KONGU ENGINEERING COLLEGE

(Autonomous Institution Affiliated to Anna University, Chennai)

PERUNDURAI   ERODE – 638 060

TAMILNADU INDIA

Estd : 1984

REGULATIONS, CURRICULUM & SYLLABI – 2024

**(CHOICE BASED CREDIT SYSTEM AND
OUTCOME BASED EDUCATION)**

(For the students admitted from the academic year 2024 - 2025)

BACHELOR OF ENGINEERING DEGREE
IN
ELECTRONICS AND COMMUNICATION ENGINEERING

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
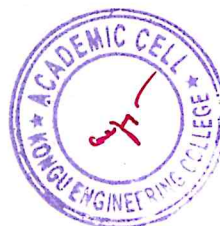

Assuring the Best

B.E. ELECTRONICS AND COMMUNICATION ENGINEERING CURRICULUM – R2024
(For the students admitted from the academic year 2024-25 onwards)

SEMESTER – I

Course Code	Course Title	CI L	CI T	LI P	TW	SL	TH	Credit	CA	ESE	Total	Category	Type
Theory/Theory with Practical													
24EGT11	English for Effective Communication - I	45	0	0	45	0	90	3	40	60	100	HS	C
24MAC11	Matrices and Ordinary Differential Equations	45	7	16	52	0	120	4	50	50	100	BS	A
24CYT13	Chemistry For Electronics And Computer Systems	45	0	0	45	0	90	3	40	60	100	BS	C
24CSC11	Problem Solving and Programming in C	45	0	30	45	0	120	4	100	0	100	ES	OT
24ECT11	Circuits and Networks	30	15	0	15	30	90	3	40	60	100	ES	A
24TAM01	Heritage of Tamils	15	0	0	15	0	30	1	100	0	100	HS	OT
Practical / Employability Enhancement													
24CYL13	Chemistry Laboratory for Electronics And Computer Systems	0	0	30	0	0	30	1	60	40	100	BS	
24GCL12	Foundation Laboratory – Electrical, IoT and Web Technologies	0	0	90	0	0	90	3	100	0	100	ES	
24MNT12	Quantitative Aptitude – I	30	0	0	0	0	30	0	100	0	100	MC	
24MNT11	Student Induction Program	0	0	90	0	0	90	0	100	0	100	MC	
Total Credits to be earned								22					

CI – Classroom Instructions, LI – Laboratory Instructions, TW – Term Work, SL – Self Learning, L – Lecture, T – Tutorial, P – Practical, C – Credit, TH – Total Hours, CA – Continuous Assessment, ESE – End Semester Examination.

Type: A – Analytical, D – Design using Hardware, S – Simulation using Coding, C – Concept, OC – Online course, OT - others
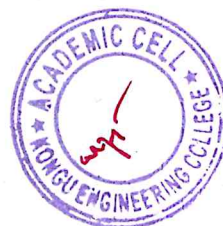
Signature of the Chairman
Board of Studies - ECE

B.E. ELECTRONICS AND COMMUNICATION ENGINEERING CURRICULUM – R2024
(For the students admitted from the academic year 2024-25 onwards)

SEMESTER – II

Course Code	Course Title	Hours / Semester CI L	Hours / Semester CI T	Hours / Semester LI P	TW	SL	TH	Credit	CA	ESE	Total	Category	Type
Theory/Theory with Practical													
24EGT21	English for Effective Communication - II	45	0	0	45	0	90	3	40	60	100	HS	C
24MAC21	Multivariable Calculus and Complex Analysis	45	7	16	52	0	120	4	50	50	100	BS	A
24PHT23	Physics For Electronics Engineering	45	0	0	45	0	90	3	40	60	100	BS	C
24MET11	Engineering Drawing	30	15	0	45	0	90	3	40	60	100	ES	A
24CSC23	Data Structures using C	45	0	30	45	0	120	4	50	50	100	ES	A
24TAM02	Tamils and Technology	15	0	0	15	0	30	1	100	0	100	HS	OT
Practical / Employability Enhancement													
24PHL23	Physics Laboratory For Electronics Engineering	0	0	30	0	0	30	1	60	40	100	BS	
24GCL11	Foundation Laboratory – Manufacturing, Design and Robotics	0	0	90	0	0	90	3	100	0	100	ES	
24MNT21	Quantitative Aptitude – II	30	0	0	0	0	30	0	100	0	100	MC	
24VEC11	Yoga and Values for Holistic Development	15	0	15	0	0	30	1	100	0	100	HS	
Total Credits to be earned								**23**					

CI – Classroom Instructions, LI – Laboratory Instructions, TW – Term Work, SL – Self Learning, L – Lecture, T – Tutorial, P – Practical, C – Credit, TH – Total Hours, CA – Continuous Assessment, ESE – End Semester Examination

Type: A – Analytical, D – Design using Hardware, S – Simulation using Coding, C – Concept, OC – Online course, OT - others
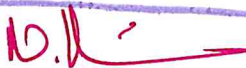
Signature of the Chairman
Board of Studies - ECE

B.E. ELECTRONICS AND COMMUNICATION ENGINEERING CURRICULUM – R2024
(For the students admitted from the academic year 2024-25 onwards)

SEMESTER – III

Course Code	Course Title	CI L	CI T	LI P	TW	SL	TH	Credit	CA	ESE	Total	Category	Type
Theory/Theory with Practical													
24MAT33	Probability and Random Process	45	15	0	60	0	120	4	40	60	100	BS	A
24ITC33	Programming in Python	45	0	30	45	0	120	4	40	60	100	ES	OT
24ECT31	Digital Electronics	45	0	0	0	45	90	3	40	60	100	PC	A
24ECT32	Electromagnetic Fields	45	0	0	45	0	90	3	40	60	100	PC	A
24ECT33	Electronic Devices	45	0	0	45	0	90	3	40	60	100	PC	OC
24GET31	Universal Human Values	30	0	0	30	0	60	2	100	0	100	HS	OT
Practical / Employability Enhancement													
24ECL31	Digital Electronics Laboratory	0	0	30	0	0	30	1	60	40	100	PC	
24ECL32	Electronic Devices Laboratory	0	0	30	0	0	30	1	60	40	100	PC	
24GEP31	Mini Project - I	0	0	30	0	0	30	1	100	0	100	EC	
Total Credits to be earned								22					

CI – Classroom Instructions, LI – Laboratory Instructions, TW – Term Work, SL – Self Learning, L – Lecture, T – Tutorial, P – Practical, C – Credit, TH – Total Hours, CA – Continuous Assessment, ESE – End Semester Examination.

Type: A – Analytical, D – Design using Hardware, S – Simulation using Coding, C – Concept, OC – Online course, OT - others

24EGT11 - ENGLISH FOR EFFECTIVE COMMUNICATION - I

(Common to all Engineering and Technology Branches)

Programme & Branch	All B.E/B.Tech Branches	Sem	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	1	HS	45	0	0	45	90	3

Preamble	This course is designed to enhance the communication skills and verbal aptitude in English language required for various workplace communication and social interactions.

Unit – I	Grammar, Verbal Aptitude, Listening, Speaking, Reading & Writing	9

Grammar: Parts of Speech – Articles – Determiners – **Verbal Aptitude:** Synonyms and Antonyms – Selecting Words – **Listening:** Listening and Filling in Information – Speech Units – **Speaking:** Introducing Oneself – Discussion on Social Media Etiquette – **Reading:** Importance of Good Communication – Comprehension and Inference, Reading for facts and opinions – Building a Positive Attitude: An Excerpt from *You Can Win* – **Writing:** Email Etiquette – Email Writing – Responding to Emails

Unit – II	Grammar, Verbal Aptitude, Listening, Speaking, Reading & Writing	9

Grammar: Types of Sentences – Assertive, Interrogative, Imperative and Exclamatory – Question Tags– **Verbal Aptitude:** Prefixes and Suffixes – Collocations – Idiomatic Expressions – **Listening:** Identifying main and Secondary Points – **Speaking:** Asking Questions – Role Play – **Reading:** Reading for Comprehension – Verbal and Non-Verbal Communication – Winning Strategies: An Excerpt from *You Can Win*- **Writing:** Descriptive Writing – Product/Process Description – Letter Writing: Formal Letters – Seeking Permission and Inviting Chief Guest

Unit – III	Grammar, Verbal Aptitude, Listening, Speaking, Reading & Writing	9

Grammar: Tenses – Phrasal Verbs– **Verbal Aptitude:** Jumbled Sentences – Sentence Formation– **Listening:** Taking Notes from a Discussion – **Speaking:** Retelling an Incident – Discussing Tourist Destinations – **Reading:** Process of Communication–Scanning - Motivating Yourself and Others Every Day: An Excerpt from *You Can Win* – **Writing:** Paragraph Writing: Narrative and Compare & Contrast

Unit – IV	Grammar, Verbal Aptitude, Listening, Speaking, Reading & Writing	9

Grammar: Prepositions – Transitional Words/Phrases – Discourse Markers – **Verbal Aptitude:** One Word Substitution - Sentence Completion – **Listening:** Listening for Specific Information – **Speaking:** Small Talk–Telephonic Conversations– **Reading:** Channels of communication – Building Positive Self-Esteem and Image: An Excerpt from *You Can Win* – **Writing:** Instructions – Recommendations and Suggestions

Unit – V	Grammar, Verbal Aptitude, Listening, Speaking, Reading & Writing	9

Grammar: Subject Verb Agreement – Gerunds and Infinitives– **Verbal Aptitude:** Homonyms, Homophones and Homographs – Cloze Test using Verb Forms, Prepositions and Articles – **Listening:** Listening and Identifying Parts from a Description – **Speaking:** Agreeing and Disagreeing – **Reading:** Skimming – Reading to Summarize – Setting and Achieving your Goals: An Excerpt from *You Can Win* – **Writing:** Transcoding: Identifying Trends and Patterns in Graphs and Expressing with Graph Specific Vocabulary

TEXT BOOK:

1.	Sudharshana N P and Savitha C, *English for Technical Communication*, 2nd Edition, Cambridge University Press, New Delhi, 2016.

REFERENCES:

1.	Ashraf Rizvi. Effective Technical Communication, 2nd Edition, McGraw-Hill India, 2017.
2.	S. P. Dhanavel. English and Communication Skills for Students of Science and Engineering, Orient Black Swan Publishers, Hyderabad, 2009.
3.	Shiv Khera. You Can Win: A Step-by-Step Tool for Top Achievers. Bloomsbury Publishing, 2018.

* includes Term Work (TW) & Assignments, Tutorials and Case Studies

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	learn and use various aspects of English vocabulary to perform well in verbal aptitude tests of different types	Applying (K3)
CO2	listen and understand different spoken discourses	Applying (K3)
CO3	present ideas clearly and confidently in formal and informal conversations and discussions	Creating (K6)
CO4	comprehend the given text and respond appropriately for technical and professional purposes	Understanding (K2)
CO5	select appropriate words , phrases and grammatical units and apply them in both spoken and written communication	Analyzing (K4)

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1						1		1	3	1	1		
CO2								1	3		1		
CO3								2	3	1	2		
CO4						1			3	1	2		
CO5									3		2		

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN – THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1	-	35	50	-	-	15	100
CAT2	-	45	35	-	-	20	100
CAT3	-	30	35	35	-	-	100
ESE	-	20	40	20	-	20	100

* ±3% may be varied (CAT 1,2& 3 – 50 marks & ESE – 100 marks)

Signature of the Chairman
Board of Studies - S & H (English)

24MAC11 - MATRICES AND ORDINARY DIFFERENTIAL EQUATIONS
(Common to all Engineering and Technology branches)

Programme & Branch	All B.E/B.Tech Branches	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	1	BS	45	7	16	52	120	4

Preamble	To provide the skills to the students for solving different real time problems by applying matrices and ordinary differential equations.	
Unit – I	**Matrices:**	**9**

Introduction – Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values and Eigen vectors (without proof) – Cayley – Hamilton theorem (Statement and applications only) - Orthogonal matrices – Orthogonal transformation of a symmetric matrix to diagonal form – Quadratic form – Nature of Quadratic forms - Reduction of quadratic form to canonical form by orthogonal transformation.

Unit – II	**Ordinary Differential Equations:**	**9**

Introduction – Solution of First order differential equations: Exact differential equations – Leibnitz's Linear Equation – Bernoulli's equation – Clairaut's equation - Applications: Law of natural growth and decay.

Unit – III	**Ordinary Differential Equations of Higher Order:**	**9**

Linear differential equations of second and higher order with constant coefficients - Particular Integrals for the types: e^{ax} – $\cos ax$ / $\sin ax$ – x^n – $e^{ax}x^n$, $e^{ax}\sin bx$ and $e^{ax}\cos bx$ – Differential Equations with variable coefficients: Euler-Cauchy's equation – Legendre's equation.

