



SASURIE
COLLEGE OF ENGINEERING
(Autonomous)
Vijayamangalam, Tiruppur - 638056



CURRICULUM AND SYLLABI

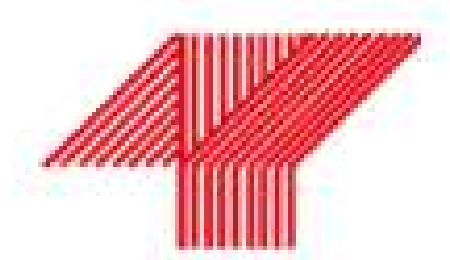
REGULATION 2026

DEPARTMENT OF
ELECTRONICS AND COMMUNICATION
ENGINEERING



SASURIE COLLEGE OF ENGINEERING

(Autonomous Institution, Affiliated to Anna University, Chennai)



CURRICULUM & SYLLABI – 2026

CHOICE BASED CREDIT SYSTEM AND OUTCOME BASED EDUCATION

(For the students admitted from the academic year 2026 - 2027)

BACHELOR OF ENGINEERING IN ELECTRONICS AND COMMUNICATION ENGINEERING

**DEPARTMENT OF ELECTRONICS AND
COMMUNICATION ENGINEERING**

VISION AND MISSION OF THE INSTITUTE

VISION

To become a leading professional institution by offering high-quality education, fostering successful graduates with strong employability prospects, advancing sustainable research through ethical practices and empowering young minds to contribute to the nation's growth in Engineering, Technology and Management.

MISSION

- To deliver high-quality education that empowers students with the knowledge, skills and ethical values necessary for success in Engineering, Technology and Management.
- To develop graduates with strong employability potential, fostering innovation, leadership and a commitment to continuous learning.
- To advance sustainable research and development that addresses real-world challenges and drives societal progress.
- To inspire and shape young minds into responsible professionals dedicated to contributing to the nation's growth and development.

VISION AND MISSION OF THE DEPARTMENT

VISION

To foster academic excellence imparting knowledge in Electronics, Communication and allied disciplines to meet the ever-growing needs of the society.

MISSION

- To impart quality education and develop an aptitude for professional career and continuous learning with ethics and social responsibility.
- To provide a framework for research and innovation to meet the emerging challenges through regular interaction with industry.
- To be a learner-centric environment by upgrading knowledge and skills to cater the needs and challenges of the society

Program Outcomes (POs)

PO1: Engineering Knowledge: Apply math, science, and engineering fundamentals to complex problems.

PO2: Problem Analysis: Identify and analyze complex problems using research and sustainability principles.

PO3: Design Solutions: Design systems and processes considering health, safety, cost, culture, and Environment.

PO4: Investigations: Use experiments, modelling, and data analysis to reach valid conclusions.

PO5: Engineering Tools: Apply modern tools for modelling and problem-solving, recognizing their limits.

PO6: Society & Environment: Assess societal, legal, and environmental impacts of engineering solutions.

PO7: Ethics: Commit to ethics, human values, diversity, and legal compliance.

PO8: Teamwork: Work effectively as an individual and in multidisciplinary teams.

PO9: Communication: Communicate clearly in reports, presentations, and documentation across diverse groups.

PO10: Management & Finance: Apply management and economic principles in projects and teamwork.

PO11: Lifelong Learning: Engage in continuous learning, adapt to new technologies, and think critically.

Program Educational Objectives (PEOs)

PEO 1: Apply principles of Electronics and Communication Engineering to provide solutions to the emerging problems in the society.

PEO 2: Embrace technological challenges through skill upgradation or higher education or research

PEO 3: Exhibit leadership qualities with professional and ethical values

.

Program Specific Outcomes (PSOs)

PSO1: To analyze, design and develop solutions by applying foundational concepts of electronics and communication engineering.

PSO2: To apply design principles and best practices for developing quality products for scientific and business applications.

**B.E- ELECTRONICS AND COMMUNICATION ENGINEERING
REGULATIONS 2026
For the students admitted from 2026 onwards
CHOICE BASED CREDIT SYSTEM
CURRICULUM FOR I - VIII SEMESTERS
SEMESTER I**

SL. NO.	COURSE CODE	COURSE TITLE	COURSE TYPE	CATEGORY	L	T	P	J	C
1	U26EN121	English Proficiency – I	L	HSMC	0	0	2	0	1
2	U26MA101	Matrices and Calculus	T	BSC	3	1	0	0	4
3	U26CY111	Chemistry for Electrical and Electronics engineering	TWL	BSC	2	0	2	0	3
4	U26EE101	Basic Electrical and Electronics Engineering	T	ESC	3	0	0	0	3
5	U26CS112	Problem Solving using C Programming	TWL	ESC	3	0	2	0	4
6	U26ME111	Engineering Graphics	TWL	ESC	2	0	2	0	3
7	U26ME121	Engineering Practices Laboratory	L	ESC	0	0	4	0	2
Total					13	1	12	0	20
MANDATORY CREDIT COURSES (MCC - Non CGPA) / MANDATORY NON-CREDIT COURSES (MNC)									
8	U26MC101	Induction Program – Universal Human Values – I	T	MCC	3	0	0	0	3
9	U26TA101	தமிழ்மரபு / Heritage of Tamils	T	MCC	1	0	0	0	1

SEMESTER II

SL. NO.	COURSE CODE	COURSE TITLE	COURSE TYPE	CATEGORY	L	T	P	J	C
1	U26EN221	English Proficiency – II	L	HSMC	0	0	2	0	1
2	U26MA201	Differential Equation and Complex Analysis	T	BSC	3	1	0	0	4
3	U26PH211	Physics for Electronics Engineering	TWL	BSC	2	0	2	0	3
4	U26EC201	Circuit Analysis	T	PCC	3	0	0	0	3
5	-U26EC202	Principles of Communication Systems	T	PCC	3	0	0	0	3
6	U26EC211	Electron Devices	TWL	PCC	3	0	2	0	4
7	U26EE212	Python programming and its applications	TWL	ESC	2	0	2	0	3
8	U26CEC01	Design Thinking	TWL	PCC	1	0	2	0	2
Total					17	1	10	0	23
MANDATORY CREDIT COURSES (MCC - Non CGPA) / MANDATORY NON-CREDIT COURSES (MNC)									
9	U26MC201	Universal Human Values – II	T	MCC	3	0	0	0	3
10	U26TA201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	T	MCC	1	0	0	0	1

SEMESTER III

SL. NO.	COURSE CODE	COURSE TITLE	COURSE TYPE	CATEGORY	L	T	P	J	C
1		English Proficiency – III	L	HSMC	0	0	2	0	1
2		Probability and Random Process	T	BSC	3	1	0	0	4
3		Digital System Design	TWL	PCC	3	0	2	0	4
4		Control Systems	T	PCC	3	0	0	0	3
5		Signals and Systems	T	PCC	3	0	0	0	3
6		Data Structures	TWL	BSC	2	0	2	0	3
7		Digital Communication	L	PCC	3	0	0	0	3
8		Environmental Science and Sustainability	T	ESC	2	0	0	0	2
9		Electric System Problem Solving and Mini project	J	PCC	0	0	0	2	1
Total					19	1	6	2	24
MANDATORY CREDIT COURSES (MCC - Non CGPA) / MANDATORY NON-CREDIT COURSES (MNC)									
10		Constitution of India	T	MCC	1	0	0	0	1

SEMESTER IV

SL. NO.	COURSE CODE	COURSE TITLE	COURSE TYPE	CATEGORY	L	T	P	J	C
1		English Proficiency – IV	L	HSMC	0	0	2	0	1
2		Microcontrollers and Embedded Systems	TWL	PCC	2	0	2	0	3
3		Linear Integrated Circuits	TWL	PCC	2	0	2	0	3
4		Electromagnetic fields	T	PCC	3	1	0	0	4
5		Digital Signal Processing	T	PCC	3	0	0	0	3
6		Digital Signal Processing Lab	L	PCC	0	0	4	0	2
7		Networks and Security	T	PCC	2	0	0	0	2
8		Networks and Security Lab	L	EEC	0	0	2	0	1
9		Open Elective I	T	OEC	3	0	0	0	3
10		Design and Prototype - I	J	PCC	0	0	0	2	1
11		Professional Skill Training – I	L	EEC	0	0	4	0	2
Total					15	1	16	2	25
MANDATORY CREDIT COURSES (MCC - Non CGPA) / MANDATORY NON-CREDIT COURSES (MNC)									
12		Essentials of Indian Traditional Knowledge	T	MCC	1	0	0	0	1

SEMESTER V

Sl. NO.	COURSE CODE	COURSE TITLE	COURSE TYPE	CATEGORY	L	T	P	J	C
1		Embedded System and IOT Design	TWL	PCC	3	0	2	0	4
2		Artificial Intelligence and Machine Learning	WL	ESC	3	0	2	0	4
3		Analog IC Design	T	PCC	3	0	0	0	3
4		Professional Elective – I	T	PCC	3	0	0	0	3
5		Open Elective – II	T	OEC	3	0	0	0	3
6		Design and Prototype II	J	EEC	0	0	0	4	2
7		Professional Skill Training – II	L	EEC	0	0	4	0	2
Total					15	0	8	4	21

SEMESTER VI

Sl. NO.	COURSE CODE	COURSE TITLE	COURSE TYPE	CATEGORY	L	T	P	J	C
1		VLSI and Chip Design	TWL	PCC	3	0	2	0	4
2		Wireless Communication	TWL	PCC	3	0	2	0	4
3		Transmission lines and RF Systems	T	PCC	3	0	0	0	3
4		Wireless Sensor Networks Design	T	PCC	3	0	0	0	3
5		Professional Elective – II	T	PEC	3	0	0	0	3
6		Antenna Design	T	PCC	3	0	0	0	3
7		Image Processing	T	PEC	3	0	0	0	3
Total					21	0	4	0	23

SEMESTER VII

SL. NO.	COURSE CODE	COURSE TITLE	COURSE TYPE	CATEGORY	L	T	P	J	C
1		Principles of Management	T	HSMC	3	0	0	0	3
2		Mobile Communication and Networks	T	PCC	3	0	0	0	3
3		Professional Elective – III	T	PEC	3	0	0	0	3
4		Professional Elective – IV	T	PEC	3	0	0	0	3
5		Optical Communication	T	PCC	3	0	0	0	3
6		Project work Phase – I	J	EEC	0	0	0	4	2
Total					18	0	0	4	17

SEMESTER VIII

SL.NO	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	J	C
1		Internship / Industrial Training*	EEC	0	0	0	0	2
2		Project work Phase – II	EEC	0	0	0	20	10
Total				0	0	0	20	12

***4 Weeks duration in any semester vacation from II to VI Semester**

TOTAL CREDITS:165

SEMESTER I

U26EN121	ENGLISH PROFICIENCY – I (common to all programmes)	Category: HSMC				
		L	T	P	J	C
		0	0	2	0	1

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

- To build basic English communication skills through practical language activities.
- To improve pronunciation, vocabulary, and grammar for effective communication.

