



Shree Sathyam
College of Engineering and Technology
(An Autonomous Institution)



*Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.
Accredited with NAAC (B++) & Recognized under Section 2(f) of UGC
NH-544 Salem – Kochi Highway, Sankari, Salem (DT) - 637301.*

**Department of Electronics and
Communication Engineering**

Under Graduate- R2026

I – Year

Syllabus

SEMESTER - I

U26SHEN11	Professional English for Engineers - I (Common to AI&DS, BME, CSE, IT, ECE, EEE, MECH)	L	T	P	S	C
Nature of the Course	Basic English Communication Skills (LSRW)	2	0	0	0	2
Pre – Requisites	Ability to read and understand English					

Course Objectives:

The course is intended to

1. Enhance learners' listening skills for academic and technical contexts and enable them to comprehend lectures, instructions, and technical discussions.
2. Develop effective speaking skills for self-expression, technical presentations, and collaborative engineering tasks.
3. Strengthen reading skills for comprehending technical texts, manuals, and research articles using appropriate strategies.
4. Equip students with writing skills for technical coherence, precision, and documentation relevant to engineering.
5. Build a strong foundation in grammar and technical vocabulary for academic and professional communication.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Understand	Demonstrate effective listening and note-taking skills for academic lectures and technical instructions.	PO1(2), PO10(2)	
CO 2	Apply	Utilize appropriate vocabulary and grammatical structures to communicate in technical and general engineering contexts.	PO1(3)	
CO 3	Understand	Interpret technical texts using appropriate reading strategies and infer contextual meaning.	PO2(2)	
CO 4	Understand	Illustrate thoughts, technical ideas and project description effectively in real life and professional situations.	PO9(2), PO10(3)	
CO 5	Apply	Organize information for engineering documentation and presentations.	PO11(1)	

Modules

Module – I	Foundation of Technical Communication	L	T	S
		6	0	0
Listening Skills: Listening to Simple Conversations - Understanding tone and intent (Academic Context) Note-taking Strategies for Lectures and Technical Talks Speaking Skills: Self-Introduction - Academic and Professional Context /Describing Everyday Objects, Laboratory Equipment and Processes - Technical Description Reading Skills: Reading Strategies - Skimming, Scanning, Predicting /Reading Short Technical Passages and User Manuals - Intensive Reading Writing Skills: Sentence Formation and Sentence Structure – Coherence /Guided Writing - Hints Development and Paragraph Development (Technical) Grammar & Vocabulary: • Grammar: Parts of Speech - Detailed Study with Technical Examples • Grammar: Tenses - Present Tenses (all four) and Past Tenses (all four) with engineering contexts • Vocabulary: Match the Following - Basic Vocabulary & Technical Word Building				