Unit – IV	**Applications of Ordinary Differential Equations:**	**9**

Method of variation of parameters – Simultaneous first order linear equations with constant coefficients – Applications of differential equations: Simple harmonic motion – Electric circuits (Differential equations and associated conditions need to be given).

Unit – V	**Laplace Transform:**	**9**

Introduction – Conditions for existence – Laplace transform of elementary functions – Basic properties – Derivatives and integrals of transforms – Transform of periodic functions - Inverse Laplace transform: Inverse Laplace transform of elementary functions – Partial fraction method – Convolution Theorem – Applications: Solution of linear ODE of second order with constant coefficients.

LIST OF EXPERIMENTS / EXERCISES:

1.	Introduction to MATLAB
2.	Computation of eigen values and eigen vectors
3.	Solving first order ordinary differential equations
4.	Solving higher order ordinary differential equations
5.	Solution of Simultaneous first order ODEs
6.	Solving second order ODE by variation of parameters
7.	Determining Laplace and inverse Laplace transform of basic functions
8.	Solution of Second order ODE by employing Laplace transforms

TEXT BOOK:

1.	Kandasamy P., Thilagavathy K. and Gunavathy K., "Engineering Mathematics For First Year B.E/B.Tech", Reprint Edition 2016, S.Chand and Co., New Delhi.

REFERENCES/ MANUAL / SOFTWARE:

1.	Kreyszig E, "Advanced Engineering Mathematics ", 10th Edition, John Wiley, New Delhi, India, 2016.
2.	Ramana B V, "Higher Engineering Mathematics", 1st Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2018.
3.	Duraisamy C., Vengataasalam S., Arun Prakash K. and Suresh M., "Engineering Mathematics - I", 2nd Edition, Pearson India Education, New Delhi, 2018.
4.	Grewal B.S., "Higher Engineering Mathematics" 44thEdition, Khanna Publishers, New Delhi, 2018.
5.	Matrices and Ordinary Differential Equations Laboratory Manual.

*includes Term Work (TW) & Online / Certification course hours

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Use the matrix algebra methods and MATLAB for solving practical problems.	Applying (K3) Manipulation (S2)
CO2	Identify the appropriate method for solving first order ordinary differential equations.	Applying (K3) Manipulation (S2)
CO3	Solve higher order linear differential equations with constant and variable coefficients.	Applying (K3) Manipulation (S2)
CO4	Apply the concept of ordinary differential equations for modeling and finding solutions to engineering problems.	Applying (K3) Manipulation (S2)
CO5	Apply Laplace Transform to solve complex engineering problems.	Applying (K3) Manipulation (S2)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2		3								
CO2	3	3	2		3								
CO3	3	3	2		3								
CO4	3	3	2		3								
CO5	3	3	3		3								

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		40	60				100
CAT2		40	60				100
CAT3		30	70				100
ESE		30	70				100

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks & ESE – 100 marks)

Signature of the Chairman
Board of Studies - S4 H

24CYT13 - CHEMISTRY FOR ELECTRONICS AND COMPUTER SYSTEMS										
(Common to EEE, EIE, ECE, CSE, CSD, IT, AIDS & AIML branches)										
Programme & Branch	B.E - EEE, EIE, ECE, CSE, CSD, B.Tech - IT, AIDS & AIML branches	Sem.#	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	1 / 2	BS	45	0	0	45	90	3

Preamble	This course aims to emphasize the engineering students to realize the importance of water technology, energy storage devices, organic electronic materials, fabrication of PCBs, insulating materials and the need for e-waste management. It aims to impart the fundamentals of chemistry towards innovations in engineering and also for societal applications.

Unit – I	WATER TECHNOLOGY	9

Introduction - types of water - hardness of water- expression of hardness - units of hardness –water quality parameters-estimation of hardness of water by EDTA method – determination of alkalinity - DO, BOD and COD (Definition and Significance only) - disadvantages of using hard water in industry: scale, sludge and boiler corrosion - softening of water: Internal treatment process - carbonate and calgon conditioning - External treatment method - demineralization process and reverse osmosis.

Unit – II	ENERGY STORAGE DEVICES	9

Batteries: Introduction - discharging and charging of battery - characteristics of battery - types of batteries – primary battery: silver button cell - secondary battery: Ni-Cd battery -modern battery: lithium-ion battery - choice of batteries for electric vehicles. **Fuel Cells:** Introduction - Importance and classification of fuel cells - description, principle, components and working of fuel cells: alkaline fuel cell, phosphoric acid fuel cell and direct methanol fuel cell - comparison of batteries with fuel cells.

Unit – III	ORGANIC ELECTRONIC MATERIALS	9

Organic Electronic Materials: Introduction – types of organic semiconducting materials – comparison of organic with inorganic semiconducting materials – organic light emitting diodes – construction and working mechanism – comparison of LCD vs OLED. Fabrication of PCB: Introduction – electroplating (copper) process - electroless plating (nickel) process – printed circuit board (PCB) fabrication.

Unit – IV	INSULATING MATERIALS	9

Introduction - requirements - classification (solid, liquid & gas) - preparation, properties and applications of solid inorganic insulator: ceramic materials - solid organic insulator: epoxy resin - liquid insulator: transformer oil - gas insulator: SF_6 - electrical resistivity - factors influencing electrical resistivity of materials - composition, properties and applications of high resistivity materials: Nichrome - polymers as electrical insulator.

Unit – V	E-WASTE AND ITS MANAGEMENT	9

Introduction - E- Waste definition - sources of e-waste – hazardous substances in e-waste - effects of e-waste on environment and human health - need for e-waste management - waste minimization techniques for managing e-waste – chemistry of recycling of e-waste (magnetic separation, eddy current, density separation - recovery of metals using acid leaching process) - disposal treatment methods of e- waste - Incineration, pyrolysis, land fill - global scenario of e-waste – e-waste in India- case studies.

TEXT BOOK:

1.	Roussak , O.V. Gesser, H. D. " Applied Chemistry: A Textbook for Engineers and Technologists", 2nd Edition ,Springer, 2013, for Unit I, II.
2.	Palanisamy P.N., Manikandan P., Geetha A., Manjula Rani K., Kowshalya V.N., "Chemistry for Engineering", Revised Edition, Pearson Education, New Delhi, 2024,for Units III, IV, V.

REFERENCES:

1.	Payal B. Joshi, Shashank Deep, "Engineering Chemistry", Oxford University Press, New Delhi, 2019.
2.	Shuichiro Ogawa, "Organic Electronics Materials and Devices", 1st Edition, Springer, 2015.

*includes Term Work(TW) & Online / Certification course hours

1st sem for EEE, EIE, ECE & 2nd sem for CSE, CSD, IT, AIDS & AIML

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	analyze the water quality parameters for suitability of industrial and domestic applications.	Analysing (K4)
CO2	examine the chemistry of energy storing devices and meeting the future prospectus of energy storage.	Analysing (K4)
CO3	simplify the working mechanism of organic electronic materials and apply the concept of plating techniques in PCBs fabrication.	Analysing (K4)
CO4	identify the suitable insulating materials for industrial applications.	Analysing (K4)
CO5	categorize the e-waste and reduce its impacts on future environment.	Analysing (K4)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	2	1		1							
CO2	3	2	1	1									
CO3	3	2	1	1									
CO4	3	2	1	1									
CO5	3	2	3	1		2	1						

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		40	50	10			100
CAT2		40	50	10			100
CAT3		40	50	10			100
ESE		40	50	10			100

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks & ESE – 100 marks)

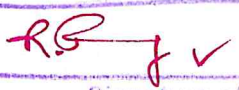Signature of the Chairman
Board of Studies -

24CSC11 - PROBLEM SOLVING AND PROGRAMMING IN C

Programme & Branch	All BE/BTech Engineering & Technology branches, except CSE, IT,CSD, AI&ML, AI&DS	Sem	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	1	ES	45	0	30	45	120	4

Preamble	The course is designed for use by freshmen students taking their first course in programming. It deals with the techniques needed to practice computational thinking, the art of using computers to solve problems and the ways the computers can be used to solve problems. This course also focuses on developing programming skills using C language.

Unit – I	Introduction to Computer and Problem Solving:	9

Overview of computers: Types, Generations, Characteristics, Basic computer Organization – Problem solving techniques: Algorithms - Flowcharts – Pseudo codes – Structuring the logic: Sequential, selection and repetitive structure

Unit – II	Introduction to C and Control Statements:	9

The structure of a C program – Compiling and executing C program – C Tokens – Character set in C – Keywords – identifiers- Basic data Types – Variables – constants – Input / Output statements – operators - decision making and looping statements

Unit – III	Arrays and Functions:	9

Declaring, initializing and accessing arrays – operations on arrays – Two dimensional arrays and their operations. Functions : Introduction- Using functions, function declaration and definition – function call – return statement – passing parameters to functions: basic data types and arrays – storage classes – recursive functions

Unit – IV	Strings and Pointers:	9

Strings :Introduction – operations on strings : finding length, concatenation, comparing and copying – string and character manipulation functions, Arrays of strings. Pointers: declaring pointer variables – pointer expression and arithmetic, pointers and 1D arrays , pointers and strings

Unit – V	User-defined Data Types and File Handling:	9

User-defined data types: Structure: Introduction – nested structures– arrays of structure – structure and functions - unions – enumerated data type. File Handling: Introduction - opening and closing files – reading and writing data to files -Manipulating file position indicator : fseek(), ftell() and rewind()

LIST OF EXPERIMENTS / EXERCISES:

1.	Writing algorithms and drawing flowcharts using Raptor Tool for problems involving sequential, Selection and repetition structures
2.	Programs for demonstrating the use of different types of format Specifiers
3.	Programs for demonstrating the use of different types of operators like arithmetic, logical, relational and ternary operators
4.	Programs for demonstrating using decision making statements
5.	Programs for demonstrating using repetitive statements
6.	Programs for demonstrating one-dimensional array
7.	Programs for demonstrating two-dimensional array
8.	Programs to demonstrate modular programming concepts using functions
9.	Programs to demonstrate strings (Using built-in and user-defined functions)
10.	Programs to illustrate the use of pointers
11.	Programs to illustrate the use of structures and unions.
12.	Programs to implement file Handling

*includes Term Work(TW) & Online / Certification course hours

TEXT BOOK:	
1.	Reema Thareja, "Programming in C ", 2nd Edition, Oxford University Press, New Delhi, 2018

REFERENCES/ MANUAL / SOFTWARE:	
1.	Yashavant Kanetkar, "Let us C", 16th Edition, BPB Publications, 2018.
2.	Sumitabha Das, "Computer Fundamentals and C Programming", 1st Edition, McGraw Hill, 2018.
3.	Balagurusamy E., "Programming in ANSI C", 7th Edition, McGraw Hill Education, 2017.
4.	Behrouz A. Forouzan & Richard F.Gilberg, "Computer Science A Structured Programming Approach Using C", 3rd Edition, Cengage,2017.
5.	https://www.cprogramming.com/tutorial/c-tutorial.html

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	apply problem-solving techniques to express the solutions for the real world problems.	Applying (K3) Precision (S3)
CO2	develop simple C programs using appropriate looping and control statements	Applying (K3) Precision (S3)
CO3	develop simple C programs using the concepts of arrays and modular programming	Applying (K3) Precision (S3)
CO4	apply the concepts of pointers and develop C programs using strings and pointers	Applying (K3) Precision (S3)
CO5	make use of user-defined data types and file concepts to solve real world problems	Applying (K3) Precision (S3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	1	1					1	1	1		
CO2	3	2	2	1					1	1	1		
CO3	3	2	2	1					1	1	1		
CO4	3	2	2	1					1	1	1		
CO5	3	2	2	1					1	1	1		

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

Signature of the Chairman
Board of Studies - CSE

P.Kalaivani

24ECT11-CIRCUITS AND NETWORKS

Programme & Branch	B.E & Electronics and Communication Engineering	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	1	PC	45	0	0	45	90	3

Preamble	This course provides an insight on basic laws and theorems to solve different DC, AC circuits and networks and to expose the rudiments of the course which is essential for subsequent courses.

Unit – I	DC Circuits and Steady State Analysis :	9

Review of Current Electricity and basic Kirchoff's Laws- Star-Delta Transformation -Mesh Analysis-Nodal Analysis - Superposition Theorem-Thevenin Theorem - Norton Theorem-Maximum Power Transfer Theorem-Reciprocity Theorem

Unit – II	Introduction to Single Phase AC Circuits:	9

The Sine Wave- Angular relations of Sine wave-Sine wave equations - Phasor relations in pure resistor, inductor and capacitor-Complex impedance and phasor diagram-Series, Parallel and Compound circuits-Instantaneous Power- Average Power-Apparent Power-Reactive Power-The Power Triangle – Power Factor

Unit – III	Transient Analysis:	9

Introduction to Laplace Transforms-Initial value and Final value Theorem-DC response of RL, RC and RLC Circuits – Sinusoidal response of RL and RC circuits.