COURSE OUTCOMES:

COURSE OUTCOMES:		BT Mapped (Highest Level)
On completion of the course, the students will be able to		
CO1	Demonstrate the ability to understand and use basic English in everyday communication.	Understand
CO2	Apply appropriate grammar, vocabulary, and pronunciation in simple spoken and written contexts.	Apply
CO3	Interpret technical documents and case studies and communicate key insights gained from the life stories of scientists, innovators and entrepreneurs	Analyze

CO PO MAPPING

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

Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)

SYLLABUS:**UNIT I - READING AND INTERPRETATION****10**

Vocabulary in context-Discourse Markers-Reading Techniques-Oral,Reading:Rhythm and Intonation-Analytical Interpretation-Comprehension and story Analysis-Evaluative Reading of Summaries and Findings from Journals / Articles / Online Content.

UNIT II - PRINT MEDIA AND LITERATURE**10**

Print Media Study: Editorials, Views and Features Articles-Short Story: The Last Leaf-OHenry-Science Fiction: The Time Machine-H.G.Wells .

UNIT III - CASE STUDIES AND INSPIRING INNOVATORS**10**

Reading Technical Documents (Guidelines & Manuals)-Case Study Review (Field Based Learning)-A Case Analysis-Life Stories of Renowned Scientists and Innovators-Inspiring Journeys of Entrepreneurs and Emerging Ventures.

Contact Periods:

Lecture: -

Tutorial: -

Practical: 30 Periods

Total: 30 Periods**TEXT BOOKS:**

1. O. Henry. *The Complete Short Stories of O. Henry*. Dover Publications, 2019. Comprehensive collection of O. Henry's stories, including *The Last Leaf*.

2.H.G.Wells. *The Time Machine* Penguin Classics 2018. Standard academic edition with notes and analysis for study.

REFERENCES:

1.Well.H.G *The Time Machine* Penguin Classics 2012 [http://library.org/books/OL26970973M/The time machine_%28Penguin_Classics%29](http://library.org/books/OL26970973M/The%20time%20machine_%28Penguin_Classics%29).

2.McWhorter, Kathleen, and Brette M. Sember. *College Reading and StudySkills*.14th ed., Pearson, 2021. <https://www.pearson.com/en-us/pearsonplus/p/9780137530809>

EVALUATION PATTERN:

Continuous Internal Assessments		End Semester Examinations (practical)	
		Test/Report Evaluation	Presentation & Viva
Practical			
Evaluation of students work, Observation, Record, etc.	Lab test (model practical)		
45 (100)	15 (100)	30 (80)	10 (20)
60		40	
Total		100	

U26MA101	MATRICES AND CALCULUS (common to all programmes)	Category: BSC				
		L	T	P	J	C
		3	1	0	0	4

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

- To develop the use of matrix algebra techniques that is needed by engineers for practical applications
- To familiarize the students with differential calculus
- Analyze vector fields using gradient, divergence, and curl; verify and apply Green's, Gauss divergence in practical problems
- To make the students understand various techniques of integration
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their applications.

COURSE OUTCOMES:

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Use the matrix algebra methods for solving practical problems	Apply
CO2	Apply differential calculus tools in solving various application problems.	Apply
CO3	Compute the total derivatives and extreme values of multivariable functions	Apply
CO4	Compute double and triple integrals in Cartesian coordinates to determine geometric areas and volumes.	Apply
CO5	Analyze vector fields using gradient, divergence, and curl; verify and apply Green's, Gauss divergence in engineering problems	Apply

CO PO MAPPING

[illegible]

SYLLABUS:**UNIT -I MATRICES****9**

Characteristic equation - Eigen values and Eigenvectors of a real matrix – Properties of Eigen Values and Eigen Vectors - Cayley - Hamilton theorem – Orthogonal transformation of a real symmetric matrix to the diagonal form – Quadratic form – Nature of Quadratic forms - Reduction of quadratic form to the canonical form by orthogonal transformation. – Applications: Stretching of an elastic membrane.

UNIT-II DIFFERENTIAL CALCULUS**9**

Functions - graph of functions - Limit of a function – Continuity - Limits at infinity - Maxima and Minima of functions of single variable - Mean value theorem - Effect of derivatives on the shape of a graph.

UNIT III FUNCTIONS OF SEVERAL VARIABLES**9**

Functions of two or more variables – Partial derivatives – Homogeneous functions and Euler's theorem- Total differential –Chain Rule- Applications: Maxima and minima – Constrained maxima and minima – Lagrange's multiplier method.

UNIT IV 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 V VECTOR CALCULUS**9**

Gradient, divergence and curl – Directional derivative – Irrotational and Solenoid vector fields - Green's theorem in a plane - Gauss divergence theorem (excluding proofs) – Verification of theorem and simple applications.

Contact Periods:

Lecture: 45 Periods

Tutorial: 15 Periods

Practical: -

Total: 60 Periods**TEXT BOOKS:**

1. George B. Thomas Jr., Maurice D. Weir and Joel R. Hass, Thomas' Calculus: Early Transcendentals, 13th Edition, Pearson Education, 2014
2. P. Kandasamy, K. Thilagavathi and K. Gunavathi, Engineering Mathematics, Reprint Edition, S.Chand and Co., New Delhi, 2026

REFERENCES:

1. Engineering Mathematics – S. Narayanan, T. K. Manicavachagom Pillay & G. Ramanaiah, (Latest Reprint), S. Viswanathan Publishers.

2. Engineering Mathematics – B. K. Pal & K. Das, (Latest Edition), Oxford University Press India.
3. Advanced Engineering Mathematics, Erwin Kreyszig, 10th Edition (2018), Wiley India
4. Grewal B.S., “Higher Engineering Mathematics” 45th Edition, Khanna Publishers, New Delhi, 2024

EVALUATION PATTERN:

Continuous Assessments			End Semester Examinations
CIAT 1	CIAT 2	Activities	
40%			60%
16(60)	16(60)	8(40)	60(100)

- Nil

- To understand the principles of electrochemistry and EMF calculations.
- To learn corrosion mechanisms and methods of prevention.
- To study batteries and fuel cells for energy applications.
- To Analyze organic electronic materials and their device applications
- To learn insulating materials and their properties for engineering use.

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Apply electrochemical concepts to analyze cells and calculate EMF.	Apply
CO2	Analyze corrosion and select suitable control methods.	Analyze
CO3	Analyze the process of combustion and their fabrication.	Evaluate
CO4	Analyze organic electronic materials and their device applications	Analyze
CO5	Apply knowledge of insulating materials in electrical and electronic applications.	Apply

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	—	2	2	—	—	—	—	—	—	2	1
CO2	3	3	2	2	—	3	2	—	—	—	—	2	1
CO3	3	3	2	2	—	2	—	—	—	—	—	3	2
CO4	3	2	3	2	3	—	—	—	—	—	—	1	-
CO5	3	2	3	2	3	—	—	—	—	—	—	3	2

Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)

1. Estimation of total hardness of water by EDTA method.
2. Determination of rate of corrosion of mild steel by weight loss method.

3. Determination of chloride content in water sample by argentometric method.
4. Determination of pKa of a weak acid using glass electrode (pH sensor).
5. Determination of strength of HCl acid by using pH meter.
6. Estimation of Ferrous iron by potentiometric Titration.
7. To find Viscosity of a Transparent Liquid (Virtual lab) (<https://bop-iitk.vlabs.ac.in/exp/liquid-viscosity/index.html>)

Contact Periods:

Lecture: 30 Periods

Tutorial: -

Practical: 30 Periods

Total: 60 Periods**TEXT BOOKS:**

1. Engineering Chemistry, P. C. Jain & Trishla Jain, 2023, 17th Edition, Dhanpat Rai & Co. (P) Ltd., New Delhi. ISBN-13: 978-9352165728
2. Engineering Chemistry, S. S. Dara & S. S. Umare, 2022 Edition, S. Chand Publications, New Delhi. ISBN-13: 978-9352533241.

REFERENCES:

1. Friedrich Emich, "Engineering Chemistry", 2nd Edition, Scientific International Pvt. Ltd, New Delhi, 2014.
2. Prasanta Rath, "*Engineering Chemistry*", 1st Edition, Cengage Learning India, Pvt. Ltd, Delhi, 2015
3. V. Raghavan & J. R. Gopalakrishnan, *Engineering Chemistry*, McGraw-Hill Education.
4. Linden & Reddy, Handbook of Batteries, McGraw-Hill Education.
5. *Energy storage and conversion devices*, Anurag Gaur, A. L. Sharma, Anil Arya, 1st Edition, 2021, CRC Press, Taylor and Francis Group, ISBN: 9781003141761.
6. <https://nptel.ac.in/courses/113/104/113104008>
7. https://onlinecourses.nptel.ac.in/noc24_me34/preview%20%20
8. <https://www.vlab.co.in/broad-area-chemical-sciences>

EVALUATION PATTERN:

Continuous Assessments					End Semester Examinations
Theory			Practical / Project		Theory
CIAT 1	CIAT 2	Activities	Evaluation of Student's work, Observation, Record, etc.	Lab Test	
35%			15%		50%
15(60)	15(60)	5(40)	10(75)	5(25)	50(100)

NIL

The course aims to:

- COURSE OUTCOMES:**

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Compute the electric circuit parameters for simple problems.	Apply
CO2	Explain the working principle and applications of electrical machines.	Understand
CO3	Analyze the characteristics of analog electronic devices.	Apply
CO4	Explain the basic concepts of digital electronics.	Understand
CO5	Explain the operating principles of measuring instruments.	Understand

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	2	1	-	-	-	-	1	-	-	2	-	-
CO2	2	2	1	-	-	-	-	1	-	-	2	-	-
CO3	2	1	1	-	-	-	-	1	-	-	2	1	1
CO4	2	2	1	-	-	-	-	1	-	-	2	1	1
CO5	2	2	1	-	-	-	-	1	-	-	2	1	1

Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)

SYLLABUS:**Unit I ELECTRICAL CIRCUITS 9**

DC Circuits: Circuit components – conductor, resistor, inductor, capacitor – Ohm’s law – Kirchhoff’s laws – independent and dependent sources– nodal analysis – mesh analysis with independent sources only. Introduction to AC circuits and parameters: waveforms – average value – RMS value – instantaneous value, real power, reactive power and apparent power, power factor – steady state analysis of RLC circuits.