Module – II	Technical Listening and Oral Communication	L	T	S
		6	0	0
Listening Skills: Listening to Short Speeches / Stories - Technical Talks and TED Talks /Active Listening in Team Discussions and Extracting Key Technical Information Speaking Skills: Just a Minute (JAM) - Technical Topics and Video Recording for Self-Assessment/Situational Role Plays - Engineering Scenarios (Client Meeting, Lab Discussion) Reading Skills: Reading Newspaper and Digital Articles - Science and Technology/Reading Comprehension - Data Interpretation from Graphs, Charts, and Technical Reports Writing Skills: Picture and Poster Description - Technical Diagrams and Flowcharts /Descriptive Paragraphs - Process Description (e.g., Working of a Device) Grammar & Vocabulary: - Grammar: Phrasal Verbs Commonly Used in Engineering - Vocabulary: Engineering Vocabulary - Core Technical Terms - Grammar: Tenses - Future Tenses (all four) - Grammar: Mixed Tenses - Application in Technical Contexts				
Module – III	Analytical Reading and Technical Writing	L	T	S
		6	0	0
Listening Skills: Listening to Pronunciation - Word Stress, Sentence Stress for Technical Terms / Listening to Academic Lectures and Summarizing Speaking Skills: Expressing Opinions and Technical Arguments with Justification / Participating in Group Discussions and Brainstorming for Engineering Problems Reading Skills: Intensive Reading - Long Passages on Engineering Themes (Sustainability, Innovation) / Note Making and Summarizing Technical Articles Writing Skills: Error Detection and Sentence Correction in Technical Documents / Narrative and Comparative Paragraphs - Technical Comparison (e.g., Renewable vs Non-renewable) Grammar & Vocabulary: - Grammar: Voice - Active Voice, Passive Voice and Impersonal Passive Voice (for technical writing) - Vocabulary: Idioms and Phrases Relevant to Academic and Workplace Contexts				
Module – IV	Professional Communication Skills	L	T	S
		6	0	0
Listening Skills: Listening to Various Accents - Global English for Engineering Communication / Listening to Instructions and Following Lab Protocols Speaking Skills: Spell Bee and Word Substitution - Technical Spellings and Terminology / Usage of Communication Apps and Tools for Virtual Presentations Reading Skills: Cloze Tests and Gap Fill Exercises with Technical Vocabulary / Reading and Interpreting Standard Operating Procedures (SOPs) Writing Skills: Brainstorming and Mind Mapping for Project Ideas /Informal Letters / Emails Reframed as Formal Technical Emails and Job Application Emails Grammar & Vocabulary: - Grammar: Degrees of Comparison - Comparative Structures for Technical Analysis - Grammar: Direct and Indirect Speech - Reporting Technical Findings - Vocabulary: Homophones & Homonyms - Common Errors in Technical Writing				
Module – V	Advanced Technical English and Documentation	L	T	S
		6	0	0
Listening Skills: Listening to Technical Presentations and Evaluating Content / Listening and Repeating - Shadowing Technique for Fluency Speaking Skills: Technical Presentation Skills - Mini Project Presentation / Mock Interviews and Professional Etiquette for Engineers Reading Skills: Reading Research Abstracts and Case Studies - Critical Reading / Digital Reading Strategies - E-Resources and Technical Blogs Writing Skills: Writing Different Types of Paragraphs - Technical Reports and Abstract Writing / Letter Writing - Formal Letters: Requisition, Complaint, and Permission Letters in Engineering Context Grammar & Vocabulary: - Grammar: Subject-Verb Agreement - Detailed Rules and Application (Moved to Unit V as required) - Grammar & Vocabulary: Cloze Test - Integrated Grammar and Vocabulary Assessment				

Text Books:

1. Miller, K. Q., & Wahl, S. T. (2023). Business and Professional Communication: KEYS for Workplace Excellence (5th ed.). SAGE Publications.
2. Praveen Sam, D. & Shoba, K.N. (2020). A Course in Technical English. Cambridge University Press, New Delhi, India. (ISBN: 978-93-86712-65-0)
3. Kumar, Sanjay & Pushpalatha. (2018). English Language and Communication Skills for Engineers. India: Oxford University Press.

Reference Books:

1. Sudharshana, N.P. & Savitha, C. (2018). English for Engineers. Cambridge University Press.
2. Meenakshi Raman & Sangeeta Sharma (2015). Technical Communication – Principles and Practice. Oxford University Press, New Delhi.
3. Michael Swan (2016). Practical English Usage. Oxford University Press.

E- Resources:

1. Cambridge English – <https://www.cambridgeenglish.org/learning-english/grammar-and-vocabulary/>
2. Perfect English Grammar – <https://www.perfect-english-grammar.com/>
3. British Council – Learn English - <https://learnenglish.britishcouncil.org/grammar>
4. Speechling – <https://speechling.com/>
5. Mepro by Pearson – <https://mepro.pearson.com/>
6. TED Talks – <https://www.ted.com/>

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Understand	Quiz	5	10
Apply	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Continuous Internal Assessment		End Semester Examination
	CIA - I	CIA - II	
Remember			
Understand	20	20	40
Apply	30	30	60
Analyze			
Evaluate			
Create			

U26SHMA11	Calculus for Engineers (Common to AI&DS, BME, CSE, ECE, EEE, IT, MECH)	L	T	P	S	C
Nature of the Course	Basic Science	3	1	0	-	4
Pre – Requisites	Basic mathematics related to Differentiation and Integration.					