Unit – IV	Resonance:	9

Series Resonance-Impedance and Phase Angle of a Series Resonant Circuit-Voltages and Currents in a Series Resonant Circuit-Bandwidth of an RLC circuit-Quality Factor(Q) and its Effect on Bandwidth-Parallel Resonance-Resonant Frequency for a Tank Circuit- Q-Factor of Parallel Resonance.

Unit – V	Two Port Network:	9

Two-port Network-Open-Circuit Impedance (Z) Parameters-Short-Circuit Admittance (Y) Parameters-Transmission (ABCD) Parameters-Hybrid (H) Parameters-Lattice Network.
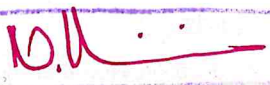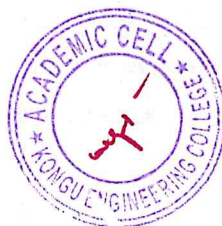
TEXT BOOK:

1.	Sudhakar A. and Shyammohan S. Palli, "Circuits and Networks Analysis and Synthesis", 5th Edition, McGraw-Hill Education, New Delhi, 2015.- https://www.mheducation.co.in/circuits-and-networks-9789339219604-india

REFERENCES:

1.	Hayt W.H., Kemmerly J.E., Durbin S.M., "Engineering Circuit Analysis", 9th Edition, Tata McGraw-Hill, New Delhi, 2020. https://www.mheducation.co.in/engineering-circuit-analysis-9789390185139-india
2.	Ravish R. Singh, "Network Analysis and Synthesis",2nd Edition,McGraw-Hill Education, New Delhi, 2019 https://www.mheducation.co.in/network-analysis-and-synthesis-9789353166724-india#tab-label-product-description-title

	COURSE OUTCOMES: On completion of the course, the students will be able to	BT Mapped (Highest Level)
CO1	apply the knowledge of basic laws to find circuit parameters of DC circuits and Identify the phasor relations and power analysis of lumped elements..	Applying (K3)
CO2	apply various network theorems and simplify the DC circuits.	Applying (K3)
CO3	apply various input signals and analyze the transient response of RL,RC and RLC circuits.	Applying (K3)
CO4	Solve series and parallel resonant circuits.	Applying (K3)
CO5	determine the various parameters of a two port network.	Applying (K3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2									2	3	2
CO2	3	2									2	3	2
CO3	3	3	2								2	3	2
CO4	3	2									2	3	2
CO5	3	2									2	3	2

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		30	70				100
CAT2		30	70				100
CAT3		25	75				100
ESE		25	75				100

* ±3% may be varied (CAT 1,2,3 – 50 marks & ESE – 100 marks)

Signature of the Chairman
Board of Studies - ECE

24TAM01- HERITAGE OF TAMILS

(Common to All Engineering and Technology Branches)

Programme & Branch	All B.E/B.Tech Branches	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	NIL	1	HS	15	0	0	15	30	1

Preamble	The objective of this course is to impart knowledge about Tamil language, literature, paintings, sculptures, folk arts, heroic games, doctrines, contribution of Tamils to Indian culture.

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 nayanmars - forms of minor poetry - development of modern literature in tamil - contribution of bharathiyar and bharathidhasan.

UNIT II	Heritage - Rock Art Paintings to Modern Art – Sculpture	3

Hero stone to modern sculpture - bronze icons - tribes and their handicrafts - art of temple car making - - massive terracotta sculptures, village deities, thiruvalluvar statue at kanyakumari, making of musical instruments - mridhangam, parai, veenai, yazh and nadhaswaram - role of temples in social and economic life of tamils.

UNIT III	Folk and Martial Arts	3

Therukoothu – karagattam - villu pattu - kaniyan koothu – oyillattam - leather puppetry – silambattam – valari - tiger dance - sports and games of tamils.

UNIT IV	Thinai Concept of Tamils	3

Flora and fauna of tamils & aham and puram concept from tholkappiyam and sangam literature - aram concept of tamils - education and literacy during sangam age - ancient cities and ports of sangam age - export and import during sangam age - overseas conquest of cholas.

UNIT V	Contribution of Tamils to Indian National Movement and Indian Culture	3

Contribution of tamils to indian freedom struggle - the cultural influence of tamils over the other parts of india – self-respect movement - role of siddha medicine in indigenous systems of medicine – inscriptions & manuscripts – print history of tamil books.

TEXT BOOK:

1.	S.Muthuramalingam, M.Saravanakumar, Heritage of Tamils, Yes Dee Publishing Pvt Ltd, 2023, for Units I,II,III,IV,V.

REFERENCES:

1.	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukarasu) (Published by : International Institute of Tamil Studies).
2.	The Contribution of Tamil of the Tamils to Indian Culture(Dr.M.Valarmathi)(Puplished by International Institute of Tamil Studies).
3.	Keeladi – 'Sangam City C ivilzation on the banks of river Vaigai; (Jointly Published by: Department of Archaeology & Tamilnadu Text Book and Educational Services Corporation, Tamilnadu).

*includes Term Work(TW) & Online / Certification course hours

COURSE OUTCOMES: படிப்பை முடித்தவுடன், மாணவர்கள்		BT Mapped (Highest Level)
CO1	explain valuable concepts in language and literature of tamils.	Understanding (K2)
CO2	illustrate about the tamils sculpture and their paintings.	Understanding (K2)
CO3	summarize about the tamils folk and martial arts.	Understanding (K2)
CO4	explain the thinai concept of tamils.	Understanding (K2)
CO5	explain the contribution of Tamils to the Indian National Movement and Indian culture.	Understanding (K2)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1						2	3	2	2		3		
CO2						2	3	2	2		3		
CO3						2	3	2	2		3		
CO4						2	3	2	2		3		
CO5						2	3	2	2		3		

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN – THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1	40	60					100
CAT2	40	60					100
CAT3	40	60					100
ESE	NA						

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks)

Signature of the Chairman
Board of Studies - S & H (chemistry)

24TAM01-தமிழர் மரபு										
(Common to All Engineering and Technology Branches)										
Programme & Branch	All B.E/B.Tech Branches	Sem.	Category	L	T	P	SL*	Total	Credit	
Prerequisites	NIL	1	HS	15	0	0	15	30	1	

Preamble	தமிழர்களின் மொழி, இலக்கியம், ஓவியங்கள், சிற்பக்கலைகள், நாட்டுப்புறக் கலைகள், வீர விளையாட்டுக்கள், திணைக் கோட்பாடுகள், இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பைப் பற்றிய அறிவை வழங்குவதே இந்த பாடத்தின் நோக்கமாகும்.	
அலகு - I	மொழி மற்றும் இலக்கியம்	3
இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ் செவ்விலக்கியங்கள் - சங்க இலக்கியத்தின் சமயச் சார்பற்ற தன்மை - சங்க இலக்கியத்தில் பகிர்தல் அறம் - திருக்குறளில் மேலாண்மைக் கருத்துக்கள் - தமிழ் காப்பியங்கள், தமிழகத்தில் சமண பெளத்த சமயங்களின் தாக்கம் - பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் - தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.		
அலகு - II	மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை - சிற்பக் கலை	3
நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - தேர் செய்யும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனையில் திருவள்ளுவர் சிலை - இசைக் கருவிகள் - மிருதங்கம், பறை, வீணை, யாழ், நாதஸ்வரம் - தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.		
அலகு - III	நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுக்கள்	3
தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஒயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.		
அலகு - IV	தமிழர்களின் திணைக் கோட்பாடுகள்	3
தமிழகத்தின் தாவரங்களும், விலங்குகளும் - தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் - தமிழர்கள் போற்றிய அறக்கோட்பாடு- சங்கக்காலத்தில் தமிழகத்தில் எழுத்தறிவும் கல்வியும் - சங்ககால நகரங்களும் துறை முகங்களும் - சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - கடல்கடந்த நாடுகளில் சோழர்களின் வெற்றி.		
அலகு - V	இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு	3
இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு - இந்தியாவின் பிறபகுதிகளில் தமிழ் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில் சித்த மருத்துவத்தின் பங்கு - கல்வெட்டுகள், கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.		

TEXT BOOK:

1.	ஆ. பூபாலன், தமிழர் மரபு, VRB Publishers Pvt Ltd, 2022,அலகு I,II,III,IV,V.

REFERENCES:

1.	தமிழக வரலாறு- மக்களும் பண்பாடும்- கே கே பிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்)
2.	கணினித்தமிழ் - முனைவர் இல. சுந்தரம் (விகடன் பிரசுரம்)
3.	கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்.(தொல்லியல் துறை வெளியீடு)
4.	பொருநை - ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)

*includes Term Work(TW) & Online / Certification course hours

COURSE OUTCOMES: படிப்பை முடித்தவுடன், மாணவர்கள்		BT Mapped (Highest Level)
CO1	தமிழ் மொழி மற்றும் இலக்கியத்தில் மதிப்புமிக்க கருத்துக்களை விளக்க முடியும்.	Understanding (K2)
CO2	தமிழர்களின் சிற்பம் மற்றும் அவர்களின் ஓவியங்கள் பற்றி விளக்க முடியும்.	Understanding (K2)
CO3	தமிழர்களின் நாட்டுப்புற மற்றும் தற்காப்புக் கலைகளைப் பற்றி சுருக்கமாகக் கூற முடியும்.	Understanding (K2)
CO4	தமிழர்களின் திணைக் கோட்பாடுகளைப் பற்றி விளக்க முடியும்.	Understanding (K2)
CO5	இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு பற்றி விளக்க முடியும்.	Understanding (K2)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1						2	3	2	2		3		
CO2						2	3	2	2		3		
CO3						2	3	2	2		3		
CO4						2	3	2	2		3		
CO5						2	3	2	2		3		

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN – THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1	40	60					100
CAT2	40	60					100
CAT3	40	60					100
ESE	NA						

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks)

Signature of the Chairman
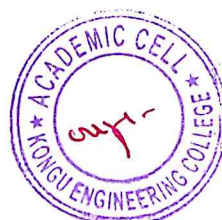Board of Studies - S & H (chemistry)

24CYL13 – CHEMISTRY LABORATORY FOR ELECTRONICS AND COMPUTER SYSTEMS

(Common to EEE, EIE, ECE, CSE, CSD, IT, AIDS & AIML branches)

Programme & Branch	B.E & EEE, EIE, ECE, CSE, CSD, B.Tech & IT, AIDS & AIML branches	Sem.#	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	1 / 2	BS	0	0	30	0	30	1

Preamble	This course aims to impart the basic concepts of volumetric, conductometric, spectrophotometric and pH metry experiments for the estimation of given samples and thereby, to improve the analytical skills. This course also aims to impart the knowledge on hardness, DO, COD, alkalinity, Fe^{2+}, Cu^{2+} and Cr^{6+} in computer systems.

LIST OF EXPERIMENTS / EXERCISES:

1.	Assessment of the given water sample for the suitability of drinking / industrial purpose by estimating the carbonate, non-carbonate and total hardness by EDTA method.
2.	Estimation of type and amount of alkalinity present in the given river/bore well water sample.
3.	Perform Winkler's method for the determination of dissolved oxygen in the given wastewater sample.
4.	Determination of COD in the given water sample.
5.	Estimation of strength and amount of acid in a given solution using pH meter.
6.	Determination of strength and amount of mixture of acids present in the given solution using Conductivity meter.
7.	Determination of concentration of Nickel by Spectrophotometric method.
8.	Estimation of copper content from discarded PCB's by Iodometric method.
9.	Determination of iron present in the given sample by permanganometric method.
10.	Volumetric estimation of chromium from electroplating sludge using permanganometric method.
11.	Electroplating process (Demonstration).
12.	Report preparation -based on the data received from the analysed water quality parameters (Demonstration).

REFERENCES/ MANUAL /SOFTWARE:

1.	Palanisamy P.N., Manikandan P., Geetha A. and Manjula Rani K., "Chemistry Laboratory Manual", 1 st Edition, Rajaganapathy Publishers, Erode, 2024.