Unit II ELECTRICAL MACHINES 9

Construction and working principle of DC Generator– EMF equation, types and applications. Working principle of DC motor –Torque Equation, types and applications. Construction, working principle and applications of Transformer, Alternator, Synchronous motor and Three phase Induction motors

Unit III ANALOG ELECTRONICS 9

Semiconductor materials: silicon and germanium – PN junction diode, Zener diode – characteristics and applications – BJT, JFET, SCR, MOSFET, IGBT-types, characteristics and applications. Rectifier and Inverters.

Unit IV DIGITAL ELECTRONICS 9

Review of number systems, binary codes, error detection and correction codes, combinational logic – representation of logic functions – SOP and POS forms, K-map representations – minimization using K-maps.

Unit V V MEASUREMENTS AND INSTRUMENTATION 9

Functional elements of an instrument – operating principle, types – moving coil and moving iron meters – measurement of three phase power, energy meter — DSO- block diagram – data acquisition

Contact Periods:

Lecture: 45 Periods

Tutorial: -

Practical: -

Total: 45 Periods**TEXT BOOKS:**

- 1.Kothari DP and I.J Nagrath, “Basic Electrical and Electronics Engineering”, Second Edition, McGraw Hill Education, 2020
2. S.K.Bhattacharya “Basic Electrical and Electronics Engineering”, Pearson Education, Second Edition, 2017.

REFERENCES:

- 1.Kothari DP and I.J Nagrath, “Basic Electrical Engineering”, Fourth Edition, McGraw Hill Education, 2019.
2. Thomas L. Floyd, ‘Digital Fundamentals’, 11th Edition, Pearson Education, 2017.

3. Albert Malvino, David Bates, ‘Electronic Principles, McGraw Hill Education; 7th edition, 2017.

A.K. Sawhney, Puneet Sawhney ‘A Course in Electrical & Electronic Measurements & Instrumentation’, Dhanpat Rai and Co, 2015.

EVALUATION PATTERN:

Continuous Assessments			End Semester Examinations
CIAT 1	CIAT 2	Activities	
40%			60%
16 (60)	16 (60)	8 (40)	60 (100)

- Nil

- Understand the fundamentals of algorithms, flowcharts, and structured programming concepts.
- Develop C programs using decision making and iterative constructs.
- Apply arrays, strings, functions, and pointers for engineering problem solving.
- Implement structures and file handling for real-world data processing.
- Develop practical programming skills through laboratory implementation.

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Explain algorithms, flowcharts, and C programming fundamentals	Understanding
CO2	Develop C programs using decision making and looping constructs	Apply
CO3	Apply arrays and strings for engineering problem solving.	Apply
CO4	Implement functions and pointers in modular programming	Apply
CO5	Develop complete applications using structures and file handling	Apply

[illegible]

SYLLABUS:

UNIT I – PROBLEM SOLVING BASICS AND C FUNDAMENTALS 9

Introduction to problem solving – steps in problem solving – algorithm – flowchart – pseudocode – structure of C program – character set – tokens – keywords – identifiers – constants – variables – data types – operators – input and output statements.

UNIT II – DECISION MAKING AND LOOPING 9

Conditional statements – if, if-else, nested if, switch – looping statements – for, while, do-while – jump statements – break, continue.

UNIT III – ARRAYS AND STRINGS 9

One-dimensional arrays – two-dimensional arrays – matrix operations – string declaration – string handling functions – applications.

UNIT IV – FUNCTIONS AND POINTERS 9

Function declaration and definition – call by value – call by reference – recursion – pointers – pointer arithmetic – pointers with arrays.

UNIT V – STRUCTURES AND FILE HANDLING 9

Structures – nested structures – arrays of structures – file handling – file opening and closing – read, write and append operations.

LIST OF EXPERIMENTS

1. Write a C program to find the sum, average, and percentage of three numbers
2. Write a C program to swap two numbers with and without temporary variable
3. Write a C program to calculate simple interest and compound interest
4. Write a C program to find the largest of three numbers.
5. Write a C program to generate Fibonacci series up to n terms
6. Write a C program to sort array elements in ascending order
7. Write a C program using function to find GCD of two numbers
8. Write a C program using structure to store student details and display mark sheet
9. Write a C program to write and read data from a file
10. Write a mini program for electricity bill calculation using file handling

Contact Periods:

Lecture: 45 Periods

Tutorial: -

Practical: 30 Periods

Total: 75 Periods**TEXT BOOKS:**

1. E. Balagurusamy, *Programming in ANSI C*, McGraw Hill Education, 8th Edition.
2. Brian W. Kernighan & Dennis M. Ritchie, *The C Programming Language*, Pearson Education, 2nd Edition.

REFERENCES:

1. Brian W. Kernighan & Dennis M. Ritchie, *The C Programming Language*, Pearson Education, 2nd Edition.
2. Yashavant Kanetkar, *Let Us C*, BPB Publications, Latest Edition.
3. Herbert Schildt, *C: The Complete Reference*, McGraw Hill Education.
4. Paul Deitel & Harvey Deitel, *C: How to Program*, Pearson Education.

EVALUATION PATTERN:

Continuous Assessments					End Semester Examinations
Theory			Practical / Project		Theory
CIAT 1	CIAT 2	Activities	Evaluation of Student's work, Observation, Record, etc.	Lab Test	
35 %			15 %		50%
15(60)	15(60)	5(40)	10(75)	5(25)	50(100)

U26ME111	ENGINEERING GRAPHICS	Category: ESC				
		L	T	P	J	C
		2	0	2	0	3

COURSE OBJECTIVES:

- To impart knowledge on dimensions and drawing standards.
- To explore the orthographic projection of lines and solids.
- To provide the understanding of orthographic, isometric and perspective views.

COURSE OUTCOMES:

Upon completion of the course, the student will be able to		BTMapped (Highest Level)
CO1	Explain the advantages of engineering drawing in engineering applications.	Understand
CO2	Apply the concepts of projections in formulating various solid parts in engineering systems.	Apply
CO3	Analyse the various view and interpret the engineering drawings	Analyze
CO4	Use CAD tools for creation of various models.	Apply
CO5	Critically think and develop innovative models.	Apply

CO PO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	1	2	-	2	-	-	-	-	3	2	2	2
CO2	3	1	2	-	2	-	-	-	-	3	2	2	2
CO3	3	1	2	-	2	-	-	-	-	3	2	2	2
CO4	3	1	2	-	2	-	-	-	-	3	2	2	2
CO5	3	1	2	-	2	-	-	-	-	3	2	2	2
Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)													

SYLLABUS:**MODULE I: Fundamentals****6+6**

Drawing instruments, Drawing standards (BIS), Lettering in engineering, Sheet layout, elements of dimensioning, Systems of dimensioning. Free hand sketching of 2D & 3D objects, Conics – Ellipse, Parabola and Hyperbola.

Activities: Virtual Demonstration of Conics and Cycloids.

MODULE II: Orthographic Projection 6+6

First angle projection, Projection of points, straight lines and planes.

Activities: Virtual Demonstration of Points, Lines and Planes.

MODULE III: Projection of Solids 6+6

Simple Solids, Section of Solids, Development of Surfaces.

Activities: Development of models of various solids and virtual demonstration of sectioning, CAD modelling of 2D objects.

MODULE IV: Isometric Projection 6+6

Isometric Scale, Projection of Simple solids.

Activities: Conversion of 3D into 2D orthographic views, CAD modelling of 3D objects.

MODULE V: Perspective Projection 6+6

Simple solids projection.

Activities: Virtual demonstration of perspective views.

Contact Periods:

Lecture: 30 Periods

Tutorial: -

Practical: 30 Periods

Total: 60 Periods

REFERENCES:

1. Natarajan, K. V. (2025). A Text Book of Engineering Graphics. Dhanalakshmi Publisher.
2. Venugopal, K., & Prabhu Raja, V. (2022). Engineering Drawing + AutoCAD. New Age International Publishers.

E-Resources:

1. CAD Software – <https://www.freecadweb.org/>
2. Engineering Drawing and Computer Graphics, Prof. Rajaram Lakkaraju (IIT Kharagpur) – https://onlinecourses.nptel.ac.in/noc22_me105/preview.
3. MIT Design Handbook: Engineering Drawing and Sketching – https://ocw.mit.edu/courses/2-007-design-and-manufacturing-i-spring-2009/pages/related-resources/drawing_and_sketching/

EVALUATION PATTERN:

Continuous Assessments					End Semester Examinations
Theory			Practical / Project		Theory
CIAT 1	CIAT 2	Activities	Evaluation of Student's work, Observation, Record, etc.	Lab Test	
35%			15%		50%
15(60)	15(60)	5(40)	10(75)	5(25)	50(100)

U26ME121	ENGINEERING PRACTICES LABORATORY	Category: PCC				
		L	T	P	J	C
		0	0	4	0	2

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

The course aims to:

1. Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work.
2. Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipments; Making a tray out of metal sheet using sheet metal work.
3. Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB Wiring various electrical joints in common household electrical wire work.