Course Objectives:

The course is intended to

1. Recall the fundamental concepts of limits, continuity, differentiation, and integration of functions of one and several variables.
2. Understand differential calculus to analyze the behavior of functions, including maxima, minima, and rate-of-change problems in engineering applications.
3. Apply proficiency in techniques of integration and use definite and improper integrals to solve engineering-related problems.
4. Apply partial differentiation and total derivatives to analyze multivariable functions and solve optimization problems.
5. Apply multiple integrals, vector calculus, and related mathematical tools to model and solve engineering problems.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Remember	Recall the fundamental concepts of limits, continuity, differentiation, integration and vector calculus.	PO1(3)	
CO 2	Understand	Explain the concepts and principles of differential and integral calculus and their geometric and physical interpretations.	PO1(3)	
CO 3	Apply	Apply differential and partial differential techniques to solve problems involving maxima, minima, rate of change and functions of several variable.	PO2(3)	
CO 4	Apply	Apply integration techniques and multiple integrals to determine areas, volumes, arc lengths and other engineering related problems.	PO2(3)	
CO 5	Apply	Apply vector calculus concepts and Green's, Gauss's and Stoke's theorem to solve line, surface, and volume integral problems.	PO5(2) PO11(1)	

Modules

Module – I	Differential Calculus	L	T	S
		9	3	0
Functions, graph of functions, New functions from old functions, Limit of a function, Continuity, Limits at infinity, Derivative as a function, Maxima and Minima of functions of single variable, Mean value theorem, Effect of derivatives on the shape of a graph. Activities: Visualization of the functions, calculating Maxima and Minima of a function Using Geogebra				
Module – II	Functions of Several Variables	L	T	S
		9	3	0
Partial derivatives, Chain rule, Total derivative,Taylor's series for function of two variables, Maxima and minima of functions of two variables, Method of Lagrange's Multipliers, Application problems in engineering. Activities: Partial Derivatives with two or three variables, Maxima and Minima of a function using Geogebra.				

Module – III	Integral Calculus	L	T	S
		9	3	0
Fundamental theorem of Calculus, Indefinite integrals and the Net Change Theorem, Improper integrals, Arc Length, Area of Region, Area of surface of revolution. Activities: Calculating Definite and Indefinite Integrals, Determination of Area, Using Geogebra.				
Module – IV	Multiple Integrals	L	T	S
		9	3	0
Iterated integrals and Fubini’s theorem, Evaluation of double integrals, change of order of integration, change of variables between Cartesian and polar co-ordinates, evaluation of triple integrals-change of variables between Cartesian and cylindrical and spherical co-ordinates. Activities: Calculating Double integrals and triple integrals using Geogebra				
Module – V	Vector Calculus	L	T	S
		9	3	0
Gradient and directional derivative of a scalar field, divergence and curl of a vector field. Integration of vector field – line integrals, path independence of line integrals, Green’s theorem in the plane, Gauss’s divergence theorem, and Stokes’s theorem. Activities: Evaluation of divergence, curl, line integrals, and surface integrals; Visualization of vector fields and gradients using Geogebra.				
Text Books: 1. Calculus: Early transcendentals. Stewart, J., Clegg, D., & Watson, S. Cengage. (2023). 9TH Edition 2. Thomas' calculus: Early transcendentals. Thomas, G. B., Jr., Weir, M. D., Hass, J., & Heil, C.Pearson. (2018) 3. Vector calculus .J. E. Marsden and A. Tromba, W H Freeman & Co. (2011) 6th Edition				
Reference Books: 1. Calculus: Early transcendentals. Anton, H., Bivens, I. C., & Davis, S.). John Wiley & Sons (2021). 2. Calculus: an Applied Approach. Ron Larson and David C. Falvo, (2013).Cengage . (2013).				
E- Resources: 1. Map: Calculus - Early Transcendentals (Stewart) - Mathematics LibreTexts 2. Calculus II 3. GeoGebra - the world’s favorite, free math tools used by over 100 million students and teachers				