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	estimate the amount of hardness, alkalinity, DO and COD present in the given sample.	Analyzing (K4), Precision (S3)
CO2	interpret the experimental results obtained from conductivity meter and pH meter.	Analyzing (K4), Precision (S3)
CO3	demonstrate the determination of Nickel by Spectrophotometer, Copper by Iodometry, Iron and Chromium by Permanganometry.	Analyzing (K4), Precision (S3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	2	3	2		2	1						
CO2	2	2	3	2		2	1						
CO3	2	2	3	2		2	1						

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

*includes Term Work(TW) & Online / Certification course hours

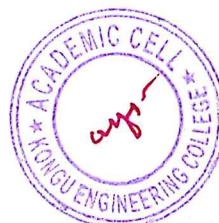# 1st sem for EEE, EIE, ECE & 2nd sem for CSE, CSD, IT, AIDS & AIML

Signature of the Chairman
E   rd of Studies - Sout

24GCL12 - FOUNDATION LABORATORY – ELECTRICAL, IOT AND WEB TECHNOLOGIES

(Common to all BE/BTech branches)

Programme & Branch	All BE/BTech Branches	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	1/2	ES	0	0	90	0	90	3
Preamble	This course is designed to provide a foundational knowledge on engineering with hands-on experience on the house wiring, Internet of Things and Web Technologies.								

LIST OF EXPERIMENTS / EXERCISES:

PART A – Electrical Installation (30 Hours)

1.	Determination of load currents and select suitable components for Protection
2.	Develop a wiring circuit for incandescent lamp and fluorescent lamp using Simple and Staircase Wiring
3.	Develop and Investigate wiring circuits for Calling Bell System and Dimmable Light
4.	Create wiring circuit for single phase motor
5.	Development of IOT based energy monitoring and control
6.	Measurement and analysis of electrical parameters for Photovoltaic Solar Panel

PART B – Internet of Things (30 Hours)

1.	Design a Single layer PCB layout designing
2.	Fabricate Single layer PCB printing
3.	Assembling, soldering and desoldering practice on single layer PCB
4.	Sensor and actuator interfacing with internet enabled microcontroller
5.	Sensor and actuator calibration
6.	Integration of microcontroller based system with Cloud platform

PART C – Web Technologies (30 Hours)

1.	Design a simple web page using basic HTML tags and CSS properties
2.	Design a responsive webpage using Bootstrap framework
3.	Design a webpage for signup and login validation form using Javascript and PHP
4.	Create a database connectivity using PHP, MySQL and host the website in the server.

REFERENCES/ MANUAL /SOFTWARE:

1.	Laboratory Manual
2.	Eric T.Freeman,Elisabeth Robson, "Head First JavaScript Programming A Brain-Friendly Guide", 1st Edition, O'Reilly , 2014.
3.	Eric T.Freeman,Elisabeth Robson, "Head First HTML and CSS",2nd Edition, O'Reilly , 2012
4.	Lynn Beighley,"Head First SQL",1st Edition, O'Reilly,2007.

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Design electrical wiring circuits for buildings based on their requirement	Applying(K3) Precision (S3)
CO2	Develop IoT based solutions and PCB for real world use cases.	Applying (K3), Precision (S3)
CO3	Design and host an interactive dynamic website.	Applying(K3), Precision (S3)

Mapping of COs with POs and PSOs

COs/POs /PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	3	2	3		1	3	2	2	2		
CO2	3	3	3	2	3		1	3	2	2	2		
CO3	3	2	1	1		3	3	2	2	3			

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

Signature of the Chairman
Board of Studies - EEE

24MNT12 - QUANTITATIVE APTITUDE - I
(Common to all Engineering and Technology branches)

Programme & Branch	All B.E/B.Tech Branches	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Basic Mathematical skills	1	MC	20	0	0	10	30	0

Preamble	To impart problem solving skills and enhance analytical skills.	
Unit – I	Number system and Equations:	6

Number systems: Classification of numbers – Rules of divisibility – BODMAS Rule – HCF and LCM – Decimal fractions –Simplification – Problems.
Equations: Solving equations with one variable – Solving simultaneous linear equations with two variables – Applications of simultaneous linear equations – Problems on ages – Simple problems.

Unit – II	Ratio, Proportion and Percentage:	6

Ratio and Proportion: Third, Fourth and mean proportional – Comparison of ratios – Compound ratio – Duplicate ratio – Sub duplicate ratio – Triplicate ratio – Sub triplicate ratio – Chain rule – Simple problems.
Percentages: Basic Concepts – Problems on percentages – Problems on population – Problems on depreciation.

Unit – III	Profit and Loss, Interest:	8

Profit and Loss: Basic concepts – Cost price – Selling price – Profit and Loss – Simple problems.
Simple and Compound interest: Concepts – Percentage of interest – Difference between simple interest and compound interest – Simple problems.

TEXT BOOK:

1.	Dr R.S.Agarwal, "Quantitative Aptitude for Competitive Examinations", Revised Edition, S.Chand and company limited, 2022.

REFERENCES/ MANUAL / SOFTWARE:

1.	Abhijit Guha,"Quantitative Aptitude for Competitive Examination", 7th Edition, McGraw Hill Education, India, 2020.
2.	https://www.indiabix.com/aptitude/questions-and-answers
3.	https://www.geeksforgeeks.org/aptitude-questions-and-answers

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Solve equations with one and two variables.	Applying (K3)
CO2	Solve ratio, proportion and percentage problems.	Applying (K3)
CO3	Solve profit and loss, simple interest and compound interest problems.	Applying (K3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	2											
CO2	2	2											
CO3	3	3											

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		30	70				100
CAT2		30	70				100
CAT3		30	70				100

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks & ESE – 100 marks)
*includes Term Work (TW) & Online / Certification course hours

Signature of the Chairman
Board of Studies - S A H

24EGT21 - ENGLISH FOR EFFECTIVE COMMUNICATION - II									
(Common to all Engineering and Technology branches)									
Programme & Branch	All B.E/B.Tech Branches	Sem	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	2	HS	45	0	0	45	90	3

Preamble	This course aims at up skilling the learners to listen, speak, read, and write as well as to facilitate the students in practicing the language skills to acquire verbal and communicative proficiency in professional and academic contexts.	
sUnit – I	Grammar, Verbal Aptitude, Listening, Speaking, Reading & Writing	9

Grammar: Simple, Compound, and Complex Sentences – **Verbal Aptitude:** Odd Words – Paired words – **Listening:** Listening to a Match Commentary and Filling in a Table – Listening to TED talks - **Speaking:** Apologizing – Talking about Manners and Etiquette – **Reading:** Scanning a Text, Power Point Presentations – The Best Way to Start a New Habit : An Excerpt from *Atomic Habits* **Writing:** Business Letters: Enquiry and Complaint

Unit – II	Grammar, Verbal Aptitude, Listening, Speaking, Reading & Writing	9

Grammar: Direct and Indirect Speech – **Verbal Aptitude:** Words often Confused – Verbal Analogy – **Listening:** Listening to a Lecture and Sorting Information – Career Related Conversation – **Speaking:** Group Discussion – Speaking about Career Choices and Professional Skills – **Reading:** Reading for Local and Global Comprehension – How to Find and Fix the Causes of Your Bad Habits: An Excerpt from *Atomic Habits* - **Writing:** Job Application: Cover Letter and Resume – Student Portfolio

Unit – III	Grammar, Verbal Aptitude, Listening, Speaking, Reading & Writing	9

Grammar: Active and Passive Voice – **Verbal Aptitude:** Error Spotting – Sentence Improvement – Abbreviations and Acronyms – **Listening:** Listening to Podcast Interviews and News/Motivational Speeches – **Speaking:** Presenting a Point of View – Giving Opinions about Podcast – **Reading:** Reading a Procedure – Cross Cultural Communication - How to Make Good Habits Inevitable and Bad Habits Impossible: An Excerpt from *Atomic Habits* – **Writing:** Types of Essays: Argumentative and Opinion based Essays

Unit – IV	Grammar, Verbal Aptitude, Listening, Speaking, Reading & Writing	9

Grammar: If/Conditional Clause – Modals Verbs – Conversational Devices - **Verbal Aptitude:** Sentence Correction – Sentence Selection – **Listening:** Listening and Filling a Mind Map – Listening to Interviews, Celebrity talks – **Speaking:** Giving Advice and Suggestions – Interviewing Classmates - **Reading:** Reading for Information, Researching for Supporting Evidence – Technical Communication: Modes of Technology-based Communication – How to Stick with Good Habits Every Day : An Excerpt from *Atomic Habits* **Writing:** Dialogue Writing – Writing Reviews: Product and Documentary films/Web Series

Unit – V	Grammar, Verbal Aptitude, Listening, Speaking, Reading & Writing	9

Grammar: Common Errors in Tenses – Verb - Preposition combinations – **Verbal Aptitude:** Coding and Decoding – **Listening:** Listening for key points – Speeches of New Inventions – **Speaking:** Asking for and Giving Permission – Talking about Gadgets, Inventions and Technology – **Reading:** Categorizing Information – Technical Communication: Effective use of Technology-based Communication – The Goldilocks Rule: How to Stay Motivated in Life and Work: An Excerpt from *Atomic Habits* – **Writing:** Report Writing: IV Report and Case Study Report

TEXT BOOK:	
1.	Sudharshana N P and Savitha C, *English for Technical Communication*, 2nd Edition, Cambridge University Press, New Delhi, 2016.

REFERENCES:	
1.	Ashraf Rizvi. Effective Technical Communication, 2nd Edition, McGraw-Hill India, 2017.
2.	S. P. Dhanavel. English and Communication Skills for Students of Science and Engineering, Orient Black Swan Publishers, Hyderabad, 2009.
3.	James Clear. Atomic Habits By James Clear. Dharman, 2023.

* includes Term Work (TW) & Assignments, Tutorials and Case Studies

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	construct contextual and functional grammar to enhance the linguistic competence	Applying (K3)
CO2	listen, comprehend and infer implied meanings of the given text	Applying (K3)
CO3	speak clearly to develop competence to participate in oral discourses such as discussions / meetings / interviews and deliver presentations	Creating (K6)
CO4	critically read various texts by understanding contextual meanings and respond appropriately	Understanding (K2)
CO5	Analyze different genres of writing and making precise non-technical and technical documents	Analyzing (K4)

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1						1		1	3	1	1		
CO2								2	3		1		
CO3								2	3	1	2		
CO4						1			3	1	2		
CO5									3		2		

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN – THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1	-	30	70	-	-	-	100
CAT2	-	30	35	-	-	35	100
CAT3	-	20	45	35	-	-	100
ESE	-	20	55	10	-	15	100

* ±3% may be varied (CAT 1, 2& 3 – 50 marks & ESE – 100 marks)

Signature of the Chairman
Board of Studies - S &H (English)

24MAC21 - MULTIVARIABLE CALCULUS AND COMPLEX ANALYSIS
(Common to CIVIL, MECH, MTS, ECE, EEE, EIE & FT branches)

Programme & Branch	B.E – CIVIL, MECH,MTS, ECE,EEE,EIE & B.Tech - FT	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	2	BS	45	7	16	52	120	4

Preamble	To impart the knowledge of partial derivatives, evaluation of real and complex integrals, vector calculus and analytic functions to the students for solving the problems related to various engineering disciplines.

Unit – I	Functions of Several Variables:	9

Functions of two or more variables – Partial derivatives – Total differential – Applications: Maxima and minima – Constrained maxima and minima – Lagrange's multiplier method.

Unit – II	Multiple Integrals:	9

Double integration in cartesian coordinates – Change of order of integration – Application: Area between two curves – Triple integration in cartesian coordinates – Volume as triple integrals.

Unit – III	Vector Calculus:	9

Directional derivative – Gradient of a scalar point function – Divergence of a vector point function – Curl of a vector – Solenoidal and Irrotational vectors – Vector Integration: Introduction – Green's and Gauss divergence theorems (without proof) – Verification of the above theorems and evaluation of integrals using them.

Unit – IV	Analytic Functions:	9

Functions of a complex variable – Analytic functions – Necessary and sufficient conditions (excluding proof) – Cauchy–Riemann equations (Statement only) – Properties of analytic function (Statement only) – Harmonic function – Construction of analytic function – Conformal mapping: $w = z + a, az, 1/z$ – Bilinear transformation.

Unit – V	Complex Integration:	9

Introduction – Cauchy's theorem (without proof) – Cauchy's integral formula – Singularities – Classification – Cauchy's residue theorem (without proof) – Applications: Evaluation of definite integrals involving sine and cosine functions over the circular contour.

LIST OF EXPERIMENTS / EXERCISES:

1.	Finding ordinary and partial derivatives
2.	Computing extreme values of function of two variables
3.	Evaluating double and triple integrals
4.	Finding the area between two curves
5.	Computing gradient, divergence and curl of point functions
6.	Applying Milne-Thomson method for constructing analytic function
7.	Determination of Mobius transformation for the given set of points
8.	Finding poles and residues of an analytic function

TEXT BOOK:

1.	Kandasamy P., Thilagavathy K. and Gunavathy K., "Engineering Mathematics For First Year B.E/B.Tech", Reprint Edition 2016, S.Chand and Co., New Delhi.