COURSE OUTCOMES:

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household woodwork.	Apply
CO2	Wire various electrical joints in common household electrical wire work	Apply
CO3	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work.	Apply
CO4	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.	Apply

CO PO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	1	1	1	-	-	-	-	2	-
CO2	3	2	-	3	1	1	1	-	-	-	-	2	-
CO3	3	2	-	2	1	1	1	-	-	-	-	2	-
CO4	3	2	-	2	1	1	1	-	-	-	-	2	-

Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)

SYLLABUS:

GROUP – A (CIVIL & ELECTRICAL)

PART I CIVIL ENGINEERING PRACTICES

15

PLUMBING WORK

- a) Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in household.
- b) Preparing plumbing line sketches.
- c) Laying pipe connection to the suction side of a pump
- d) Laying pipe connection to the delivery side of a pump.
- e) Connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances

WOOD WORK

- a) Sawing.
- b) Planing.
- c) Making joints like T-Joint, Mortise joint, Tenon joint and Dovetail joint.

Wood Work Study:

- a) Studying joints in door panels and wooden furniture.
- b) Studying common industrial trusses using models.

PART II ELECTRICAL ENGINEERING PRACTICES

15

- a) Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin socket
- b) Staircase wiring
- c) Fluorescent Lamp wiring with introduction to CFL and LED types.
- d) Energy meter wiring and related calculations/ calibration
- e) Study of Iron Box wiring and assembly
- f) Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac)
- g) Study of emergency lamp wiring/Water heater

PART III MECHANICAL ENGINEERING PRACTICES

15

WELDING WORK:

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

- b) Practicing gas welding.

BASIC MACHINING WORK:

- a) simple Turning.
- b) simple Drilling.
- c) simple Tapping

ASSEMBLY WORK:

- a) Assembling a centrifugal pump.
- b) Assembling a household mixer.
- c) Assembling an airconditioner.

SHEET METAL WORK:

- a) Making of a square tray

FOUNDRY WORK:

- a) Demonstrating basic foundry operations.

PART IV ELECTRONICS ENGINEERING PRACTICES**15****SOLDERING WORK:**

- a) Soldering simple electronic circuits and checking continuity.

ELECTRONIC ASSEMBLY AND TESTING WORK:

- a) Assembling and testing electronic components on a small PCB.

ELECTRONIC EQUIPMENT STUDY:

- a) Study an elements of smart phone.
- b) Assembly and dismantle of LED TV.
- c) Assembly and dismantle of computer/ laptop

Contact Periods:

Lecture: -

Tutorial :

Practical: 60 Periods

Total: 60 Periods**EVALUATION PATTERN:**

Continuous Internal Assessments		End Semester Examinations (practical)	
		Test/Report Evaluation	Presentation & Viva
Practical			
Evaluation of students work, Observation, Record, etc.	Lab test (model practical)		
45(100)	15(100)	30(80)	10(20)
60		40	
Total		100	

U26MC101	INDUCTION PROGRAM - UNIVERSAL HUMAN VALUES – I	Category: MCC				
		L	T	P	J	C
		3	0	0	0	3

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

- Development of a holistic perspective based on self-exploration about themselves (human beings), family, society, and nature/existence
- Understanding (or developing clarity) of the harmony in the human being, family, society, and nature/existence
- Strengthening of self-reflection

COURSE OUTCOMES:

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Recognize the essentials of human values and skills	Understand
CO2	Analyse connection between profession and happiness	Understand
CO3	Develop appropriate technologies and management patterns to create harmony in family and society	Understand
CO4	Evaluate the significance of trust, mutually satisfying human behaviour, and enriching interaction with nature	Understand
CO5	Demonstrate professional and ethical responsibility	Understand

CO PO MAPPING

[illegible]

SYLLABUS:**UNIT I: INTRODUCTION - NEED, BASIC GUIDELINES, CONTENT, AND PROCESS FOR VALUE EDUCATION 9**

Purpose and motivation for the course – Self-Exploration: what is it – Its content and process; ‘Natural Acceptance’ and Experiential Validation as the mechanism for self-exploration – Continuous Happiness and Prosperity – A look at basic Human Aspirations – Right understanding, Relationship, and Physical Facilities – the basic requirements for the fulfillment of aspirations of every human being with their correct priority – Understanding Happiness and Prosperity correctly – A critical appraisal of the current scenario – Method to fulfill the above human aspirations: understanding and living in harmony at various levels

UNIT II: HARMONY IN THE HUMAN BEING - HARMONY IN MYSELF 9

Understanding human beings as a co-existence of the sentient ‘I’ and the material ‘Body’ – Understanding the needs of Self (‘I’) and ‘Body’ – Happiness and Convenience – Understanding the Body as an instrument of ‘I’ (I being the doer, seer, and enjoyer) – Understanding the harmony of I with the Body: Self-control and Welfare; correct appraisal of Physical needs – Meaning of Prosperity in detail – Programs to ensure Self-control and Welfare

UNIT III: HARMONY IN THE FAMILY AND SOCIETY 9

Understanding values in human – Human relationships: the meaning of Justice (nine universal values in relationships) and the program for its fulfillment to ensure satisfaction – Trust and Respect as the foundational values of relationship – Understanding the meaning of Trust – Difference between intention and competence – Understanding the meaning of Respect – The difference between respect and differentiation; and the other salient values in relationship – Understanding the harmony in the society (society being an extension of the family): Peace, Prosperity, Courage, and Coexistence as comprehensive Human Goals – Visualizing a universal harmonious order in society – Undivided Society – Universal Order from family to world family

UNIT IV: HARMONY IN THE NATURE AND EXISTENCE 9

Understanding the harmony in Nature, Interconnectedness, and mutual fulfillment among the four orders of nature – Recyclability and self-regulation in nature – Understanding Existence as a Co-existence of mutually interacting units in an all-pervasive space – Holistic perception of harmony at all levels of existence – Practice sessions to discuss human beings as the cause of imbalance in nature (film “Home” can be used), pollution, depletion of resources and role of technology, etc

UNIT V: HARMONY ON PROFESSIONAL ETHICS 9

Natural acceptance of human values – Definiteness of Ethical Human Conduct – Basis for Humanistic Education – Humanistic Constitution, and Humanistic Universal Order – Competence in professional ethics – Ability to utilize the professional competence for augmenting universal human order, Ability to identify the scope and characteristics of people, friendly and eco-friendly production systems, and Ability to identify and develop appropriate technologies and management patterns for the above production systems – Case studies of typical holistic technologies, management models, and production systems – Strategy for a transition from

the present state to Universal Human Order – At the level of the individual: as socially and ecologically responsible engineers, technologists, and managers – At the level of society: as mutually enriching institutions and organizations

Contact Periods:

Lecture: 45 Periods

Tutorial: -

Practical: -

Total: 45 Periods**TEXT BOOKS:**

1. R R Gaur, R. Asthana, G P Bagaria, *A Foundation course in Human Values and Professional Ethics*, 3rd Edition, Excel Books, New Delhi, 2024
2. Prof. K. V. Subba Raju, *Success Secrets for Engineering Students*, Smart Student Publications, 3rd Edition, 2013

REFERENCES:

1. Ivan Illich, *Energy & Equity*, The Trinity Press, Worcester, and HarperCollins, USA, 1974
2. E. F. Schumacher, *Small is Beautiful: a study of economics as if people mattered*, Blond & Briggs, Britain, 1973

EVALUATION PATTERN:

Continuous Internal Assessments	
Assessment 1 (100 Marks)	
Total	100

[illegible]

SYLLABUS:

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

Tattooing, basket weaving, Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, 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.

Contact Periods:

Lecture: 15 Periods	Tutorial: -	Practical: -	Total: 15 Periods
---------------------	-------------	--------------	--------------------------

TEXT BOOKS:

1. Ravikrishna K, Heritage of Tamils, Sri Krishna publications, First Edition, 2023.
2. S. Priyadarshini, Heritage of Tamils, V. K. Publications.

REFERENCES:

1. History, People and Culture of Tamil Nadu – K.K. Pillai, International Institute of Tamil Studies, C.P.T Campus, Chennai.
2. Computer Tamil – Dr. Il. Sundaram, Vikatan Publications, Anna Salai, Chennai, December 2016.

U26TA101	தமிழர்மரபு / Heritage of Tamils (Common to all programmes)	Category: MCC				
		L	T	P	J	C
		1	0	0	0	1

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

- தமிழின் செம்மொழி தன்மையையும் அதன் விரிவான இலக்கிய பாரம்பரியத்தை கற்றறிதல்.
- தமிழர் கலாச்சாரத்தில் உள்ள நுண்கலை மரபுகளைப் பரிசீலித்தல்.
- இந்திய விடுதலைப் போராட்டத்தில் தமிழர்களின் பங்களிப்பை உணர்தல்.

COURSE OUTCOMES:

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	தமிழ் மொழியின் விரிவான இலக்கியத்தையும் அதன் செம் மொழி தன்மையையும் புரிந்து கொள்ளுதல்.	Understand
CO2	பழங்கால மக்களின் சிற்பக்கலை, ஓவியக்கலை மற்றும் இசைக்கருவிகளின் பாரம்பரியத்தை புரிந்து கொள்ளுதல்.	Understand
CO3	தமிழர் நாட்டுப்புறக் கலைகள் மற்றும் போர்க்கலைகளை ஆய்வு செய்தல்.	Understand
CO4	திணை கருத்துக்கள், வர்த்தகம் மற்றும் சோழர் பேரரசின் வெற்றிகளை உணர்தல்.	Understand
CO5	இந்திய விடுதலைப் போராட்டத்தில் தமிழர்களின் பங்களிப்பு, சுயமரியாதை இயக்கம் மற்றும் சித்த மருத்துவத்தின் முக்கியத்துவத்தை புரிந்து கொள்ளுதல்	Understand

CO PO MAPPING

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

Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)

SYLLABUS:**UNIT I மொழி மற்றும் இலக்கியம் 3**

இந்தியமொழிக் குடும்பங்கள்- திராவிட மொழிகள் -தமிழ் ஒரு செம்மொழி-தமிழ் செவ்விலக்கியங்கள் -சங்க இலக்கியத்தின் சமய சார்பற்ற தன்மை சங்க இலக்கியத்தில் பகிர்தல் அறம்- திருக்குறள் மேலாண்மை கருத்துக்கள்- தமிழ்காப்பியங்கள்- தமிழகத்தில் சமண பௌத்தவ சமயங்களில் தாக்கம் -பக்தி இலக்கியம் ஆழ்வார்கள் மற்றும் நாயன்மார்கள் சிற்றிலக்கியங்கள்- தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி- தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

UNIT II மரபு-பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை- சிற்பக்கலை 3

நடு கல் முதல் நவீன சிற்பங்கள் வரை ஐம்பொன் சிலைகள் பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள் பொம்மைகள் தேர் செய்யும் கலை சுடுமண் சிற்பங்கள் நாட்டுப்புற தெய்வங்கள் குமரிமுனையில் திருவள்ளுவர்சிலைஇசைக்கருவிகள்மிருதங்கம்,பறை,வீணை,யாழ்,நாதஸ்வரம், தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோயில்களின் பங்கு.

