

PSO 1 (Professional Skills): To inculcate technical skills to analyze, design and implement software's related to algorithms, networking, web services, multimedia, big data analytics and recent topics of varying complexity.

PSO 2 (Problem-Solving Skills): To develop the capability to comprehend and solve the interdisciplinary problems through appropriate technology with the understanding of contemporary business environment

PSO 3 (Successful Career and Entrepreneurship): To develop an ability to utilize the latest technology and platforms to become a triumphant professional, successful entrepreneur and an urge for pursuing higher studies

B.E. - Computer Science and 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
Theory Cum Practical Courses							
3.	23HS1103	Communicative English and Language Skills I	HS	2/0/2	4	3	50/50
4.	23PH1103	Engineering Physics	BS	2/0/2	4	3	50/50
5.	23ES1102	Basic Electrical and Electronics Engineering	ES	3/0/2	5	4	50/50
Laboratory Courses							
6.	23ES1113	Programming in C Laboratory	ES	0/0/4	4	2	40/60
Mandatory Course							
7.	23TA1101	தமிழர் மரபு/ Heritage of Tamils	HS	1/0/0	1	1	60/40
8.	23HS1104	Interpersonal Communication skills I	EEC	0/0/2	2	0	0/100
9.	23HS1105	Quantitative Aptitude Practices I	EEC	0/0/1	1	0	0/100
				TOTAL	28	20	

S. No	COURSE CODE	COURSE TITLE	Category	L/T/P	Contact Hours	Credit	Ext / Int Weightage
Semester II							
Theory Courses							
1.	23MA1206	Complex Variables and Transforms	BS	3/1/0	4	4	60/40
2.	23ES1206	Programming in Python	ES	3/0/0	3	3	60/40
Theory Cum Practical Courses							
3.	23HS1203	Communicative English and Language Skills II	HS	2/0/2	4	3	50/50
4.	23CS1201	Web Application Development	PC	2/0/2	4	3	50/50
Laboratory Courses							
5.	23ES1215	Programming in Python Laboratory	ES	0/0/4	4	2	40/60
6.	23ES1212	Technical Skill Practices I	EEC	0/0/2	2	1	40/60
7.	23ES1114	Innovative Thinkingand Prototype Development Laboratory	ES	0/0/4	4	2	40/60
Mandatory Course							
8.	23TA1201	தமிழரும் தொழில்நுட்பமும் /Tamils and Technology	HS	1/0/0	1	1	60/40
9.		Mandatory Course I	MC	2/0/0	2	0	0/100
10.	23HS1204	Interpersonal Communication Skills II	EEC	0/0/2	2	0	0/100
11.	23HS1205	Quantitative Aptitude Practices II	EEC	0/0/1	1	0	0/100
				TOTAL	**31**	**19**	

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(S):

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, 9th Edition, New Delhi, 2015.
3. Bali N., Goyal M. and Walkins C., "Advanced Engineering Mathematics", Firewall Media (An imprint of Lakshmi Publications Pvtt. Ltd.,), New Delhi, 7th Edition, 2015.

REFERENCE BOOKS:

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

ONLINE COURSES / RESOURCES:

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

CO-PO MAPPING

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

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

		L	T	P	C
23ES1106	**PROGRAMMING IN 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 – PO MAPPING

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

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

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

COURSE OBJECTIVE:

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

UNIT I INFORMAL COMMUNICATION 6

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

ACTIVITY: Listening to self -introduction before the interview committee after listening modules.

UNIT II CONVERSATIONAL PRACTICE 6

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

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

UNIT III   OFFICIAL COMMUNICATIONS   6

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

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

UNIT IV   COMMUNICATION AT WORK PLACE   6

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

ACTIVITY: Listening to Group Discussion and sharing recommendation.

UNIT V   DEFINITIONS AND PRODUCT DESCRIPTION   6

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

ACTIVITY: Reading about the modern gadgets and describing them.

TOTAL :30 PERIODS

COURSE OUTCOME(S)

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. Cambridge University Press, Cambridge: Reprint 2011 3.
4. Means, L. Thomas and Elaine Langlois. English & Communication For Colleges. Cengage Learning ,USA:2007
5. Redston, Chris & Gillies Cunningham Face2Face (Pre-intermediate Student's Book& Workbook) Cambridge University Press, New Delhi: 2005.