REFERENCES/ MANUAL / SOFTWARE:

1.	Kreyszig E, "Advanced Engineering Mathematics ", 10th Edition, John Wiley, New Delhi, India, 2016.
2.	Ramana B V, "Higher Engineering Mathematics", 1st Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2018.
3.	Duraisamy C., Vengataasalam S., Arun Prakash K. and Suresh M., "Engineering Mathematics - II", 2nd Edition, Pearson India Education, New Delhi, 2018.
4.	Grewal B.S, "Higher Engineering Mathematics" 44thEdition, Khanna Publishers, New Delhi, 2018.
5.	Multivariable Calculus and Complex Analysis Laboratory Manual.

*includes Term Work (TW) & Online / Certification course hours

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Compute the total derivatives and extreme values of multivariable functions.	Applying (K3) Manipulation (S2)
CO2	Apply multiple integrals to compute the area and volume of the regions.	Applying (K3) Manipulation (S2)
CO3	Apply the concepts of derivatives and line integrals of point functions in engineering problems.	Applying (K3) Manipulation (S2)
CO4	Construct analytic functions and bilinear transformations and determine the image of given region under the given conformal mapping.	Understanding (K2) Manipulation (S2)
CO5	Apply the techniques of complex integration to evaluate real and complex integrals over closed curves.	Applying (K3) Manipulation (S2)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2		3								
CO2	3	3	2		3								
CO3	3	3			3								
CO4	3	3			3								
CO5	3	3	3		3								

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		40	60				100
CAT2		40	60				100
CAT3		50	50				100
ESE		30	70				100

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks & ESE – 100 marks)

Signature of the Chairman of Studies - s A H

24PHT23- PHYSICS FOR ELECTRONICS ENGINEERING

(Common to ECE, EEE and EIE branches)

Programme& Branch	BE - ECE, EEE and EIE branches	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	2	BS	45	0	0	45	90	3

Preamble	This course aims to impart the knowledge on crystal physics, quantum physics, conductors, superconductors, semiconductors and dielectric materials. It also describes the applications of aforementioned topics in electronics engineering.

Unit – I	Crystal Physics:	9

Classification of solids – Space lattice – Unit cell – Crystal structure – Bravais lattice – Single and polycrystalline materials – Lattice planes – Miller indices – Interplanar spacing in cubic crystal – Number of atoms per unit cell – Atomic radius – Coordination number – Atomic packing factor – Body centered cubic– Face centered cubic – Hexagonal close packed crystal structure – Crystal imperfections: line, surface and volume imperfections.

Unit – II	Quantum Physics and Applications:	9

Blackbody radiation – Planck's theory – Compton scattering – Matter waves – Properties – Heisenberg uncertainty principle – Schrodinger's time-independent and time-dependent wave equations – Physical significance of wave function – Particle in a one-dimensional box.

Unit – III	Conducting and Superconducting Materials:	9

Classical free electron theory of metals – Electrical conductivity – Merits and demerits of classical free electron theory – Quantum free electron theory (qualitative) – Fermi distribution function – Effect of temperature on Fermi function – Superconductivity – Temperature dependence of resistivity – Critical field – Meissner effect – Critical current – Isotope effect – Type-I superconductors and Type-II superconductors – Cryotron.

Unit – IV	Semiconducting Materials:	9

Intrinsic semiconductor – Carrier concentration – Fermi level – Variation of conductivity with temperature – Determination of band gap – Extrinsic semiconductors – Carrier concentration in n-type and p-type semiconductors – Hall effect – Determination of Hall coefficient – Applications – Solar Cell: Principle, construction and working.

Unit – V	Dielectric Materials:	9

Dielectrics – Dielectric constant – Polarization – Displacement vector – Electric susceptibility – Types of polarization mechanisms: Electronic, ionic, orientational and space-charge – Frequency and temperature dependence – Internal field – Clausius-Mosotti relation – Dielectric loss – Dielectric breakdown – Uses of dielectric materials in capacitors.

TEXT BOOK:

1.	Katiyar A.K, Pandey C.K, "Engineering Physics: Theory and Practical", 2nd edition, Wiley, 2015 (Unit I, II).
2.	Tamilarasan K and Prabu K, "Physics for Engineering I", 1st Edition, McGraw Hill Education Pvt. Ltd., New Delhi, 2023 (Unit III, IV, V).

REFERENCES:

1.	Malik H.K and Singh A.K, "Engineering Physics", 2nd Edition McGraw-Hill Education, New Delhi, 2022.
2.	Avadhanulu M.N, Kshirsagar P.G and Arun Murthy T.V.S, "A Textbook of Engineering Physics", 11th edition, S Chand, 2021.

*includes Term Work (TW) & Online / Certification course hours

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	analyze seven crystal systems, interplanar spacing in cubic lattice, BCC, FCC, HCP crystal systems and the types of crystal imperfections and their impacts.	Analyzing (K4)
CO2	investigate the concepts of quantum mechanics to describe Planck's theory, Compton effect and the behavior of electrons in a metal by solving Schrodinger's wave equations.	Analyzing (K4)
CO3	examine the concepts of classical and quantum free electron theories of metals to compute the electrical conductivity and to comprehend the effect of temperature on Fermi function for conducting materials and also to apply the concept of Cooper pair to comprehend the properties, types and application of superconductors.	Analyzing (K4)
CO4	Inspect the concept of density of states to compute the carrier concentration, electrical conductivity and band gap of intrinsic semiconductors and to compute the carrier concentration of extrinsic semiconductors, and also to explain the phenomenon related to Hall Effect and the working of solar cells.	Analyzing (K4)
CO5	explore the concept of electric dipole moment and electric polarization to comprehend the different polarization mechanisms in dielectrics, Clausius-Mosotti relation, dielectric loss, dielectric breakdown and to describe its uses in capacitors.	Analyzing (K4)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	2					1	1		1		
CO2	3	2	2					1	1		1		
CO3	3	2	2					1	1		1		
CO4	3	2	2					1	1		1		
CO5	3	2	2					1	1		1		

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		40	50	10			100
CAT2		40	50	10			100
CAT3		40	50	10			100
ESE		40	50	10			100

* ±3% may be varied (CAT 1,2,3 – 50 marks & ESE – 100 marks)

Signature of the Chairman
Board of Studies - S &H, Physics

24MET11 – ENGINEERING DRAWING
(Common to Civil, Mech, MTS, Auto, Chem, ECE, EEE, EIE, FT branches)

Programme & Branch	BE / BTech – Civil, Mech, MTS, Auto, Chem, ECE, EEE, EIE, FT branches	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	1 / 2#	ES	30	15	0	45	90	3

Preamble	To impart knowledge on engineering curves, orthographic projections, sectional views, development of surfaces, isometric projections and AutoCAD through free hand sketching and drawing instruments.

Unit – I	Introduction to Engineering drawing and Engineering Curves	6+3

Use of drafting instruments - BIS conventions and specifications - Size, layout and folding of drawing sheets - Lettering and dimensioning. Projection of pointsin different quadrants. Engineering Curves: Conic section- Ellipse, Parabola, Hyperbola (Eccentricity method). Cycloidal Curves- Cycloids and Involutes of circle and Hexagon.

Unit – II	Projection of planes and Solids	6+3

Projection of polygonal surface and circular lamina inclined to both reference planes. Projections of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

Unit – III	Sectioning of Solids and Development of Surfaces	6+3

Sectioning of prisms, pyramids, cylinder and cone in simple vertical position by cutting planes inclined to HP and perpendicular to VP - Obtaining true shape of section. Development of Lateral Surfaces of Simple and truncated Solids Like Prisms, Pyramids, Cylinders and Cones(Cutting planes inclined to HP and perpendicular to VP only).

Unit – IV	Isometric Projection	6+3

Principles of isometric projection - Isometric scale - Isometric projections of simple and truncated solids like prisms, pyramids and cylinders. Conversion of orthographic in to isometric views

Unit – V	Orthographic Projection and Introduction to AutoCAD	6+3

Conversion of isometric projection into orthographic projection (Freehand sketching only).
Introduction to Computer Aided Drawing: Role of CAD in design and development of new products. Creating two-dimensional drawing with dimensions using suitable software (Minimum 2 exercises mandatory). Introduction to Solid Modelling: Creating 3D models of various components using suitable modelling software. (Minimum 2 exercises mandatory).

TEXT BOOK:	
1.	Basant Agrawal, Agrawal C.M., "Engineering Drawing", 3rd Edition, McGraw Hill Education, 2019.

REFERENCES:	
1.	Lakh winder pal singh, Harwinder Singh., "Engineering Drawing and Principles and Applications", 1st Edition, Cambridge Ubiversity Press, 2021

*includes Term Work(TW) & Online / Certification course hours

#sem1: Cvil, Mech, MTS, Auto, Chem branches & sem 2: ECE, EEE, EIE, FT branches

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	interpret international standards of drawings and sketch the engineering curves	Applying (K3)
CO2	draw the projection of planes and solids	Applying (K3)
CO3	draw sectioning and developing of 3D primitive objects like prisms, pyramids, cylinders, cones	Applying (K3)
CO4	sketch the isometric projections of simple and truncated solids and convert orthographic projection in to isometric drawing	Applying (K3)
CO5	obtain multi view projections and solid models of objects using CAD tools	Applying (K3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	1			2					3			
CO2	3	1	1		2					3			
CO3	3	1	1		2					3			
CO4	3	1	1		2					3			
CO5	3	1	1		2					3			

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1	-	-	100	-	-	-	100
CAT2	-	-	100	-	-	-	100
CAT3	-	-	100	-	-	-	100
ESE	-	-	100	-	-	-	100

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks & ESE – 100 marks)

Signature of the Chairman
.. d of Studies - Mechanical

24CSC23– DATA STRUCTURES USING C									
Common to ECE, EEE, E & I Branches									
Programme & Branch	Common to ECE, EEE, E & I Branches	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Programming in C	2	ES	45	0	30	45	120	4

Preamble	This course is indented to introduce the concept of elementary data structures and notion of algorithms to novice learner from cross disciplines in Engineering and Technology.

Unit – I	List:	9
Data Structures - Abstract Data Types (ADT) - List ADT and Array Implementation - Linked List - Doubly Linked List - Application: Polynomial Addition		

Unit – II	Stack and Queues:	9
Stack ADT – Array and Linked List implementation of Stacks - Application: Infix to Postfix Conversion - Postfix Expression Evaluation - Queue ADT – Array and Linked List implementation of Queues - Applications		

Unit – III	Trees:	9
Trees-Preliminaries – Binary Trees –Binary Tree Traversals - The Search Tree ADT – Binary Search Trees–Priority Queues (Binary Heap)- Application: Expression Tree		

Unit – IV	Graphs:	9
Graphs – Definitions – Elementary Graph Operations- Traversals – Shortest-Path Algorithms: Dijkstra"s Algorithm – Minimum Spanning Tree: Prim"s Algorithm- Kruskal"s Algorithm		

Unit – V	Sorting and Hashing:	9
Sorting - Preliminaries – Insertion Sort – Quicksort – Merge sort – Hashing – General Idea – Hash Function – Separate Chaining – Open addressing.		

LIST OF EXPERIMENTS / EXERCISES:	
1.	Implementation of C programs using pointers
2.	implementation of singly linked list and its operations
3.	Implementation of doubly linked list and its operations
4.	Implementation of Stack and its operations
5.	Implementation of Queue and its operations
6.	Implementation of Stack and Queue using Singly Linked List
7.	Convert a given In-fix Expression into Post-fix Expression using Stack ADT
8.	Implementation of Binary Search Tree traversals
9.	Implementation of Graph traversals
10.	Implementation of sorting algorithms: Insertion and Merge sort

TEXT BOOK:	
1.	Weiss M. A., "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education Asia, New Delhi, 2016.

REFERENCES/ MANUAL / SOFTWARE:	
1.	Horowitz Sahni, Andreson Freed, "Fundamentals of Data Structures in C", 2nd Edition, Universities Press, Hyderabad, 2011.
2.	Langsam Y.M., Augenstein J. and Tenenbaum A. M., "Data Structures using C and C++", 2nd Edition, Pearson Education, 2015.

*includes Term Work(TW) & Online / Certification course hours

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	apply List ADT for solving the given problems	Applying (K3) Precision (S3)
CO2	make use of arrays and linked lists to create Stack and Queue ADTs.	Applying (K3) Precision (S3)
CO3	utilize Tree ADT to develop simple application	Applying (K3) Precision (S3)
CO4	make use of Graph ADT for standard problems	Applying (K3) Precision (S3)
CO5	illustrate the use of standard sorting and Hashing Techniques	Applying (K3) Precision (S3)

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	1	1						1	1		
CO2	3	2	1	1						1	1		
CO3	3	2	1	1						1	1		
CO4	3	2	1	1						1	1		
CO5	3	2	1	1						1	1		

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applyin g (K3) %	Analyzi ng (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		45	55				100
CAT2		35	65				100
ESE		35	65				100

* ±3% may be varied (CAT 1 ,2 &3 – 50 marks & ESE – 100 marks)

Signature of the Chairman
Board of Studies - CSE

[S. RAMYA]
21/7/25

24TAM02 - TAMILS AND TECHNOLOGY									
(Common to All Engineering and Technology Branches)									
Programme & Branch	All BE/BTech Branches	Sem.	Category	L	T	P	SL*	TOT	Credit
Prerequisites	Nil	2	HS	15	0	0	15	30	1

Preamble	This course aims to impart the essential knowledge on the tamil culture and related technology	
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.		