UNIT III நாட்டுப்புறக் கலைகள் மற்றும்வீரவிளையாட்டுக்கள் 3

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான்கூத்து,ஒயிலாட்டம் ,தோல்பாவைகூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுக்கள்.

UNIT IV தமிழர்களின்திணைக்கோட்பாடுகள் 3

தமிழகத்தின் தாவரங்களும் விலங்குகளும்-தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புற கோட்பாடுகள் தமிழர்கள் போற்றிய அறக்கோட்பாடுகள்-சங்க காலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் சங்க கால நகரங்களும் துறைமுகங்களும் – சங்க காலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி-கடல் கடந்த நாடுகளின் சோழர்களின் வெற்றி.

UNIT V இந்திய தேசியஇயக்கம் மற்றும் இந்திய பண்பாட்டிற்கு தமிழர்களின்**பங்களிப்பு****3****இந்திய**

விடுதலைப் போரில் தமிழர்களின் பங்கு-இந்தியாவின் பிற பகுதிகளில் தமிழ் பண்பாட்டின் தாக்கம் சுயமரியாதை இயக்கம்-இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு கல்வெட்டுக்கள் கையெழுத்துப்படிக்கள்-தமிழ் புத்தகங்கள் அச்ச வரலாறு.

Contact Periods:

Lecture: 15 Periods

Tutorial: -

Practical: -

Total: 15 Periods

TEXT BOOKS:

1. ஜெயந்தி ரவிகிருஷ்ணா K, தமிழர்களின் பாரம்பரியம், ஸ்ரீ கிருஷ்ணா பதிப்பகம், முதல்பதிப்பு, 2023.
2. எஸ். பிரியதர்ஷினி, தமிழர்களின்பாரம்பரியம், வி. கே. பதிப்பகம்

REFERENCES:

1. தமிழக வரலாறு மக்களும் பண்பாடும் - கே.கே. பிள்ளை, International Institute of Tamil Studies, C.P.T Campus, Chennai.
2. கணினித்தமிழ் - முனைவர். இல. சுந்தரம், விகடன்பிரசுரம், அண்ணாசாலை, சென்னை, திசம்பர் 2016.

EVALUATION PATTERN:

Continuous Internal Assessments	
Assessment 1 (100 Marks)	
Total	100

SEMESTER-II

U26EN221	ENGLISH PROFICIENCY-II (Common to all programmes)	Category: HSMC				
		L	T	P	J	C
		0	0	2	0	1

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

- To develop students' ability to comprehend, analyse, and articulate complex ideas effectively.
- To enable students to use English proficiently for research, presentations, technical documentation, and collaborative projects.

COURSE OUTCOMES:

COURSE OUTCOMES: On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Interpret advanced texts, research articles, and multimedia content to identify key ideas, arguments, and perspectives.	Apply
CO2	To do clear and well-structured oral presentations that effectively communicate ideas in academic and workplace contexts.	Understand
CO3	Analyze research findings, interpret data and communicate results effectively through written and oral communication.	Analyze

CO PO MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	2	-	-	-	-	-	2	3	-	-	-	2
CO2	1	2	-	-	-	-	1	2	2	-	-	1	2
CO3	1	3	-	3	-	-	-	3	3	-	1	1	3
Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)													

SYLLABUS:**UNIT I LISTENING & SPEAKING SKILLS:****10**

Oral presentations: structuring arguments and persuasive speech – Listening comprehension: podcasts, interviews, and webinars analysis - Debates and role-plays on contemporary issues

UNIT II MEDIA & LITERATURE EXPLORATION

10

Science communication - Multimedia content: analyzing podcasts, TED Talks, and webinars - Film and documentary reviews: narrative techniques and critical perspectives

UNIT III RESEARCH & PRESENTATION SKILLS

10

Conducting mini-research in lab or field environments - Data interpretation and reporting findings in written and oral forms - Peer review sessions to enhance collaborative learning

Contact Periods:

Lecture: --

Tutorial: --

Practical: 30 Periods

Total: 30 Periods

TEXT BOOKS:

1. Bailey, Stephen. *Academic Writing: A Handbook for International Students*. 5th ed., Routledge, 2018.
2. Rizvi, Ashraf M. *Effective Technical Communication*. 2nd ed., McGraw Hill Education, 2017.

REFERENCES:

1. Markel, Mike H., and Stuart A. Selber. *Technical Communication*. 12th ed., Bedford/St. Martin's, 2018.
2. Hall, Lynn, and Leah Wahlin. *A Guide to Technical Communications: Strategies & Applications*. Ohio State University Libraries, 2016.

EVALUATION PATTERN:

Continuous Internal Assessments		End Semester Examinations (practical)	
Practical		Test/Report Evaluation	Presentation & Viva
Evaluation of students work, Observation, Record, etc.	Lab test (model practical)		
45(100)	15(100)	30(80)	10(20)
60		40	
Total		100	

U26MA201	DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS (Common for ECE, EEE, MECH)	Category: BSC				
		L	T	P	J	C
		3	1	0	0	4

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

- Apply appropriate methods to solve higher-order linear ordinary differential equations with constant coefficients and obtain complementary functions and particular integrals.
- To learn Laplace transforms and apply them in solving differential equations
- To understand the concepts of singularities in the various domains of engineering field.

COURSE OUTCOMES:

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Understand the analytical methods of solving ordinary differential equations.	Understand
CO2	Apply the concept of ordinary differential equations to engineering problems.	Analyze
CO3	Apply Laplace transforms to solve linear ordinary differential equations and utilize properties such as shifting and convolution	Apply
CO4	Apply the concept of analytic functions in engineering problems	Apply
CO5	Evaluate complex integrals using Cauchy's integral theorem, residue theorem, and series expansions (Taylor and Laurent), and apply these methods to solve real integrals.	Apply

CO PO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	—	—	2	-	-	-	-	-	-	2	1
CO2	3	3	2	—	2	-	-	-	-	-	-	3	2
CO3	3	3	2	2	3	-	-	-	-	-	-	3	3
CO4	3	2	—	2	2	-	-	-	-	-	-	2	3
CO5	3	3	—	3	2	-	-	-	-	-	-	2	2

Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)

UNIT I 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 $e^{ax}\cos bx$

UNIT II APPLICATION OF ORDINARY DIFFERENTIAL EQUATIONS 9

Differential Equations with variable coefficients: Euler-Cauchy's equation – Method of variation of parameters – Applications of differential equations: Simple Harmonic Motion – Electric circuits

UNIT-III LAPLACE TRANSFORM 9

Existence conditions – Transforms of elementary functions – Transform of unit step function and unit impulse function – Basic properties – Shifting theorems – Initial and final value theorems- transform of periodic functions – Inverse transforms- partial fraction Method - convolution theorem.

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 – Taylor series – Laurent series – Cauchy's residue theorem (without proof)

Contact Periods:

Lecture: 45 Periods

Tutorial: 15 Periods

Practical: -

Total: 60 Periods**TEXT BOOKS:**

- 1.Higher Engineering Mathematics – B. S. Grewal, (2024–2025), Khanna Publishers.
- 2.Advanced Engineering Mathematics – H. K. Dass & Er. Rajnish Verma, (2023), S. Chand Publishing.
3. P. Kandasamy, K. Thilagavathi and K. Gunavathi, Engineering Mathematics, 4th Revised Edition, S. Chand & Company Ltd., New Delhi, 2001.

REFERENCES:

1. A Textbook of Engineering Mathematics – N. P. Bali & Manish Goyal, (2022/Latest Edition), Laxmi Publications.

2. Engineering Mathematics – S. Narayanan, T. K. Manicavachagom Pillay & G. Ramanaiah, (Latest Reprint), S. Viswanathan Publishers.

EVALUATION PATTERN:

Continuous Assessments			End Semester Examinations
CIAT 1	CIAT 2	Activities	
40%			60%
16(60)	16(60)	8(40)	60(100)

- Nil

- Understand the principles of photonics, including reflection, refraction, total internal reflection, air wedge, and laser fundamentals.
- Apply fibre optics to communication systems and sensor applications and explain the properties of semiconducting materials and devices.
- Explain the characteristics and applications of magnetic and dielectric materials used in data storage, sensing, and insulation.

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Describe the principles of photonics, including reflection, refraction, total internal reflection, air wedge, and laser fundamentals.	Understand
CO2	Apply the concepts of fibre optics in communication systems and sensor applications.	Apply
CO3	Explain the properties of semiconducting materials, including carrier concentration, transport mechanisms, and semiconductor devices.	Understand
CO4	Explain the characteristics and applications of magnetic materials used in data storage and sensing technologies.	Understand
CO5	Understand the basics of dielectric materials and insulation.	Understand

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	1	-	-	1	-	-	-	-	-	-	1	1
CO2	3	2	2	1	3	1	-	-	-	-	-	2	2
CO3	2	2	1	-	2	-	-	-	-	-	-	2	3
CO4	2	1	1	-	1	1	-	-	-	-	-	3	2
CO5	2	1	-	-	1	-	-	-	-	-	-	3	2
Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)													

2. "Engineering Physics", McGraw Hill Education India, 2022.