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Internal Assessment Examinations		End Semester Examination
	CIA - I	CIA - II	
Remember	15	10	25
Understand	15	10	25
Apply	20	30	50
Analyze			
Evaluate			
Create			

U26SHPH11	Engineering Physics - I (Common to AI&DS, BME, CSE, IT, ECE, EEE, MECH)	L	T	P	S	C
Nature of the Course	Basic Sciences	3	0	0	-	3
Pre – Requisites	Basic Physics					

Course Objectives:

The course is intended to

1. To understand mechanical properties of materials and their practical applications in structures like bridges and buildings.
2. To analyze oscillatory and wave phenomena including damped/forced oscillations and energy transfer in waves.
3. To explain the wave-particle duality and fundamental postulates of quantum mechanics.
4. To describe optical phenomena, light propagation in fibers, and laser operation principles.
5. To explain Maxwell's equations, EM wave generation, and practical applications like cell phone reception.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Remember	Recall the fundamental principles of elasticity, viscosity, and surface tension and their role in material properties.	PO1(3)	
CO 2	Remember	Identify the characteristics of simple harmonic motion, torsional oscillations, and wave propagation on a stretched string	PO1(3)	
CO 3	Remember	Interpret the concepts of quantum mechanics, including the photoelectric effect, de Broglie hypothesis, and Schrödinger wave equation.	PO1(3)	
CO 4	Understand	Discuss the principles of interference, fiber optics, and the working of various lasers (Nd:YAG, CO ₂ , Dye).	PO1(3), PO2(2)	
CO 5	Understand	Illustrate the production and propagation of electromagnetic waves and their application in modern communication systems.	PO1(3), PO4(1)	

Modules

Module - I	Properties of Matter	L	T	S
		9	0	0
Elasticity, Cantilever, Young's modulus: Uniform & Non-uniform bending, Girders: Bridges and buildings, Viscosity: Stokes method, Surface tension: drop weight method, Thermal expansion, Thermal stress, Bimetallic strips, Expansion joints				
Module – II	Oscillations	L	T	S
		9	0	0
Simple Harmonic motion, Torsional pendulum, Couple per unit twist, Damped and Forced Oscillation				
Module – III	Waves	L	T	S
		9	0	0
Waves on a stretched string, Energy and Power, standing waves, Ultrasonics, piezo, electric method, Acoustic grating, Electromagnetic waves: Maxwell equation, Production of EM waves by dipole antenna, Propagation of EM waves in free space, wave equation, Cell phone reception				
Module – IV	Quantum Mechanics	L	T	S
		9	0	0
Postulates of Quantum mechanics, Black body radiation, Photoelectric effect, de Broglie hypothesis, Schrodinger Wave equation, Particle in a box (infinite potential well - three-dimensional box), Barrier penetration and quantum tunnelling				