WEB REFERENCES: (Only accessible Links)

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.

REFERENCES:

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

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

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

CO-PO MAPPING

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

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

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

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(S)

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 %

23ES1102	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	L	T	P	C
		3	0	2	4

COURSE OBJECTIVE:

- To learn the concepts related with Electrical circuits and Wiring
- To study the concept of electrical machines
- To understand basics of Semiconductor Devices
- To understand the basics of Sensors and Actuators
- To develop IOT infrastructure for Real time applications

UNIT I	BASIC ELECTRICAL CIRCUITS AND HOUSE WIRING	9

Electrical Quantities — Ohms Law — Kirchhoff"s Law — Series and Parallel Connections –Earthing and its Types- basic house wring - tools and components, different types of wiring, safety measures at home and industry. **Case Study** -staircase Wiring and ceiling fan Wiring.

UNIT II	ELECTRICAL MACHINES	9

Construction, Working Principle of Dc motors, Brushless dc motor, Permanent magnet DC Motor, stepper motor, Servo Motor (No Problems). -Application of motor in Industrial automation

UNIT III	SEMICONDUCTOR DEVICES AND CIRCUITS	9

PN junction diode -Zener diode — Half wave and Full wave rectifier, - BJT, MOSFET,IGBT- Characteristics- **Case Study**: SMPS in computer and UPS in Residential Application

UNIT IV	SENSORS AND ACTUATORS	9

Sensors: Temperature Sensor- Pressure Sensor-Proximity Sensor, Ultrasonic sensors. Actuators: Actuation using thermal forces, Actuation using shape memory Alloys, Actuation using piezoelectric crystals. **Case Study**: Integrated sensor and actuator systems in automation

UNIT V	EMERGING TECHNOLOGIES	9

Solar PV system- solar and battery powered Electric Vehicle - IOT Concept and its Functional blocks- Introduction to Arduino Uno. Case Study: Smart and Connected Cities: Smart Lighting- Smart Parking Architecture - Smart Traffic Control

TOTAL :45 PERIODS

COURSE OUTCOME(S)

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

CO1 Acquire basic knowledge on Basic Electrical circuits and House Wiring
CO2 Understand the construction, working principle and applications of DC and AC Machines
CO3 Acquire basic knowledge on semiconductor devices and their applications
CO4 Illustrate the concepts of Sensors and Actuators
CO5 Identify and analyse Various Emerging Technologies

CO6   Analyse the applications of IOT in real time scenario

TEXT BOOKS:

1. Hughes revised by Mckenzie Smith with John Hilcy and Keith Brown, Electrical and Electronics Technology, 8th Edition, Pearson, 2012.
2. R.J. Smith, R.C. Dorf, Circuits Devices and Systems, 5th Edition, John Wiley and sons, 2001
3. P. S. Dhogal, Basic Electrical Engineering – Vol. I & II, 42nd Reprint, McGraw Hill, 2012.
4. Clarence W. de Silva, "Sensors and Actuators: Engineering System Instrumentation", 2nd Edition, CRC Press, 2015
5. David Hanes, Gonzalo Salgueiro, Patrick Grossetete. Rob Barton and Jerome Henry, "IOT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press, 2017

REFERENCE BOOKS:

1. Del Toro, "Electrical Engineering Fundamentals" Pearson Education, New Delhi, 2007
2. Smarjit Ghosh, "Fundamentals of Electrical and Electronics Engineering", 2nd Edition 2007
3. Olivier Hersent, David Boswarthick, Omar Elloumi, ―The Internet of Things – Key applications and Protocols‖, Wiley, 2012

WEB REFERENCES:

1. https://electrical-engineering-portal.com/download-center/books-and-guides/electrical- engineering/basic-course
2. https://www.infoq.com/articles/internet-of-things-reference-architecture/

ONLINE COURSES / RESOURCES:

1. https://archive.nptel.ac.in/courses/117/106/117106108/
2. https://archive.nptel.ac.in/courses/108/105/108105155/
3. https://onlinecourses.nptel.ac.in/noc22_cs53/preview

LIST OF EXPERIMENTS   30 Hours

1. (i)Study of Electronic components and equipment"s – Resistor, colour coding (ii)Soldering practice – Components Devices and Circuits–Using general purpose PCB
2. Electrical House Wiring:

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

    (ii) Fluorescent lamp wiring

    (iii) Stair case wiring

    (iv)Study of Home Appliances- wiring and assembly

3. Measurement of electrical quantities – voltage, current, power & power factor in RLC circuit.
4. Design of Half wave Rectifier & Full wave Rectifier
5. Simulation of following circuits using suitable software (i)Seven segment LED display (ii)Stepper Motor control (iii)Traffic Light Control

6. 2D & 3D Electrical wiring Model using suitable Software.