6

UNIT-II FIBRE OPTICS

6

UNIT-III SEMICONDUCTING MATERIALS

6

UNIT IV MAGNETIC MATERIALS

6

UNIT V DIELECTRIC MATERIALS

6

LIST OF EXPERIMENTS :

LIST OF EXPERIMENTS :

- ### Contact Periods:

Tutorial: -

Total: 60 Periods

1. M.N. Avadhanulu, P.G. Kshirsagar, and T.V.S. Arun Murthy, “A Textbook of Engineering Physics”, 11th edition, S. Chand Publishing, New Delhi, 2022.
2. "Engineering Physics", McGraw Hill Education India, 2022.

REFERENCES:

1. NPTEL, "Engineering Physics & Materials Science Courses", 2018–2025.
2. MIT Open Course Ware, "Materials Science and Optics Courses", 2018–2025.
3. NPTEL Courses on Engineering Physics, Semiconductor Physics, Energy Storage.
4. Coursera Courses on batteries, nanomaterials, and photonics.

EVALUATION PATTERN:

Continuous Assessments					End Semester Examinations
Theory			Practical / Project		Theory
CIAT 1	CIAT 2	Activities	Evaluation of Student's work, Observation, Record, etc.	Lab Test	
35%			15%		50%
15(60)	15(60)	5(40)	10(75)	5(25)	50(100)

U26EC201	CIRCUIT ANALYSIS	Category: PCC				
		L	T	P	J	C
		3	0	0	0	3

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

The course aims to:

- To learn the basic concepts and different methods of circuit analysis for DC and AC circuits
- To understand the concept of network theorems and transient response

To study the basic concepts of resonance circuits and two port network parameters

COURSE OUTCOME:

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Apply the basic concepts of circuit analysis such as Kirchoff's laws, mesh current and node voltage method for analysis of DC and AC circuits	Apply
CO2	Apply suitable network theorems and analyze AC and DC circuits	Apply
CO3	Analyze steady state response of any R, L and C circuits	Analyze
CO4	Analyze the transient response for any RC, RL and RLC circuits and frequency response of parallel and series resonance circuits	Analyze
CO5	Analyze the coupled circuits and network topologies	Analyze

CO PO MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	1	1	1	-	-	-	1	1	-	1	1
CO2	3	2	1	2	1	-	-	-	1	1	-	1	1
CO3	3	3	2	2	2	-	-	-	1	1	1	2	1
CO4	2	1	-	2	2	-	-	-	1	1	1	2	2
CO5	2	1	-	3	3	-	-	-	2	2	1	2	2
Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)													

SYLLABUS:**UNIT I CIRCUIT ANALYSIS**

Basic Components of electric Circuits, Charge, current, Voltage and Power, Voltage and Current Sources, Ohms Law, Kirchhoff 's Current Law, Kirchhoff 's voltage law, The single Node – Pair Circuit, series and Parallel Connected Independent Sources, Resistors in Series and Parallel, voltage and current division, Nodal analysis, Mesh analysis

UNIT II NETWORK THEOREM AND DUALITY

9

Useful Circuit Analysis techniques - Linearity and superposition, Thevenin and Norton Equivalent Circuits, Maximum Power Transfer, Delta-Wye Conversion. Duals, Dual circuits. Analysis using dependent current sources and voltage sources

UNIT III SINUSOIDAL STEADY STATE ANALYSIS

9 Sinusoidal Steady – State analysis, Characteristics of Sinusoids, The Complex Forcing Function, The Phasor, Phasor relationship for R, L, and C, impedance and Admittance, Nodal and Mesh Analysis, Phasor Diagrams, AC Circuit Power Analysis, Instantaneous Power, Average Power, apparent Power and Power Factor, Complex Power

UNIT IV TRANSIENTS AND RESONANCE IN RLC CIRCUITS

9

Basic RL and RC Circuits, The Source- Free RL Circuit, The Source-Free RC Circuit, The Unit-Step Function, Driven RL Circuits, Driven RC Circuits, RLC Circuits, Frequency Response, Parallel Resonance, Series Resonance, Quality Factor

UNIT V COUPLED CIRCUITS AND TOPOLOGY

9

Magnetically Coupled Circuits, mutual Inductance, the Linear Transformer, the Ideal Transformer, An introduction to Network Topology, Trees and General Nodal analysis, Links and Loop analysis.

Contact Periods:

Lecture: 45 Periods

Tutorial: –

Practical: -

Total: 45 Periods

TEXT BOOKS:

1. Hayt Jack Kemmerly, Steven Durbin, "Engineering Circuit Analysis", Mc Graw Hill education, 9th Edition, 2018.
2. Charles K. Alexander & Mathew N.O.Sadiku, "Fundamentals of Electric Circuits", Mc Graw- Hill, 2nd Edition, 2023.

REFERENCES:

1. John O Mallay, Schaum's Outlines "Basic Circuit Analysis", The Mc Graw Hill companies, 2nd Edition, 2011
 2. Allan H. Robbins, Wilhelm C. Miller, "Circuit Analysis Theory and Practice", Cengage Learning, Fifth Edition, 1st Indian Reprint 2013
 3. NPTEL course [Basic Electrical Circuits](#): IIT Madras Prof. Gajendranath Chowdary
- Boylestad, R. L. (2014). Introductory circuit analysis. Pearson Education India

EVALUATION PATTERN:

Continuous Assessments			End Semester Examinations
CIAT 1	CIAT 2	Activities	
40%			60%
16(60)	16(60)	8(40)	60(100)

- Nil

- Introduce the fundamentals of Python programming, syntax, data types and operators.
- Develop programming skills using control structures, functions, modules and packages.
- Apply Python data structures and file handling techniques to process engineering data.
- Introduce numerical computing and data visualization using NumPy, SciPy, Matplotlib and Pandas.
- Develop Python-based computational solutions for basic Electrical and Electronics Engineering applications.

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Explain the fundamental concepts, syntax, data types and operators of Python programming.	Understand
CO2	Develop Python programs using control structures, functions and modules to solve engineering problems	Apply
CO3	Apply Python data structures, file handling and exception handling techniques for processing engineering data	Apply
CO4	Utilize NumPy, SciPy, Matplotlib and Pandas for numerical computation, data analysis and visualization	Apply
CO5	Develop Python-based computational solutions for basic Electrical and Electronics Engineering applications	Apply

[illegible]

SYLLABUS:

UNIT I – PYTHON FUNDAMENTALS

9

Introduction to Python – Features and applications – Python interpreter and IDEs – Interactive and script modes – Syntax and indentation – Variables, constants, keywords and identifiers – Data types – Type conversion – Operators – Input and output statements – Comments – Basic debugging and error identification.

UNIT II – CONTROL STRUCTURES, FUNCTIONS AND MODULES

9

Conditional statements – if, if-else, nested if, elif ladder – Iterative statements – for and while loops – Nested loops – break, continue and pass – Functions – Arguments and return values – Default and keyword arguments – Lambda functions – Recursion – Modules and packages.

UNIT III – DATA STRUCTURES AND FILE HANDLING

9

Strings and string methods – Lists – Tuples – Sets – Dictionaries – Indexing and slicing – List comprehensions – Nested data structures – Searching and sorting – File handling – Text and CSV files – Exception handling.

UNIT IV – NUMERICAL COMPUTING AND DATA VISUALIZATION

9

NumPy arrays – Array creation and manipulation – Vectorized operations – Mathematical functions – Matrix operations – Introduction to SciPy – Numerical computation – Matplotlib – Line, bar and scatter plots – Multiple plots – Labelling and visualization of engineering data.

UNIT V – PYTHON APPLICATIONS IN ELECTRICAL ENGINEERING

9

Python for electrical engineering calculations – DC and AC circuit calculations – Power and energy calculations – Transformer performance calculations – Electrical machine data analysis – Signal generation and analysis – Introduction to Pandas – Engineering data analysis – Visualization – Mini-project development.

LABORATORY – PYTHON PROGRAMMING AND ITS APPLICATIONS

1. Basic Python programming: input/output, operators and type conversion.
2. Programs using conditional and looping statements.
3. Functions, recursion and lambda functions.
4. Python module/package for electrical engineering calculations.
5. Power, energy and power-factor calculations.
6. Transformer performance and efficiency analysis.
7. Electrical machine performance/data analysis.
8. Mini-project: Python application related to an Electrical and Electronics Engineering **problem**.

Contact Periods:

Lecture: 45 Periods

Tutorial: –

Practical: 30 Periods

Total: 75 Periods**TEXT BOOKS:**

1. Mark Lutz, Learning Python, O'Reilly Media.
2. Eric Matthes, Python Crash Course, No Starch Press.
3. Charles Severance, Python for Everybody, CreateSpace.

REFERENCES:

1. John V. Guttag, Introduction to Computation and Programming Using Python, MIT Press.
2. Wes McKinney, Python for Data Analysis, O'Reilly Media.
3. Allen B. Downey, Think Python, O'Reilly Media.
4. Hans Petter Langtangen, A Primer on Scientific Programming with Python, Springer.

SOFTWARE REQUIREMENTS:

Python 3.x, Jupyter Notebook / Google Colab, NumPy, SciPy, Matplotlib and Pandas.

EVALUATION PATTERN:

Continuous Assessments					End Semester Examinations
Theory			Practical / Project		Theory
CIAT 1	CIAT 2	Activities	Evaluation of Student's work, Observation, Record, etc.	Lab Test	
35%			15%		50%
15(60)	15(60)	5(40)	10(75)	5(25)	50(100)

U26EC202	PRINCIPLES OF COMMUNICATION SYSTEMS	Category: PCC				
		L	T	P	J	C
		3	0	0	0	3

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

- To introduce Analog Modulation Schemes
- To impart knowledge in random process
- To study various Digital techniques
- To introduce the importance of sampling & quantization
- To impart knowledge in demodulation techniques

To enhance the classroom teaching using smart connectivity instruments

COURSE OUTCOMES:

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Gain knowledge in amplitude modulation techniques	Remember
CO2	Understand the concepts of Random Process to the design of communication systems	Understand
CO3	Gain knowledge in digital techniques	Remember
CO4	Gain knowledge in sampling and quantization	Remember
CO5	Understand the importance of demodulation techniques	Understand

CO PO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	1	-	2	-	-	-	-	1	-	2	2
CO2	2	3	2	2	3	-	-	-	1	1	-	3	3
CO3	2	3	3	2	3	-	-	-	1	1	-	3	3
CO4	3	3	3	2	3	-	-	-	2	1	1	3	3
CO5	3	3	3	2	3	-	-	-	2	2	1	3	3
Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)													

SYLLABUS:**UNIT I AMPLITUDE MODULATION****9**

Review of signals and systems, Time and Frequency domain representation of signals, Principles of Amplitude Modulation Systems-DSB, SS Band VSB modulations. Angle Modulation, Representation of FM and PM signals, Spectral characteristics of angle modulated signals. SSB Generation – Filter and Phase Shift Methods, VSB Generation – Filter Method, Hilbert Transform, Pre-envelope & complex envelope AM techniques, Super heterodyne Receiver.