Module - V	Basics of Optics	L	T	S
		9	0	0
Interference: Air wedge, Michelson's Interferometer, Fiber optics: propagation of light in optical fiber - Numerical aperture and Acceptance angle, Fiber Optic Communication System, Fiber Sensors (Virtual demo), Displacement, pressure sensor and Temperature sensor, Einstein Co-efficient and their relations, Nd:YAG laser, CO2 laser (construction, functioning and applications), dye laser				
Text Books: 1. Gaur, R. K., & Gupta, S. L. (2022). Engineering physics. Dhanpat Rai Publications. 2. Young, H. D., & Freedman, R. A. (2020). University physics with modern physics. Pearson.				
Reference Books: 1. Griffiths, D. J. (2018). Introduction to quantum mechanics. Cambridge University Press. 2. Mathur, D. S. (2010). Elements of properties of matter. S. Chand Publishing. 3. Silfvast, W. T. (2008). Laser fundamentals (2nd ed.). Cambridge University Press				
E- Resources: 1. Bimetallic Strips _ https://www.youtube.com/watch?v=WZQ8lvxdzDk 2. Optical Sensors_ https://auece.digimat.in/nptel/courses/video/108106173/L02.html 3. Scanning Tunnelling Electron Microscope_ https://www.youtube.com/watch?v=XNYZYbXNWQA				

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Internal Assessment Examinations		End Semester Examination
	CIA – I	CIA - II	
Remember	30	30	60
Understand	20	20	40
Apply			
Analyze			
Evaluate			
Create			

U26SHCH11	Engineering Chemistry (Common to AI&DS, BME, CSE, IT, ECE, EEE, MECH)	L	T	P	S	C
Nature of the Course	Basic Sciences	3	0	0	-	3
Pre – Requisites	Basic Chemistry					

Course Objectives:

The course is intended to

1. Recall the fundamental principles of water chemistry and various methods used for industrial and municipal water treatment.
2. Outline the basic concepts of nano chemistry and engineering applications of nanomaterials.
3. Understand the electrochemical principles, batteries, and fuel cells, with emphasis on emerging energy-storage technologies.
4. Compare the fundamental mechanisms of corrosion and coating methods for corrosion prevention and control.
5. Extend the knowledge of polymer chemistry with its properties and applications of polymers.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Remember	Relate the treatment solutions for drinking water and wastewater reuse.	PO1(3)	
CO 2	Understand	Classify the nano materials and composites for engineering and technology	PO1(3)	
CO 3	Remember	List the different types of electrochemical cells and energy storage methods such as batteries and fuel cells.	PO2(2)	
CO 4	Remember	Identify the corrosion mechanisms and list suitable methods for corrosion prevention and control.	PO4(3), PO8(1)	
CO 5	Understand	Outline the basic concepts of polymer chemistry in designing the materials.	PO9(1)	

Modules

Module - I	WATER AND ITS TREATMENT	L 9	T 0	S -
Water and its types - disadvantages of using hard water. Water quality parameters and standards; Industrial feed water, internal water treatment – Calgon and phosphate conditioning. Municipal water treatment – zeolite process, ion exchange and reverse osmosis.				
Module – II	FUNDAMENTALS OF NANO CHEMISTRY	L 9	T 0	S -
Classification, Size, dependent properties. Preparation of nanomaterials, Top-down and Bottom-Up approaches. Synthesis of nanomaterials sol gel, Chemical vapour deposition (CVD), laser ablation techniques – Applications of nanomaterials in medical and healthcare, energy and environmental protection, aerospace and automobiles.				
Module – III	ELECTROCHEMISTRY & BATTERIES	L 9	T 0	S -
Basics of Electrochemical cell, Nernst equation, Electrode potential, Redox reaction. Conductivity of electrolytes. Emerging battery storage technologies, Primary & Secondary Batteries, Alkaline batteries lithium polymer batteries. Fundamentals of fuel cells – H ₂ - O ₂ fuel cells.				