SOFTWARE REQUIRED: Keil/Proteus/Fusion 360

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1		1					1
CO2	3	2	2	2	1		1					1
CO3	3	2	2	2	1		1					1
CO4	3	2	2	2	1		1					1
CO5	3	2	2	2	1		1					1
CO6	3	2	3	3	3		1					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 OUTCOME(S)
Upon successful completion of the course, students will be able to:
   CO1 Write, test, and debug simple C programs
   CO2 Implement C programs with conditionals and loops
   CO3 Develop C programs for simple applications making use arrays and strings
   CO4 Develop C programs involving functions, recursion, pointers, and structures and union
   CO5 Design applications using sequential and random access file processing
   CO6 Perform task as an individual and / or team member to manage the task in time

WEB REFERENCES

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

CO-PO MAPPING

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

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

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

UNIT – I LANGUAGE AND LITERATURE 3

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

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

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 3 MOVEMENT AND INDIAN CULTURE

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

		L	T	P	C
23TA1101	**தமிழர் மரபு**	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 3
வரை – சிற்பக் கலை

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

UNIT – III நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள் 3

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

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

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

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

Total : 15 PERIODS

TEXT-CUM REFERENCE BOOKS:

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

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

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

4. பொருநை - ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை)

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

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

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

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

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

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

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

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

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

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. 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(S)

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 New Delhi:S. Chand Publishing.
2. Abhijit guha(2016). Quantitative Aptitude for All Competitive Examinations, 6th edition. Noida : McGrawHill 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

23MA1206	COMPLEX VARIABLES AND TRANSFORMS	L	T	P	C
		3	1	0	4

COURSE OBJECTIVE:

- To understand the concepts of vectors as it gives the insight into how to trace along the different types of curves.
- To understand the standard technique of a complex variable theory in particular of analytics functions and its mapping property.
- Complex variable techniques have been used in a wide area of engineering
- To make the student appreciate the purpose of using Fourier transforms to create a new domain in which it is easier to handle the problem that is being investigated.
- To solve the problems in electronic circuits.

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

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

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

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

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

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

UNIT - IV   **FOURIER TRANSFORM**   **9+3**

Statement of Fourier integral theorem – Fourier transform pair – Fourier sine and cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval's identity.

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

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

TOTAL :   60 PERIODS

COURSE OUTCOME(S):

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

CO1   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.

CO2   Understanding analytic functions, harmonic functions, conformal mapping.

CO3   Determine the types of singularities, residues, contour integration.

CO4   Determine the Fourier transforms for a function and evaluates special integrals.

CO5   Solve differential equations using laplace transforms.

TEXT BOOKS:

1. Grewel. B.S, "Higher Engineering Mathematics", 43rd Edition, Khanna Publications, Delhi, 2014.
2. B.V. Ramana, " Higher Engineering Mathematics", McGraw Hill Education, India.
3. Bali N., Goyal M. and Walkins C., "Advanced Engineering Mathematics", Firewall Media (An imprint of Lakshmi Publications Pvtt. Ltd.,), New Delhi, 7th Edition, 2009.

REFERENCE BOOKS:

1. Kreyszig Erwin, Advanced Engineering Mathematics", John wiley and Sons, 10th Edition, New Delhi.
2. Jain R.K. and Iyengar S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 3rd Edition, 2007.
3. O'Neil, P.V. "Advanced Engineering Mathematics", Cengage Learning India Pvt. Ltd, New Delhi, 2007.
4. Sastry, S.S, "Engineering Mathematics", Vol.I& II, PHI LearnigPvt. Ltd, 4th Edition, New Delhi, 2014.
5. Wyile, R.C. and Barrett, L.C., "Advanced Engineering Mathematics "Tata McGraw Hill Education Pvt Ltd, 6thEdition, New Delhi, 2012.