UNIT II RANDOM PROCESS & SAMPLING**9**

Review of probability and random process. Gaussian and white noise characteristics, Noise in amplitude modulation systems, Noise in Frequency modulation systems. Pre-emphasis and De-emphasis, Threshold effect in angle modulation. Low pass sampling – Aliasing- Signal Reconstruction-Quantization - Uniform & non-uniform quantization - quantization noise - Nyquist criterion- Logarithmic Companding –PAM, PPM, PWM

UNIT III DIGITAL TECHNIQUES**9**

UN Pulse modulation Differential pulse code modulation. Delta modulation, Noise considerations in PCM,, Digital Multiplexers, Channel coding theorem - Linear Block codes - Hamming codes - Cyclic codes - Convolutional codes - Viterbi Decoder

UNIT IV DIGITAL MODULATION SCHEME**9**

Geometric Representation of signals - Generation, detection, IQ representation, PSD & BER of

Coherent BPSK, BFSK, & QPSK - QAM - Carrier Synchronization - Structure of Non-coherent Receivers Synchronization and Carrier Recovery for Digital modulation, Spectrum Analysis – Occupied bandwidth – Adjacent channel power

UNIT V DEMODULATION TECHNIQUES

9

Elements of Detection Theory, Optimum detection of signals in noise, Coherent communication with waveforms- Probability of Error evaluations. Baseband Pulse Transmission- Inter symbol Interference, Optimum demodulation of digital signals over band-limited channel

Contact Periods:

Lecture: 45 Periods

Tutorial: –

Practical: 30 Periods

Total: 45 Periods

TEXT BOOKS:

1. Marcelo S. Alencar & Valdemar C. da Rocha Jr. Communication Systems, 3rd Edition, Springer, 2022
2. Todor Cooklev & Andrew E. Yagle Modern Communications Systems: A First Course, Michigan Publishing, 2024

REFERENCES:

1. Jean-Michel Friedt & Hervé Boeglen Communication Systems Engineering with GNU Radio, Wiley, 2024
2. Digital Communications: Introduction to Communication Systems,
3. Marcelo S. Alencar et al. Communication Systems, 2nd Edition, Springer, 20203.

EVALUATION PATTERN:

Continuous Assessments			End Semester Examinations
CIAT 1	CIAT 2	Activities	
40%			60%
16(60)	16(60)	8(40)	60(100)

U26EC211	ELECTRON DEVICES	Category: ESC				
		L	T	P	J	C
		3	0	2	0	4

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

- Understand the construction, theory, and operation of basic electronic devices.
- Analyze the behavior of semiconductors, including carrier motion, energy bands, and temperature effects.
- Learn the characteristics and applications of diodes, BJTs, FETs, and thyristors.
- Explore optoelectronic devices like LEDs, LCDs, photodiodes, and optocouplers.

Develop practical skills through experiments, demonstrations, and circuit design for electronic

COURSE OUTCOMES:

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Explain the structure and working operation of basic electronic devices.	Understand
CO2	Design and analyze amplifiers	Apply
CO3	Analyze frequency response of BJT and MOSFET amplifiers	Apply
CO4	Design and analyze feedback amplifiers and oscillator principles	Apply
CO5	Design and analyze power amplifiers and supply circuits	Apply

CO PO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	1	-	-	-	-	-	-	-	-	1	3	1
CO2	3	2	1	1	-	-	-	2	2	-	1	3	2
CO3	3	2	1	1	-	-	-	2	2	-	1	3	2
CO4	3	2	1	1	1	-	-	2	2	-	1	3	2
CO5	3	3	2	2	2	-	-	2	2	-	1	3	2
Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)													

SYLLABUS:**UNIT I SEMICONDUCTOR****9**

Types, Conductivity, Electron energy levels and energy band diagram, Carrier concentration, Mass action law, Characteristics and behavior of intrinsic semiconductors, Variation in properties with temperature, Carrier drift and diffusion, Current density equation, Excess carrier generation and recombination rates, Carrier life time. Continuity equation

UNIT II DIODE**9**

PN Junction Diodes: Energy band diagram of open – circuited PN junction, Forward and reverse bias characteristics, Diode resistance, Transition and diffusion capacitance, Effect of temperature on diode behavior, Applications of PN junction diodes. Special Diodes: Zener diode – breakdown mechanisms and voltage regulation, Varactor diode, Tunnel diode, Photo diode – construction, operation, and applications.

UNIT III BIPOLAR JUNCTION TRANSISTORS**9**

Construction, working, characteristics in CB, CE, and CC configurations, regions of operation, current gain, input/output characteristics, Early effect. Other Devices: Multi-emitter transistor – construction and applications.

UNIT IV FIELD EFFECT TRANSISTORS**9**

JFET – construction, working, characteristics, parameters. MOSFET, MOS capacitor, depletion and enhancement modes, nMOS and pMOS, threshold voltage, transfer and output characteristics. CMOS – introduction and basic operation.

UNIT V OPTO ELECTRONIC DEVICES**9**

LED, LCD, Photo transistor, Opto-coupler – principle, characteristics and applications. Power MOSFETs: Construction, switching characteristics and applications in power circuits

LIST OF EXPERIMENTS

1. VI characteristics of PN diode and Zener diode
2. Applications of PN diode
3. Characteristics of BJT and JFET
4. Frequency response of CE and CS amplifiers using simulation tool
5. Design of wave shaping circuits using simulation tool
6. Design of DC regulator power supply using simulation tool
7. Characteristics of MOSFET using simulation tool

Contact Periods:

Lecture: 45 Periods

Tutorial: –

Practical: 30 Periods

Total: 75 Periods**TEXT BOOKS:**

1. Corrado Di Natale – Introduction to Electronic Devices, Springer, 2023
2. Christoper Siu- Electronic Devices, Circuits, and Applications, Springer, 2022

REFERENCES:

1. George Domingo – Semiconductor Basics, Wiley, 2020
2. Suman Lata Tripathi (Ed.) – Recent Advancement in Electronic Devices, Circuit and Materials, 2020
3. Fabrizio Roccaforte et al. – Nitride Semiconductor Technology, Wiley, 2020

EVALUATION PATTERN:

Continuous Assessments					End Semester Examinations
Theory			Practical / Project		Theory
CIAT 1	CIAT 2	Activities	Evaluation of Student's work, Observation, Record, etc.	Lab Test	
35 %			15 %		50%
15(60)	15(60)	5(40)	10(75)	5(25)	50(100)

U26CEC01	DESIGN THINKING	Category: PCC				
		L	T	P	J	C
		1	0	2	0	2

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

- To introduce the fundamental principles, mindset, and phases of Design Thinking for problem-solving.
- To develop the ability to understand user needs through empathy-driven research methods.
- To enable students to apply creative ideation and experimentation techniques for innovative solutions.
- To equip learners with skills to engage stakeholders and communicate ideas effectively.
- To provide knowledge on evaluating, refining, and implementing solutions using strategic and analytical tools.

COURSE OUTCOMES:

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Explain the principles, phases, and tools of Design Thinking and apply them to real-world problems	Understand
CO2	Apply empathy-based techniques such as field observation, interviews, and persona development to identify user needs	Apply
CO3	Generate innovative ideas using ideation techniques like SCAMPER and develop prototypes.	Apply
CO4	Demonstrate effective communication through storytelling, storyboarding, and user engagement methods	Apply
CO5	Analyze and evaluate solutions using strategic tools such as viability analysis, activity systems, and innovation frameworks	Analyze

CO PO MAPPING

[illegible]

SYLLABUS:

UNIT I DESIGN THINKING 3

Key Principles and Mindset – Five Phases, Methods and Tools of Design Thinking – User Guide – Foundation Building for Design Thinking – Explore: Methods & Tools – STEEP Analysis – Strategic Priorities – Activity System – Stakeholder Mapping – Opportunity Framing.

UNIT II EMPATHIZE: 3

Methods & Tools – Field Observation – Deep User Interview – Empathy Map – User Journey Map - Need Finding – User Insights - User Persona Development.

UNIT III EXPERIMENT 3

Methods & Tools – Ideation – SCAMPER – Analogous Inspiration – Deconstruct & Reconstruct – User Experience Journey – Prototyping– Idea Refinement.

UNIT IV ENGAGE 3

Methods & Tools – Story Telling – Art of Story Telling – Storyboarding – Co-Creation with Users – Collect Feedback from Users.

UNIT V EVOLVE 3

Methods & Tools – Concept Synthesis – Strategic Requirements – Evolved Activity Systems – Activity System Integration – Viability Analysis – Innovation Tools using User Needs, CAP, 4S – Change Management - Quick Wins.

LIST OF EXPERIMENTS / PRACTICAL EXERCISES

1. Study and analysis of a real-world problem using STEEP Analysis.
2. Perform Stakeholder Mapping for a selected case study.
3. Develop an Activity System Map for an existing product/service.
4. Conduct Field Observation and document findings.
5. Perform a Deep User Interview and analyze responses.
6. Create an Empathy Map based on collected data.
7. Generate ideas using Brainstorming and SCAMPER techniques.
8. Apply Analogous Inspiration for innovative thinking.
9. Perform Deconstruct & Reconstruct exercise on an existing product.
10. Develop a Storytelling script for a design solution.
11. Create a Storyboard representing the user experience.
12. Conduct Co-creation sessions with users.
13. Perform Concept Synthesis for final solution design.
14. Define Strategic Requirements for implementation.