Module – IV	CORROSION AND CONTROL	L	T	S
		9	0	-
Fundamentals of corrosion - Chemical and electrochemical corrosions, galvanic series, factors influencing corrosion, Electrochemical protection. Methods of corrosion control - Organic and Inorganic coating.				
Module - V	POLYMER COMPOSITES	L	T	S
		9	0	-
Polymer- definition- degree of polymerization- functionality. Polymerization – addition, condensation and co-polymerization – free radical mechanism of addition polymerization. Preparation properties & uses of PVC, Nylon – 6,6 & Teflon. Plastics- classification- thermosetting and thermoplastics. Introduction to conducting & bio degradable polymers.				
Text Books: 1. Jain, P. C., & Jain, M. (2015). Engineering Chemistry. Dhanpat Rai Publishing Company (P) Ltd. 2. Puri Sharma and Pathania, Principles of Physical Chemistry, Vishal Publishing Co, 48 th Edition, 2024. 3. Thomas Engel, Maheswaramma and Chugh, Engineering Chemistry, First edition, Pearson, 2026.				
Reference Books: 1. Dr. A. Ravikrishnan, “Engineering Chemistry”, Srikrishna Hi-Tech publishing Company Pvt. Ltd., 21st Edition, 2022. 2. Shasi Chala, “A Textbook of Engineering Chemistry”, Dhanapat Rai Pub. Co., 2024. 3. Lodge, T. P., & Hiemenz, P. C. (2020). Polymer chemistry. CRC press.				
E- Resources: 1. Chemistry LibreTexts – https://chem.libretexts.org/ 2. OpenStax – Chemistry 2e – https://openstax.org/details/books/chemistry-2e 3. MIT OpenCourseWare – Chemistry – https://ocw.mit.edu/search/?d=Chemistry				

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Internal Assessment Examinations		End Semester Examination
	CIA - I	CIA - II	
Remember	30	30	60
Understand	20	20	40
Apply			
Analyze			
Evaluate			
Create			

U26SHTA11	தமிழர் மரபு / Heritage of Tamils (Common to AI&DS, BME, CSE, IT, ECE, EEE, MECH)	L	T	P	S	C
Nature of the Course	Humanities & Social Science	1	0	0	0	1
Pre – Requisites	-					

Course Objectives:

The course is intended to

1. இந்திய மொழிக் குடும்பம் மற்றும் தமிழ் இலக்கியங்களைப் பற்றி அறிந்து கொள்வர்.
2. பாறை ஓவியங்கள் மற்றும் நவீன ஓவியங்களின் வரலாற்றைப் பற்றி அறிவைப் பெறுவர்.
3. தமிழர்களின் கலைகள் மற்றும் விளையாட்டுகளைப் பற்றி அறிந்து கொள்வர்.
4. தொல்காப்பியம் மற்றும் சங்க இலக்கியங்களில் இடம்பெறும் திணைக் கோட்பாட்டைப் பற்றி அறிந்து கொள்வர்.
5. தமிழர்களின் தேசிய உணர்வு மற்றும் தமிழர் பண்பாட்டைப் பற்றி அறிந்து கொள்வர்.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	நினைவில் கொள்ளுதல்	தமிழ் மொழிக்குடும்பம் மற்றும் இலக்கியங்களை முழுமையாக அறிதல்.	PO10(2) PO12(3)	
CO 2	புரிந்து கொள்ளுதல்	பாறை ஓவியங்கள் மற்றும் நவீன ஓவியங்கள் குறித்த வரலாற்றை அறிந்துகொள்ளுதல்.	PO12(2)	
CO 3	நினைவில் கொள்ளுதல்	தமிழர்களின் கலைகள், விளையாட்டுகள் ஆகியவற்றைத் தெரிந்துகொள்ளுதல்.	PO8(1) PO10(2) PO12(3)	
CO 4	நினைவில் கொள்ளுதல்	தொல்காப்பியம் மற்றும் சங்க இலக்கியத் திணைக் கோட்பாடுகளைப் பற்றி அறிந்துகொள்ளுதல்.	PO8(1) PO10(1) PO12(1)	
CO 5	புரிந்து கொள்ளுதல்	தமிழர்களின் தேசிய உணர்வு, தமிழ்ப்பண்பாடு ஆகியவற்றை முழுமையாக அறிதல்.	PO8(1) PO10(1) PO12(3)	

Modules

அலகு-1	மொழி மற்றும் இலக்கியம்	L	T	S
		3	0	0
இந்திய மொழிக்குடும்பங்கள் – திராவிட மொழிகள் – தமிழ் ஒரு செம்மொழி – தமிழ்ச் செவ்விலக்கியங்கள் – திருக்குறளில் மேலாண்மைக் கருத்துகள் – தமிழ்க் காப்பியங்கள் – பக்தி இலக்கியம் – ஆழ்வார்கள் மற்றும் நாயன்மார்கள் – சிற்றிலக்கியங்கள் – தமிழிலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.				