CO-PO MAPPING

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

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

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   9
CONTROL STRUCTURES**

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 %**

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

REFERENCE BOOKS:

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

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

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

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

Cengage Learning, USA: 2007.

WEB REFERENCES:

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

REFERENCES:

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 %

23CS1201	WEB APPLICATION DEVELOPMENT	L	T	P	C
		2	0	2	3

COURSE OBJECTIVE:

- To understand the concepts and architecture of the World Wide Web.
- To understand and practice mark-up languages
- To introduce tools for creating interactive web pages
- To understand and practice web development using wordpress

UNIT - I   **WEB ESSENTIALS**   **4**

Clients, Servers and Communication – The Internet – Understanding the difference between internet and intranet– Basic Internet protocols – World Wide Web – HTTP Request Message – HTTP Response Message – Web Clients – Web Servers.

UNIT - II   **HTML 5.0**   **6**

HTML5 — Tables — Lists — Image — Iframes — HTML5 control elements — Semantic elements —Drag and Drop — Canvas — SVG — Audio — Video controls.

UNIT - III   **CASCADING STYLE SHEETS**   **6**

CSS3 — Inline, embedded and external style sheets — Rule cascading — Inheritance — Backgrounds — Border Images — Colors — Shadows — Text — Transformations — Transitions —Animations- Media Query.

UNIT -IV   **WORDPRESS FUNDAMENTALS**   **7**

Introduction to CMS And WordPress, WordPress Installation, WordPress Admin Creating Users, User Rights & Roles.

UNIT -V   **WORDPRESS DEVELOPMENT**   **7**

Creating Page and Post in Wordpress, WordPress Themes, Plugins, Menus, Widgets, SEO.

TOTAL: 30 PERIODS

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

- **CO1** Recall the concept of Internet and basic Internet Protocols
- **CO2** Understand the basic website design using HTML
- **CO3** Apply CSS to design an attractive webpage
- **CO4** Analyze the essential technologies for website development.
- **CO5** Evaluate Word press Installation and administration
- **CO6** Build web sites using wordpress tool

TEXT BOOKS:

1. Scobey, Pawan Lingras, "Web Programming and Internet Technologies - An E Commerce Approach", Jones & Bartlett Publishers, 2020
2. Brian Messenlehner, Jason Coleman, Building Web Apps with WordPress: 2019

REFERENCE BOOKS:

1. Andreas Maurer, HTML5 & CSS3: A Step-by-Step guide for beginners to build and design responsive and engaging websites with html5 and css3 , Kindle Edition,2020.
2. Deitel and Deitel and Nieto, —Internet and World Wide Web - How to Program,Prentice Hall, 2011.
3. Gopalan N.P. and Akilandeswari J. —Web Technology, Prentice Hall of India, 2011.

ONLINE COURSES / RESOURCES:

1. www.w3schools.com
2. www.codecademy.com
3. www.wordPress.com/org

LIST OF EXPERIMENTS

1. Create a web page with the following using HTML
   a. To embed a map in a web page
   b. To fix the hot spots in that map
   c. Show all the related information when the hot spots are clicked.
2. Create a Personal blog design using HTML Multimedia elements and CSS elements – (Audio, Video, Iframe, Image, External CSS for Look and Feel)
3. Create your own Resume using HTML 5 Tags.Add Styles to your Resume using CSS 3Properties and add CSS3 Animation to your profile
4. Create a web page with the following.
   a. Cascading style sheets.
   b. Embedded style sheets.
   c. Inline style sheets. Use our college information for the web pages.
5. Create a website for a small business using Wordpress
6. Create a course website using Wordpress
7. Mini Project : Suggested Topics(but not limited to)
   - Survey Form
   - Quiz Game
   - Event Website

TOTAL: 30 PERIODS

CO-PO MAPPING

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

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

		L	T	P	C
23ES1215	**PROGRAMMING IN PYTHON LABORATORY**	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/

23ES1114	INNOVATIVE THINKING AND PROTOTYPE DEVELOPMENT LABORATORY	L	T	P	C
		0	0	4	2

COURSE OBJECTIVE:

- To demonstrate the essence of agile development methods and create a GitHub repository.
- To acquire practical knowledge for Designing using Adobe Photoshop, COREL Draw.
- To Gain Knowledge, in CANVA Tools.
- Apply the basic knowledge of design thinking in project work.
- Apply iterative design methodologies to refine and improve solutions based on feedback, user testing, and evaluation of functional, aesthetic, and usability aspects.