TEXT BOOK:

1.	Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)
2.	Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).

REFERENCES:

1.	தமிழக வரலாறு - மக்களும் பண்பாடும் - கே கே பிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்), உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை, 2002
2.	கணினித்தமிழ் முனைவர் இல. சுந்தரம், விகடன் பிரசுரம், 2016
3.	கீழடி வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்.(தொல்லியல் துறை வெளியீடு)
4.	பொருநை ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு
5.	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukarasu) (Published by : International Institute of Tamil Studies)
6.	The Contribution of the Tamils to Indian Culture (Dr.M.Valarmathi)(Puplished by International Institute of Tamil Studies).
7.	Keeladi – 'Sangam City Civilzation on the banks of river Vaigai; (Jointly Published by: Department of Archaeology & Tamilnadu Text Book and Educational Services Corporation, Tamilnadu)
8.	Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by : The Author)
9.	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu)
10.	Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

*includes Term Work (TW) & Online / Certification course hours

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	explain weaving and ceramic technology in tamil culture and tamil society.	Understanding (K2)
CO2	Illustrate about the design and construction technology.	Understanding (K2)
CO3	summarize about the manufacturing technology.	Understanding (K2)
CO4	explain the agriculture and irrigation technology.	Understanding (K2)
CO5	explain the significance of tamil in scientific and computing.	Understanding (K2)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1						3		3	2	2			
CO2						3		3	2	2			
CO3						3		3	2	2			
CO4						3		3	2	2			
CO5						3		3	2	2			

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN – THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1	40	60					100
CAT2	40	60					100
CAT3	40	60					100
ESE	NA						

* ±3% may be varied (CAT 1,2,3 – 50 marks)

Signature of the Chairman
Board of Studies - S &H (Physics)

24TAM02 - தமிழரும் தொழில்நுட்பமும்										
(Common to All Engineering and Technology Branches)										
Programme & Branch	All BE/BTech Branches	Sem.	Category	L	T	P	SL*	TOT	Credit
Prerequisites	Nil	2	HS	15	0	0	15	30	1

முன்னுரை	தமிழ் கலாச்சாரத்தோடு ஒன்றிய தொழில் நுட்பங்களை பற்றிப் எடுத்துரைத்தல்	

அலகு - I	நெசவு மற்றும் பானை தொழில்நுட்பம்	3

சங்க காலத்தில் நெசவு தொழில் – பானைத் தொழில்நுட்பம் கருப்பு சிவப்பு பாண்டங்கள் – பாண்டகளில் கீறல் குறியீடுகள்

அலகு - II	வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்	3

சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப்பொருட்களில் வடிவமைப்பு – சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் – சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் – மாமல்லபுரச்சிற்பங்களும், கோவில்களும் – சோழர் காலத்து பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் – நாயக்கர் காலக் கோயில்கள் –மாதிரிகட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் – செட்டிநாட்டு வீடுகள் – பிரிட்டிஷ் காலத்தில் சென்னை இந்தோ-சாரோசெனிக் கட்டிடக் கலை.

அலகு - III	உற்பத்தித் தொழில்நுட்பம்	3

கப்பல் கட்டும் கலை – உலோகவியல் – இரும்புத் தொழிற்சாலை – இரும்பை உருக்குதல், எஃகு – வரலாற்றுச்சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் – நாணயங்கள் அச்சடித்தல் – மணி உருவாக்கும் தொழிற்சாலைகள் – கல்மணிகள் – கண்ணாடி மணிகள் – சுடுமண் மணிகள் – சங்கு மணிகள் – எலும்புத்துண்டுகள் – தொல்லியல் சான்றுகள் – சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

அலகு - IV	வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில்நுட்பம்	3

அணை, ஏரி, குளங்கள், மதகு – சோழர்கால குமிழித் தூம்பின் முக்கியத்துவம் – கால்நடை பராமரிப்பு – கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் – வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள் – கடல்சார் அறிவு – மீன்வளம் – முத்து மற்றும் முத்துக்குளித்தல் – பெருங்கடல் குறித்த பண்டைய அறிவு – அறிவுசார் சமூகம்.

அலகு - V	அறிவியல் தமிழ் மற்றும் கணினித்தமிழ்	3

அறிவியல் தமிழின் வளர்ச்சி – கணினித்தமிழ் வளர்ச்சி – தமிழ் நூல்களை மின்பதிப்பு செய்தல் – தமிழ் மென்பொருட்கள் உருவாக்கம் – தமிழ் இணையக் கல்விக்கழகம் – தமிழ் மின் நூலகம் – இணையத்தில் தமிழ் அகராதிகள் சொற்குவைத் திட்டம்.

TEXT BOOK:

1.	தமிழக வரலாறு - மக்களும் பண்பாடும் - கே கே பிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்), உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை, 2002
2.	கணினித்தமிழ் முனைவர் இல. சுந்தரம், விகடன் பிரசுரம், 2016

REFERENCES:

1.	கீழடி-வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்.(தொல்லியல் துறை வெளியீடு)
2.	பொருநை-ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)
3.	Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)
4.	Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).
5.	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukarasu) (Published by : International Institute of Tamil Studies)
6.	The Contribution of the Tamil to Indian Culture (Dr.M.Valarmathi) (Puplished by International Institute of Tamil Studies).
7.	Keeladi – 'Sangam City Civilzation on the banks of river Vaigai; (Jointly Published by: Department of Archaeology & Tamilnadu Text Book and Educational Services Corporation, Tamilnadu)
8.	Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by: The Author)
9.	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu)
10.	Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

*includes Term Work (TW) & Online / Certification course hours

COURSE OUTCOMES: படிப்பை முடித்தவுடன், மாணவர்கள்		BT Mapped (Highest Level)
CO1	தமிழ் கலாச்சாரம் மற்றும் தமிழ் சமூகத்தினுடைய நெசவு மற்றும் பானை தொழில்நுட்பம் பற்றி விளக்க முடியும்.	Understanding (K2)
CO2	தமிழர்களின் வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்ப ஆற்றல் பற்றி விளக்க முடியும்.	Understanding (K2)
CO3	தமிழர்களின் உற்பத்தித் தொழில்நுட்பம் பற்றி சுருக்கமாகக் கூற முடியும்.	Understanding (K2)
CO4	தமிழர்களின் வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில்நுட்பம் பற்றி விளக்க முடியும்.	Understanding (K2)
CO5	தமிழர்களின் அறிவியல் தமிழ் மற்றும் கணினித்தமிழ் பற்றி விளக்க முடியும்.	Understanding (K2)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1						3		3	2	2			
CO2						3		3	2	2			
CO3						3		3	2	2			
CO4						3		3	2	2			
CO5						3		3	2	2			

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN – THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1	40	60					100
CAT2	40	60					100
CAT3	40	60					100
ESE	NA						

* ±3% may be varied (CAT 1,2,3 – 50 marks)

Signature of the Chairman
Board of Studies - S & H (Physics)

ACADEMIC CELL
KONGU ENGINEERING COLLEGE

24PHL23 - PHYSICS LABORATORY FOR ELECTRONICS ENGINEERING
(Common to ECE, EEE and EIE branches)

Programme& Branch	BE - ECE, EEE and EIE branches	Sem.	Category	L	T	P	SL*	TOT	Credit
Prerequisites	Nil	2	BS	0	0	30	0	30	1

Preamble	This course aims to impart hands on training in the determination of the physical parameters such as wavelength of laser, particle size, acceptance angle and numerical aperture of an optical fiber, AC frequency, specific resistance, band gap, thickness of a thin film and knowledge on the working of p-n diode and UJT and also to impart skills on writing coding / developing project / product related to societal requirement.

LIST OF EXPERIMENTS / EXERCISES:

1.	Determination of the wavelength of the given semiconductor laser.
2.	Determination of the particle size of the given powder using laser.
3.	Determination of the acceptance angle and numerical aperture of the given optical fiber.
4.	Observation of the I-V characteristics of a p-n junction diode.
5.	Observation of the I-V characteristics of a uni junction transistor.
6.	Determination of the frequency of alternating current using electrically vibrating tuning fork (Melde's apparatus).
7.	Determination of the specific resistance of the given metallic wire using Carey Foster's bridge.
8.	Determination of the band gap of a given semiconducting material using post-office box.
9.	Determination of the thickness of a thin film using air-wedge arrangement.
10.	Writing coding for any one of the above experiments / developing a project / a product.

REFERENCES/ MANUAL /SOFTWARE:

1.	Physics Laboratory Manual / Record, Department of Physics, 1st Edition, 2024.

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	determine the wavelength of a semiconductor laser, the particle size of a powder material, and the acceptance angle and numerical aperture of an optical fiber.	Analyzing (K4), Precision (S3)
CO2	determine the I-V characteristics of a p-n diode, the I-V characteristics of a UJT and the frequency of an alternating current.	Analyzing (K4), Precision (S3)
CO3	determine the specific resistance of a metallic wire, the band gap of semiconducting material, the thickness of a thin film and develop a coding / project / product.	Analyzing (K4), Precision (S3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	2	3				3	1		2		
CO2	3	2	2	3				3	1		2		
CO3	3	2	2	3				3	1		2		

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

*includes Term Work (TW) & Online / Certification course hours

Signature of the Chairman
Board of Studies - S & H (Physics)

24GCL11 – FOUNDATION LABORATORY - MANUFACTURING, DESIGN AND ROBOTICS
(Common to all BE/BTech branches)

Programme & Branch	All BE/BTech Branches	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	1/2	ES	0	0	90	0	90	3
Preamble	This course provides the hands-on experience to develop a prototype model with the basic knowledge of Computer-aided Design, Manufacturing Processes, 3D Printing Technology, Robotics and Embedded Control.								

LIST OF EXPERIMENTS / EXERCISES:

PART A – Manufacturing Laboratory (30 Hours)

1. Selection of product, free hand sketching and detailing
2. Construction of model using Arc/TIG/MIG/Gas/Spot welding operations
3. Enhancing the model with sheet metal
4. Creating the parts of the model using lathe
5. Creating the parts of the model using milling and drilling machines

PART B – Product Design and Development Laboratory (30 Hours)

1. Free hand sketching and detailing of the component
2. 3D part modelling of the component using CAD software
3. Engineering Analysis of the component model
4. Generate the component using 3D printer

PART C – Robotics Laboratory (30 Hours)

1. Design of electronic circuit and its debugging
2. Assembly and interfacing of sensors, actuators and wireless communion modules with audrino UNO
3. Development of embedded programming and interfacing for motion control and obstacle avoidance
4. Demonstration and testing of robot in static environment

REFERENCES/ MANUAL /SOFTWARE:

1. Foundation Engineering Laboratory Manual
2. SOLID WORKS 2022 Software

COURSE OUTCOMES:
On completion of the course, the students will be able to

		BT Mapped (Highest Level)
CO1	develop the prototype model using mechanical operations like welding, forming and machining processes	Applying (K3), Precision (S3)
CO2	sketch 3D model and develop the prototype using 3D printer	Applying (K3), Precision (S3)
CO3	design and develop the autonomous robot for real-time applications	Applying (K3), Precision (S3)

Mapping of COs with POs and PSOs

COs/POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	3	2				3	2		2		
CO2	3	3	3	3				3	2		2		
CO3	3	3	3	2				3	2		2		

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

Signature of the Chairman
Board of Studies - Mechanical

24MNT21 - QUANTITATIVE APTITUDE - II									
(Common to all Engineering and Technology branches)									
Programme & Branch	All B.E/B.Tech Branches	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Basic Mathematical skills	2	MC	20	0	0	10	30	0

Preamble	To impart problem solving skills and enhance analytical skills.

Unit – I	Averages, Alligations, Time and Work:	6

Averages, Alligations or Mixtures: Concepts – Definition – Formula – Simple problems on averages – Alligation or Mixture rule – Applications – Problems.
Time and Work: Concepts – Work and wages – Pipes and Cisterns – Simple problems.

Unit – II	Time and Distance:	6

Time and Distance: Time, speed and distance – Conversions – Average speed – Relative speed – Problems on boats and streams – Upstream and downstream – Simple problems.