15. Develop an Evolved Activity System.

Contact Periods:

Lecture: 15 Periods

Tutorial: -

Practical: 30 Periods

Total: 45 Periods

EVALUATION PATTERN:

Continuous Assessments					End Semester Examinations	
Theory			Practical / Project		Practical	
CIAT 1	CIAT 2	Activities	Evaluation of Student's work, Observation Record, etc.	Lab Test	Test / Report Evaluation	Presentat ion & Viva
25%			25 %		50%	
10(30)	10(30)	5(40)	15(75)	10(25)	40(80)	10(20)

U26MC201	UNIVERSAL HUMAN VALUES - II	Category: MCC				
		L	T	P	J	C
		3	0	0	0	3

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

- To facilitate the development of a holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the human reality and the rest of existence.
- To highlight plausible implications of such a holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature.

COURSE OUTCOMES:

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	Evaluate the significance of value inputs in formal education and start applying them in life and profession.	Understand
CO2	Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.	Understand
CO3	Analyze the value of harmonious relationships based on trust and respect in life and profession.	Understand
CO4	Examine the role of a human being in ensuring harmony in society and nature	Understand
CO5	Apply the understanding of ethical conduct to formulate strategies for ethical life and profession	Understand

CO PO MAPPING:

[illegible]

SYLLABUS:

UNIT I INTRODUCTION – BASIC HUMAN ASPIRATION, ITS FULFILLMENT THROUGH ALL ENCOMPASSING RESOLUTION 9

The basic human aspirations and their fulfillment through Right Understanding and Resolution Right understanding and Resolution as the activities of the Self (self being central to Human Existence) – All encompassing Resolution for a Human Being – Its details and solution of problems in the light of Resolution.

UNIT II RIGHT UNDERSTANDING – KNOWER, KNOWN & THE PROCESS 9

The domain of right understanding starting from understanding the human being and extending up to understanding nature/existence – its interconnectedness and co-existence – and finally understanding the role of human being in existence (human conduct).

UNIT III UNDERSTANDING HUMAN BEING 9

Understanding the human being comprehensively as the first step and the core theme of this course – Human being as co-existence of the self and the body – The activities and potentialities of the self – basis for harmony/contradiction in the self.

UNIT IV UNDERSTANDING NATURE AND EXISTENCE 9

A comprehensive understanding about the existence – Nature being included – The need and process of inner evolution – Particularly awakening to activities of the Self: Realization – Understanding and Contemplation in the Self.

UNIT V UNDERSTANDING HUMAN CONDUCT, ALL-ENCOMPASSING RESOLUTION & HOLISTIC WAY OF LIVING 9

Understanding Human Conduct – Different aspects of all encompassing Resolution – Holistic way of living for Human Being with all encompassing resolution covering all four dimensions of human endeavor viz., realization, thought, behavior and work leading to harmony at all levels from Self to Nature and entire Existence.

Contact Periods:

Lecture: 45 Periods

Tutorial: -

Practical:-

Total: 45 Periods

TEXTBOOKS:

1. R R Gaur, R Asthana, G P Bagaria, A Foundation Course in Human Values and Professional Ethics, 2nd Revised Edition, Excel Books, New Delhi, 2019.

REFERENCES:

1. E G Seebauer & Robert L. Berry, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press, 2000.
2. M Govindarajan, S Natrajan & V.S. Senthil Kumar, Engineering Ethics (Including

Human Values), Eastern Economy Edition, Prentice Hall of India Ltd.

3. B P Banerjee, Foundations of Ethics and Management, Excel Books, 2005.

4. B L Bajpai, Indian Ethos and Modern Management, New Royal Book Co., Lucknow, Reprinted 2008.

EVALUATION PATTERN:

Continuous Internal Assessments	
Assessment 1 (100 Marks)	
Total	100

SYLLABUS:

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 beads - 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.

Contact Periods:

Lecture: 15 Periods

Tutorial: --

Practical: -

Total: 15 Periods

TEXT BOOKS:

1. Tamils and Technology, K. Jayanthi Ravikrishna, Sri Krishna publications, Mahalakshmi Nagar, Velappanchavadi, Chennai - 600 007, First Edition 2023.
2. Tamils and Technology, S. Priyadarshini, V. K. Publications, 55, Gopuram Colony, Sivakasi - 626 124.

REFERENCES:

1. History of Tamil Nadu – People and Culture – K.K. Pillai, International Institute of Tamil Studies, C.P.T Campus, Chennai.
2. Computer Tamil – Dr. Il. Sundaram, Vikatan Publications, Anna Salai, Chennai, December 2016.

U26TA201	தமிழரும் தொழில் நுட்பமும் Tamils and Technology (Common to all programmes)	Category: MCC				
		L	T	P	J	C
		1	0	0	0	1

PRE-REQUISITES:

- Nil

COURSE OBJECTIVES:

- தமிழர்களின் நெய்தல்,மண் பாண்டம் மற்றும் கட்டிடத் தொழில் நுட்பங்களை அறிதல்.
- தமிழர்களின் வேளாண்மை, பாசன மற்றும் உற்பத்தித் தொழில் நுட்பங்களை புரிதல்.
- அறிவியல் தமிழ் மற்றும் தமிழ் கணினி வளர்ச்சியை உணர்தல்.

COURSE OUTCOMES:

On completion of the course, the students will be able to		BT Mapped (Highest Level)
CO1	பண்டைய தமிழர்களின் நெய்தல் மற்றும் மண்பாண்டத் தொழில் நுட்பத்தை புரிதல்	Understand
CO2	சங்ககால கட்டிடத் தொழில்நுட்பம், கட்டிடப் பொருட்கள் மற்றும் சம்பவ ஆய்வுகளை புரிதல்	Understand
CO3	உலோக செயல்முறை, நாணயம் மற்றும் மணிகள் தயாரிப்பை தொல்பொருள் ஆதாரங்களுடன் விளக்கமாக அறிதல்	Understand
CO4	வேளாண்மை முறைகள், பாசனத் தொழில்நுட்பம் மற்றும் முத்துப் பிடித்தலை உணர்தல்	Understand
CO5	அறிவியல் தமிழ் மற்றும் தமிழ் கணினி அறிவை பயன்படுத்துதல்	Understand

CO PO MAPPING

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

Correlation Levels; 1.Slight (low) 2. Moderate (Medium) 3. Substantial (High)

SYLLABUS:

- UNIT I நெசவுமற்றும்பாணைதொழில்நுட்பம் 3**
சங்க காலத்தில் நெசவுத் தொழில் பாணை தொழில் நுட்பம்- கருப்பு சிவப்பு பாண்டங்கள் பாண்டங்களில் கீறல் குறியீடுகள்.
- UNIT II மரபு-பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை- சிற்பக்கலை 3**
சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் சங்ககாலத்தில் வீட்டு பொருட்களில் வடிவமைப்பு சங்க காலத்தில் கட்டுமான பொருட்களும் நடுக்கல்லும் சிலப்பதிகாரத்தில் மேடைவடிவமைப்பு பற்றிய விவரங்கள் மாமல்லபுரம் கோவில்கள் சிற்பங்களும் கோவில்களும் சோழர் காலத்தில் சோழர் காலத்துப் பெருங் கோவில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் நாயக்கர் கால கோவில்கள் மாதிரி கட்டமைப்புகள் பற்றி அறிதல் மீனாட்சியம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் செட்டி நாட்டு வீடுகள் பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோசாராசெனிக் கட்டிடக்கலை.
- UNIT III உற்பத்தித்தொழில்நுட்பம் 3**
கப்பல் கட்டும் கலை -உலோகவியல் இரும்புதொழிற்சாலை -இரும்பு உருக்குதல் -எஃகு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள்- நாணயங்கள் அச்சடித்தல் - மணிஉருவாக்குதல் -தொழிற் சாலைகள்- கல்மணிகள் கண்ணாடி மணிகள் சுடுமண் மணிகள் சங்குமணிகள் -எலும்புதுண்டுகள் -தொல்லியல் சான்றுகள்-சிலப்பதிகாரத்தில் மணிகளின் வகைகள்
- UNIT IV வேளாண்மை மற்றும்நீர் பாசன தொழில்நுட்பம் 3**
அனை,ஏரி, குளங்கள், மதகு - சோழர் கால குமிழித்தூம்பின் முக்கியத்துவம்- கால்நடை பராமரிப்பு -கால் நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள்- வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள் - கடல் சார்ந்த அறிவு மீன்வளம் -முத்து மற்றும் முத்துகுளித்தல் -பெருங்கடல் குறித்து பண்ணைய -அறிவுசார் சமூகம்.
- UNIT V அறிவியல் தமிழ் மற்றும் கணிதத் தமிழ் 3**
அறிவியல் தமிழின் வளர்ச்சி -கணித தமிழ் வளர்ச்சி -தமிழ் நூல்களை மின்பதிப்பு செய்தல்- தமிழ் மென் பொருட்கள் உருவாக்கம் - தமிழ் இணைய கல்விக் கழகம்- தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள்-சொற்குவைத் திட்டம்.

Contact Periods:

Lecture: 15 Periods

Tutorial: --

Practical: -

Total: 15 Periods

TEXT BOOKS:

1. கே. ஜெயந்தி ரவிகிருஷ்ணா, தமிழர்கள் மற்றும் தொழில்நுட்பம், ஸ்ரீ கிருஷ்ணா பதிப்பகம், மகாலட்சுமி நகர், வேலப்பஞ்சாவடி, சென்னை-600 007, முதல்பதிப்பு, 2023..
2. எஸ். பிரியதர்ஷினி, தமிழர்கள் மற்றும் தொழில் நுட்பம், வி. கே. பதிப்பகம், 55, கோபுரம் காலனி, சிவகாசி-626 124.

REFERENCES:

3. தமிழக வரலாறு – மக்களும் பண்பாடும் - கே.கே. பிள்ளை, International Institute of Tamil Studies, C.P.T Campus, Chennai.
4. கணினித் தமிழ் - முனைவர். இல. சுந்தரம், விகடன் பிரசுரம், அண்ணாசாலை, சென்னை, திசம்பர் 2016.

EVALUATION PATTERN:

Continuous Internal Assessments	
Assessment 1 (100 Marks)	
Total	100