LIST OF EXPERIMENTS

1. Introduction to GIT Setting a GIT repository. Create a repository in a GitHub for a team.

2. Design your college Logo using COREL Draw tools.

3. Design a visiting card using COREL Draw tools.

4. Adobe Photo Shop Tools – Magnetic Lasso Tool –image, Patch Tool – Smudge Tool, Blur-Filter Tool.
   a. Make Selections with the Magnetic Lasso Tool
   b. Replace unwanted content with the patch tool and Apply filter to it
   c. Work with the smudge tool to smooth and blend colors.
   d. Blur areas in an image with Blur tool.

5. Timeline ; Trimming adding, arranging, and trimming video clips, images, and audio tracks. Using CANVA Tools.

6. Learn basic CHAT GPT tools and perform Provide the text to ChatGPT and tell it what you're looking for/what you want it to find.

7. Prompt Engineering: Experiment with different types of prompts to see how the model responds. Try asking questions, starting conversations, or even providing incomplete sentences to see how the model completes them.

   Ex: Prompt: "You are a knowledgeable AI. Please answer the following question: What is the capital of England?"

8. Creative Writing: Use the model as a writing assistant. Provide the beginning of a story or a description of a scene, and let the model generate the rest of the content. This can be a fun way to brainstorm creative ideas.

Ex: Prompt: "In a world where gravity suddenly stopped working, people started floating upwards. Write a story about how society adapted to this new reality."

9. Design of 3D printing using Fusion 360 and product development.
10. Write CNC programming for CNC Lathe and Milling.
11. Create design for CNC router for ART cam software.
12. Create a PCB design for product Development
13. Develop The Mini Project Using Idea Lab.

TOTAL:60 PERIODS

COURSE OUTCOME(S):

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

CO 1 Define agile development methods in software development practices

CO 2 Identify the various tools used to Edit Videos using CANVA tools.

CO 3 Apply the Knowledge for Designing using Photo Shop ,COREL draw

CO 4 Implement the usage of ChatGPT and its tools.

CO 5 Design thinking using 3D Printer

CO 6 Develop a simple PCB boards using etching and milling Process

TEXT BOOKS:

1. Roger S. Pressman, "Software Engineering: A Practitioner's Approach", McGraw Hill International Edition, Nineth Edition, 2020.

2. Ulrich and Eppinger, Product Design and Development, 3rd Edition, McGraw Hill, 2004

3. The Big Book of Maker Skills: Tools & Techniques for Building Great Tech Projects. Chris Hackett. Weldon Owen; 2018.

4. The Total Inventors Manual (Popular Science): Transform Your Idea into a Top-Selling Product. Sean Michael Ragan, Weldon Owen; 2017

WEB REFFERENCES:

1. https://www.raypcb.com/video-electronics-pcb

2. https://www.coursera.org/courses?query=3d%20printing

3. https://www.coursera.org/courses?query=photoshop

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
CO1	3	2	3		3						3	
CO2	3	3	3		3						3	
CO3	3	3	3		3						2	
CO4	3	3	3		3						2	
CO5	2	3	3							3	3	
CO6	2	3	3							3	3	

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

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

UNIT – I   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

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.

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. 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(S):

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

CO1 Comprehend conversation and short talks delivered in English.

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

CO3 Read articles of a general kind in magazines and newspaper

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

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

CO6 Use appropriate words in a professional context.

CO-PO MAPPING

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

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

COURSE OBJECTIVE:

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

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

Module 1   Geometry and Mensuration   **3**

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

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

Logarithm - Average - time and work - time and distance

Module 3   Boats and streams   **3**

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

Module 4   Logical Reasoning - I   **3**

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

TOTAL : 12 PERIODS

COURSE OUTCOME:

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

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

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

TEXT BOOKS:

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

REFERENCE BOOK:

1. Sharma arun.(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