Unit – III	Permutation and Combination, Probability:	8

Permutation and Combination: Concepts – Simple problems.
Probability: Basic Concepts – Applications – Simple problems.

TEXT BOOK:

1.	Dr.R.S.Agarwal, "Quantitative Aptitude for Competitive Examinations", Revised Edition, S.Chand and company limited, 2022.

REFERENCES/ MANUAL / SOFTWARE:

1.	Abhijit Guha,"Quantitative Aptitude for Competitive Examination", 7th Edition, McGraw Hill Education, India, 2020.
2.	https://www.indiabix.com/aptitude/questions-and-answers
3.	https://www.geeksforgeeks.org/aptitude-questions-and-answers

COURSE OUTCOMES:
On completion of the course, the students will be able to

		BT Mapped (Highest Level)
CO1	Solve averages, alligations or mixtures, time and work problems.	Applying (K3)
CO2	Solve the problems on time and distance, upstream and downstream oriented applications problems.	Applying (K3)
CO3	Solve problems involving permutation, combination and probability concepts.	Applying (K3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	2											
CO2	2	3											
CO3	3	2											

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		30	70				100
CAT2		30	70				100
CAT3		30	70				100

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks & ESE – 100 marks)

*includes Term Work (TW) & Online / Certification course hour

Signature of the Chairman
Board of Studies - S 4 H

24MAT33 – PROBABILITY AND RANDOM PROCESS

Programme & Branch	BE & Electronics and Communication Engineering	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	3	BS	45	15	0	60	120	4

Preamble	To impart knowledge in random variables, probability distributions, correlation and apply the concepts of random process and spectral densities in communication engineering	
Unit – I	**Random Variables:**	**9+3**
Discrete and Continuous random variables – Probability Mass and Probability density functions – Mathematical expectation and Variance – Moments – Moment generating function.		
Unit – II	**Standard Probability Distributions:**	**9+3**
Discrete Distributions: Binomial distribution – Poisson distribution – Geometric distribution – Continuous Distributions: Uniform distribution – Exponential distribution – Normal distribution.		
Unit – III	**Two Dimensional Random Variables:**	**9+3**
Introduction – Joint probability distributions – Marginal and conditional distributions – Covariance – Correlation and regression.		
Unit – IV	**Random Process:**	**9+3**
Introduction – Classification – Stationary process – Markov chains – Transition probabilities – Limiting distributions – Poisson process.		
Unit – V	**Correlation and Spectral densities:**	**9+3**
Auto Correlation – Cross Correlation – Properties – Power spectral density – Cross spectral density – Properties – Wiener- Khintchine relation – Relationship between cross power spectrum and cross correlation function.		

TEXT BOOK:

1.	Veerarajan, T, "Probability and Statistics, Random Processes and Queuing Theory", 1st Edition, McGraw Hill Education, Chennai, 2019.

REFERENCES:

1.	Jay L. Devore., "Probability and Statistics for Engineering and the Sciences", 9th Edition, Cengage Learning, USA, 2016.
2.	Roy.D.Yates and David.J.Goodman, "Probability and Stochastic Processes - A friendly Introduction for Electrical and Computer Engineers", 3rd Edition, John Wiley & Sons, USA, 2014.
3.	H. Stark and J. W. Woods, "Probability and Random Processes with Applications to Signal Processing", 3rd Edition, Pearson, USA, 2002.
4.	Trivedi, K.S., "Probability and Statistics with Reliability, Queueing and Computer Science Applications", 2nd Edition, John Wiley and Sons, 2002.

*includes Term Work (TW) & Online / Certification course hours

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Interpret the concept of random variables.	Applying (K3)
CO2	Apply the standard probability distributions in real time situations.	Applying (K3)
CO3	Apply the concepts of two dimensional random variables and regression in engineering problems.	Applying (K3)
CO4	Understand the concepts of Random Process and determine the temporal characteristics of random signals.	Applying (K3)
CO5	Apply the concepts of spectral densities and correlation functions to solve complex engineering problems.	Applying (K3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	1										
CO2	3	2	2										
CO3	3	3	2										
CO4	3	2	1	2									
CO5	3	3	3	2									

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		30	70				100
CAT2		30	70				100
CAT3		30	70				100
ESE		30	70				100

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks & ESE – 100 marks)
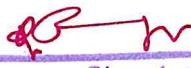
Signature of the Chairman
Board of Studies - S 4 H

24ITC33 – PROGRAMMING IN PYTHON							
(Common to ECE, EEE, EIE Engineering branches)							

Programme& Branch	ECE,EEE,EIE,MTS	Sem.	Category	L	T	P	MP	C
Prerequisites	Programming in C	3	ES	3	0	2	ES	4

Preamble	This course introduces the core Python programming. It emphasizes developing Python programs with all data types, functions, classes ,objects and NumPy

Unit – I	Introduction:	9

Problem-solving strategies–program design tools–Types of errors–Testing and Debugging-Basics: Literals–variables and identifiers–data types-input operation–comments–reserved words–indentation–Operators and Expressions–Decision Control Statements- Introduction–conditional statement–iterative statements–Nested Loops–break ,continue and pass statements—else in loops.

Unit – II	Lists, Tuples and Dictionary:	9

Lists: Access, update, nested, cloning, operations, methods, comprehensions, looping- Tuple:Create, utility, access, update,delete, operations, assignments, returning multiple values, nested tuples, index, and count method - Dictionary: Create, access, add and modify, delete, sort, looping, nested, built-in methods—list vs tuple vs dictionary.

Unit – III	Strings and Regular Expressions:	9

Strings: Concatenation, append, multiply on strings–Immutable–formatting operator–Built-in string methods and functions–slice operation–functions–operators–comparing –iterating –string module–Regular Expressions–match, search, sub, find all and find iterative functions–flag options.

Unit – IV	Functions and Modules:	9

Functions: Introduction-definition–call–variable scope and lifetime –return statement–function arguments–lambda function–documentation strings–programming practices recursive function-Modules: Modules–packages–standard library methods– function redefinition.

Unit – V	Object Orientation:	9

Class and Objects: Class and objects–class methods and self–constructor–class and object variables–destructor–public and private data member- **NumPy:** NumPy Arrays–Computation on NumPy Arrays .**Matplot Lib:** Line plots–Scatter Plots

LIST OF EXPERIMENTS / EXERCISES:	
1.	Programs using conditional and looping statements
2.	Implementation of list and tuple operations
3.	Implementation of dictionary operations
4.	Perform various string operations
5.	Use regular expressions for validating inputs
6.	Demonstration of different types of functions and parameter passing
7.	Develop programs using classes and objects
8.	Perform computation on NumPy arrays
9.	Draw different types of plots using Matplotlib

TEXT BOOK:	
1.	ReemaThareja.,"PythonProgrammingusingproblemsolvingapproach",3rd impression,OxfordUniversityPress.,NewDelhi,2017.

REFERENCES/ MANUAL / SOFTWARE:	
1.	NageswaraRao,"Core Python Programming", 2nd Edition, Dream Tech Press, NewDelhi,2018.
2.	JakeVanderPlas,"Python Data Science Hand book Essential Tools for Working with Data",O'Reillypublishers,1st Edition, 2016.

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	use basic Python constructs to build simple programs	Applying(K3), Precision(S3)
CO2	apply list, tuple, and dictionary to handle a variety of data.	Applying(K3), Precision(S3)
CO3	apply strings and regular expressions for searching and retrieval	Applying(K3), Precision(S3)
CO4	solve the problems using functions and modules.	Applying(K3), Precision(S3)
CO5	apply object-oriented concepts and perform basic data science operations using Python	Applying(K3), Precision(S3)

Mapping of COs with POs and PSOs

COs/POs /PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	2	2	3	1	2	3	3	2	2	3	2
CO2	3	2	2	2	3	1	2	3	3	2	2	3	2
CO3	3	2	2	2	3	1	2	3	3	2	2	3	2
CO4	3	2	2	2	3	1	2	3	3	2	2	3	2
CO5	3	2	2	2	3	1	2	3	3	2	2	3	2

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		25	75				100
CAT2		25	75				100
CAT3		25	75				100
ESE		25	75				100

* ±3% may be varied (CAT 1 ,2 & 3 – 50 marks & ESE – 100 marks)

Signature of the Chairman
Board of Studies - IT

	24ECT31 - DIGITAL ELECTRONICS								

Programme & Branch	B.E. & Electronics and Communication Engineering	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	3	PC	45	0	0	45	90	3

Preamble	To gain knowledge about the number systems and to design combinational and sequential logic circuits.

Unit – I	Binary Numbers and Minimization Techniques:	9

Review of number systems-Complements-Signed binary numbers- Boolean postulates and laws - De-Morgan's theorem - Principle of Duality- Boolean expression- Minimization of Boolean expressions- Minterm, Maxterm, Sum of Products (SOP), Product of Sums(POS)- Karnaugh map minimization -Implementations of logic functions using universal gates.

Unit – II	Combinational Circuits Design:	9

Design procedure – Half adder and subtractor – Full adder and subtractor -Parallel binary adder / subtractor – Carry look ahead adder -BCD adder- Multiplexer- Demultiplexer – Decoder - Encoder – Parity checker and generator – Code converters- Magnitude comparator.

Unit – III	Design and Analysis of Synchronous Sequential Circuits:	9

Latches and Flipflops: SR, JK, D and T Master/Slave FF, Level and Edge triggering - Design and analysis of synchronous sequential circuits: State diagram, State table, State minimization and State assignment.- Registers: Shift registers, Universal shift register - Design of synchronous counters-up counter, down counter, up-down counter, Ripple counters.

Unit – IV	Design and Analysis of Asynchronous Sequential Circuits:	9

Introduction to asynchronous circuits - State reduction and assignments - Design of Fundamental mode sequential circuits - Cycles – Races –Hazards: Static Dynamic, Essential and Design of Hazard free circuits.

Unit – V	Digital Logic Families and PLDs:	9

Introduction to Digital Logic families -Characteristics: Fan-out, Power dissipation, Propagation delay and Noise Margin – RTL and DTL circuits – Transistor-Transistor Logic: Open-Collector output, Totem-pole output, Three-state output - implementation of Inverter, NAND, NOR using CMOS logic, Realization of combinational logic circuits using PLDs: PROM, PLA and PAL.

TEXT BOOK:	
1.	Morris Mano M., "Digital Design", 4th Edition, Pearson Education Pvt. Ltd., New Delhi, 2006.

REFERENCES/ MANUAL / SOFTWARE:	
1.	Floyd T L, "Digital Fundamentals",11th Edition, Pearson Education, New Delhi, 2015.
2.	Salivahanan S. &Arivazhagan S., "Digital Circuits and Design", 5th Edition, Oxford University Press, New Delhi, 2018.

*Includes Term Work (TW) & Online / Certification course hours

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	apply Boolean laws and Karnaugh map for logic minimization	Applying (K3)
CO2	design combinational circuits	Applying (K3)
CO3	design synchronous sequential circuits	Applying (K3)
CO4	design asynchronous sequential circuits	Applying (K3)
CO5	design digital circuits using MOS and PLDs.	Applying (K3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3										3	
CO2	3	3	3			2		2	2			3	
CO3	3	3	3			2		2	2			3	
CO4	3	3	3			2		2	2			3	
CO5	3	3	3			2		2	2			3	

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		20	80				100
CAT2		20	80				100
CAT3		20	80				100
ESE		10	90				100

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks & ESE – 100 marks)

Signature of the Chairman
F   ~1 of Studies - ECE

24ECT32 – ELECTROMAGNETIC FIELDS

Programme & Branch	B.E & Electronics and Communication Engineering	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	3	PC	45	0	0	45	90	3

Preamble	To impart the knowledge on the behavior of electric field and magnetic field in static and time varying environment.

Unit – I	Unit Title: Static electric Fields	9

Introduction to Co-ordinate System – Rectangular – Cylindrical and Spherical Co-ordinate-Coulomb's Law in Vector Form – Definition of Electric Field Intensity- Calculation of electric field intensity due to different charge configurations: Point charge, line charge and surface charge-Electric Flux Density – Gauss Law – Proof of Gauss Law – Applications(Point and Line charge)-Electric Scalar Potential – Relationship between potential and electric field - Potential due to infinite uniformly charged line – Potential due to electrical dipole.

Unit – II	Unit Title: Conductors and Dielectrics	9

Electric current – Current density – point form of Ohm's law – continuity equation for current--Nature of dielectric materials -Boundary conditions for electric fields- Definition of Capacitance-Several Capacitance examples- Poisson's and Laplace's equation-Capacitance of parallel plate using Laplace's equation.

Unit – III	Unit Title: Static Magnetic Field and Magnetic Materials	9

Biot-Savart Law in vector form – Magnetic Field intensity due to a finite and infinite wire carrying a current I – Magnetic field intensity on the axis of a circular and rectangular loop carrying a current I – Ampere's circuital law and simple applications. Magnetic flux density- Magnetic Vector Potential– Magnetic moment-Nature of magnetic materials -Magnetic boundary conditions-Definition of Inductance – Inductance of loops and solenoids – Definition of mutual inductance – simple examples.

Unit – IV	Unit Title: Time Varying Fields and Electromagnetic Waves	9

Faraday's law –Displacement current –Maxwell's four equations in integral form and differential form- Maxwell's equation in Phasor form -Derivation of Wave Equation- Wave equation in Phasor form -Poynting Vector and the flow of power.

Unit – V	Unit Title: Uniform Plane Waves	9

Plane waves in lossless dielectric– Plane waves in lossy dielectrics – Propagation in good conductors - Reflection of Plane Wave– normal and oblique incidence-Polarization - Simulation to find parameters of uniform plane wave.

TEXT BOOK:	
1.	S Salivahanan, S Karthie, "Electromagnetic Filed Theory", 2nd Edition, McGraw-Hill Education, 2018.

REFERENCES:	
1.	William H. Hayt, Jr ,John A. Buck, and Jaleel M Akhtar, "Engineering Electromagnetics",9th Edition, McGraw Hill Publishing Company, NewDelhi,2020.
2.	Edward .C.Jordan. and Keith.G.Balmain "Electromagnetic Waves and Radiating Systems", 2nd Edition, Pearson Education, 2015.

*Includes Term Work (TW) & Online / Certification course hours

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	determine the electric field intensity and potential for static charge distributions.	Applying (K3)
CO2	apply boundary conditions and derive the capacitance of parallel plate capacitors	Applying (K3)
CO3	calculate the magnetic field intensity and flux density for current carrying conductor	Applying (K3)
CO4	apply Maxwell's equation and obtain the Wave parameters.	Applying (K3)
CO5	compute the characteristics of uniform plane waves in conductor, lossless and lossy dielectric media.	Applying (K3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2										2	
CO2	3	3										2	
CO3	3	3										2	
CO4	3	3	2									2	
CO5	3		3									3	

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		60	40				100
CAT2		60	40				100
CAT3		70	30				100
ESE		60	40				100

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks & ESE – 100 marks)

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Board of Studies - ECE

24ECT33 - ELECTRONIC DEVICES

Programme & Branch	B E & Electronics and Communication Engineering	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Physics for Electronics Engineering	3	PC	45	0	0	45	90	3

Preamble	To provide the fundamental knowledge for understanding the concepts of semiconductor devices and applications

Unit – I	Semiconductor and Carrier Transport	9

Semiconductor devices: building blocks, Major semiconductor devices - Carrier drift: mobility, resistivity - Carrier Diffusion: Diffusion process, Einstein equation, current density equation - Generation and Recombination: Direct, indirect, surface - Continuity Equation

Unit – II	PN DIODE and BJT:	9

Theory of PN junction diode: Depletion width with no voltage, Forward Bias, Reverse Bias- Diode ratings - Energy band structure of open circuited PN junction - Current equations - Diode resistance - Diode circuits: clipper and clampers
Bipolar Junction Transistors: Construction, Operation - CE, CB and CC Configuration: Characteristics and comparisons - Current amplification factor

Unit – III	FIELD EFFECT TRANSISTORS:	9

JFET: Construction, operation and characteristic parameters -Expression for Saturation Drain Current
MOSFET: Construction, operation -Enhancement MOSFET, Depletion MOSFET – Effect of channel length modulation – Threshold voltage – Temperature effects - Body effect - Introduction to MOSFET scaling

Unit – IV	SPECIAL SEMICONDUCTOR DEVICES:	9

Zener diode - Tunnel diode - PIN diode - LASER diode - Avalanche photodiode - Photo transistor- LCD - UJT - FinFET - MESFET - Thyristors - SCR, DIAC, TRIAC

Unit – V	Rectifier and Power Supply:	9

Linear mode power supply- Rectifiers: Half wave rectifier, full wave rectifier, Bridge rectifier - Filters: inductor, capacitor, LC filters - Voltage regulators: Zener diode shunt regulator - Switched Mode Power Supply

TEXT BOOK:

1.	S Salaivahanan, N Suresh Kumar," Electronic Devices and Circuits" ,5th edition, Mc Graw Hill Education, 2022 (Units-II,III,IV,V)
2.	S M Sze, M K Lee, "Semiconductor Devices Physics and Technology", 2nd edition, John Wiley & Sons, , 2012 (Unit-I)

REFERENCES:

1.	Adel S.Sedra, Kenneth C.Smith ," Microelectronic Circuits Theory and Application" Oxford University press India
2.	David Bell , "Electronic devices and circuits", Oxford University higher education, 5th edition 2008.

*Includes Term Work (TW) & Online / Certification course hours

Kongu Engineering College, Perundurai, Erode – 638060 India

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	understand the importance of carrier concentration and doping in semiconductors	Understanding (K2)
CO2	Know the characteristics of PN diode and BJT for various conditions	Applying (K3)
CO3	understand the principle of operation of semiconductor devices like JFET, MOSFET	Understanding (K2)
CO4	Understand the characteristics and use specialized semiconductor devices for various applications	Understanding (K2)
CO5	Apply the property of junction diode in rectifiers and regulators	Applying (K3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	2								1	2	1
CO2	3	2	2								1	2	1
CO3	3	2	2								1	2	1
CO4	3	2	2								1	2	1
CO5	3	3	2	3	3	2					2	3	1

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN - THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		80	20				100
CAT2		80	20				100
CAT3		70	30				100
ESE		70	30				100

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks & ESE – 100 marks)

Signature of the Chairman
Board of Studies - ECE

B.E-Electronics and Communication Engineering Regulation, Curriculum and Syllabus – R2024
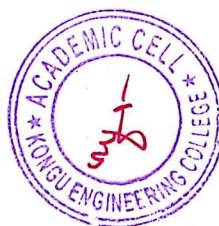
24GET31- UNIVERSAL HUMAN VALUES
(Common to All Engineering and Technology Branches)

Programme & Branch	All B.E & B.Tech Branches	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil.	3 / 6	HS	30	0	0	30	60	0

Preamble	To make the student to know what they 'really want to be' in their life and profession, understand the meaning of happiness and prosperity for a human being. Also to facilitate the students to understand about harmony at all the levels of human living, and live accordingly

Unit – I	Introduction	6

Need and Basic Guidelines of Value Education – Content and Process of Value Education – Self Exploration – purpose of self-Exploration – Content and Process of Self exploration – Natural Acceptance – Realization and Understanding – Basic Human Aspirations – Continuous Happiness and Prosperity – Exploring Happiness and Prosperity – Basic Requirement for Fulfillment of Human Aspirations – Relationships – Physical Facilities – Right Understanding.

Unit – II	Harmony in the Self and Body	6

Human Being and Body – Understanding Myself as Co–existence of Self ('I') and Body, Needs of the Self and Body, Activities in the Self and Body, Self ('I') as the Conscious Entity, the Body as the Material Entity – Exercise – Body as an Instrument– Harmony in the Self ('I') – Understanding Myself – Harmony with Body.

Unit – III	Harmony in the Family and Society	6

Harmony in the Family – Justice – Feelings (Values) in Human Relationships – Relationship from Family to Society – Identification of Human Goal – Five dimensions of Human Endeavour.

Unit – IV	Harmony in Nature and Existence	6

Order of Nature – Interconnectedness – Understanding the Four order – Innateness – Natural Characteristic – Basic Activity – Conformance – Introduction to Space – Co–existence of units of Space – Limited and unlimited – Active and No–activity – Existence is Co–existence.

Unit – V	Implications of the above Holistic Understanding of Harmony on Professional Ethics	6

Values in different dimensions of Human Living – Definitiveness of Ethical Human Conduct –Implications of Value based Living – Identification of Comprehensive Human Goal – Humanistic Education – Universal Human Order – Competence and Issues in Professional Ethics.

TEXT BOOK:

1.	Gaur R.R., Sangal R., Bagaria G.P., "A Foundation Course in Human Values and Professional Ethics", 1st edition, Excel Books Pvt. Ltd., New Delhi, 2009.

REFERENCES:

1.	Ivan Illich, "Energy & Equity", The Trinity Press, USA, 1974.
2.	Schumacher E.F., "Small is Beautiful: a study of economics as if people mattered", 1st Edition, Britain, 1973.

*includes Term Work(TW) & Online / Certification course hours

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	identify the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society	Applying (K3)
CO2	interview between the Self and the Body, understand the meaning of Harmony in the Self, the Co–existence of Self and Body	Applying (K3)
CO3	build harmonious relationship based on trust, respect and other naturally acceptable feelings in human–human relationships and explore their role in ensuring a harmonious society	Applying (K3)
CO4	experiment with themselves to co-exist with nature by realising interconnectedness and the four orders of nature	Applying (K3)
CO5	identify the differences between ethical and unethical practices, and apply ethical and moral practices for a better living	Applying (K3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	2	2		1	2				2	3	2
CO2	3	2	2	2		1	2				2	3	2
CO3	3	2	2	2		1	2				2	3	2
CO4	3	2	2	2		1	2				2	3	2
CO5	3	2	2	2		1	2				2	3	2

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

ASSESSMENT PATTERN – THEORY

Test / Bloom's Category*	Remembering (K1) %	Understanding (K2) %	Applying (K3) %	Analyzing (K4) %	Evaluating (K5) %	Creating (K6) %	Total %
CAT1		80	20				100
CAT2		80	20				100
CAT3		80	20				100
ESE	NA						

* ±3% may be varied (CAT 1, 2 & 3 – 50 marks)

Signature of the Chairman
Board of Studies -

24ECL31 - DIGITAL ELECTRONICS LABORATORY

Programme & Branch	All BE/BTech Branches	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	3	PC	0	0	30	0	30	1

Preamble	To design and implement combinational & sequential logic circuits.

LIST OF EXPERIMENTS / EXERCISES:

1.	Verification of digital logic gates
2.	Design and Implementation of Combinational Circuits using logic gates
3.	Design and Implementation of 4-bit adder/subtractor using MSI device.
4.	Design and implement a function using multiplexers and decoders.
5.	Design and implement BCD adder using MSI devices.
6.	Design and implement BCD to seven segment display decoder.
7.	Verification of flip flops.
8.	Design and implement shift registers.
9.	Design and implement a MOD-n counter using JK Flip Flop.

REFERENCES/ MANUAL /SOFTWARE:

1.	Laboratory Manual

| COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	design, construct and verify combinational circuits using logic gates	Applying (K3), Precision (S3)
CO2	design, construct and verify combinational circuits using MSI devices	Applying (K3), Precision (S3)
CO3	design, construct and test sequential circuits using flipflops	Applying (K3), Precision (S3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	3			2		2	2			3	
CO2	3	3	3			2		2	2			3	
CO3	3	3	3			2		2	2			3	

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

Signature of the Chairman
Board of Studies - ECE
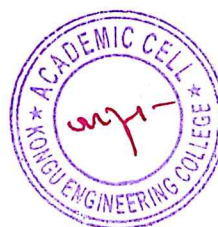
24ECL32 - ELECTRONIC DEVICES LABORATORY

Programme & Branch	BE ELECTRONICS AND COMMUNICATION ENGINEERING	Sem.	Category	L	T	P	SL*	Total	Credit
Prerequisites	Nil	3	BS	0	0	30	0	30	1

Preamble	To design a simple circuit using semiconductor devices

LIST OF EXPERIMENTS / EXERCISES:

1.	Characteristics of PN Junction Diode.
2.	Design a clipper and clamper circuits using PN junction diode.
3.	Input and Output characteristics of Common Emitter configuration
4.	Zener diode characteristics and Zener as a Regulator
5.	Drain current and Transfer Characteristics of MOSFET
6.	DIAC and TRIAC Characteristics
7.	Characteristics of UJT
8.	Characteristics of SCR
9.	Half wave Rectifier and Full wave rectifier with and without filter
10.	PSpice simulation: i) Characteristics of Common Collector configuration of BJT ii) Characteristics of JFET

REFERENCES/ MANUAL /SOFTWARE:

1.	Laboratory manual
2.	Orcad Cadence PSPICE software 16.6

COURSE OUTCOMES:

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	demonstrate the characteristics of different electronic devices such as PN diode, BJT, JFET, SCR	Applying (K3), Precision (S3)
CO2	construct various circuits (Clipper, Clamper, Half wave rectifier and Full wave rectifier with and without filters)	Applying (K3), Precision (S3)
CO3	develop a simple application using semiconductor devices	Applying (K3), Precision (S3)

Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	2	2		2	2	2	2		2	2	
CO2	3	2	2	2		2	2	2	2		2	2	
CO3	3	2	2	2		2	2	2	2		2	2	2

1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy

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