அலகு-2	பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை / சிற்பக்கலை	L	T	S
		3	0	0
நடுகல் முதல் நவீன சிற்பங்கள் வரை – ஐம்பொன் சிலைகள் – பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள் – சுடுமண் சிற்பங்கள் – நாட்டுப்புறத் தெய்வங்கள் – குமரிமுனையில் திருவள்ளூர் சிலை – இசைக்கருவிகள் – மிருதங்கம், பறை, வீணை, யாழ், நாதஸ்வரம்.				
அலகு-3	நாட்டுப்புறக் கலைகள் / வீரவிளையாட்டுகள்	L	T	S
		3	0	0
தெருக்கூத்து – கரகாட்டம் – வில்லுப்பாட்டு – கணியான் கூத்து – ஓயிலாட்டம் – தோல்பாவைக் கூத்து – சிலம்பாட்டம் – வளரி – புலியாட்டம் – தமிழர்களின் விளையாட்டுகள்.				
அலகு-4	தமிழர்களின் திணைக் கோட்பாடுகள்	L	T	S
		3	0	0
தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக்கோட்பாடுகள் – தமிழர்கள் போற்றிய அறக்கோட்பாடுகள் – சங்க காலத்தில் தமிழகத்தில் எழுத்தறிவும் கல்வியும் – சங்ககால நகரங்களும் துறைமுகங்களும் – சங்க காலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி.				
அலகு-5	இந்திய தேசிய இயக்கம் மற்றும் இந்தியப் பண்பாட்டிற்கு தமிழர்களின் பங்களிப்பு	L	T	S
		3	0	0
இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிற பகுதிகளில் தமிழ்ப்பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம்.				
Text Books: 1. டாக்டர் க.க. பிள்ளை, “தமிழக வரலாறு மக்களும் பண்பாடும்”, தமிழ்நாடு பாடநூல் கல்வியியல் பணிகள் கழகம், 2021. 2. முனைவர் இல. சுந்தரம், “கணினித்தமிழ்”, விகடன் பிரசுரம், 2015.				
Reference Books: 1. “கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்”, தொல்லியல் துறை வெளியீடு. 2. “பொருளை – ஆற்றங்கரை நாகரிகம்”, தொல்லியல் துறை வெளியீடு, 2021.				
E- Resources: 1. http://www.news.mowval.in/News/tamilnadu/Nano-9202.html 2. https://ta.wikipedia.org/wiki				

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Continuous Internal Assessment		End Semester Examination
	CIA - I	CIA - II	
Remember	30	30	60
Understand	20	20	40
Apply			
Analyze			
Evaluate			
Create			

U26SHTA11	Heritage of Tamils (Common to AI&DS, BME, CSE, IT, ECE, EEE, MECH)	L	T	P	S	C
Nature of the Course	Humanities & Social Science	1	0	0	0	1
Pre – Requisites	-					

Course Objectives:

The course is intended to

1. To learn the Indian language family and Tamil literature.
2. To acquire knowledge on the history of rock paintings and modern paintings.
3. To learn the arts and games of Tamils.
4. To know Thinai Theory in Tolkappiyam and Sanga Literature.
5. To learn the national consciousness of Tamils and Tamil culture..

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Remember	To gain a comprehensive understanding of the Tamil language family and Tamil literature.	PO10(2) PO12(3)	
CO 2	Understand	To learn about the history of rock paintings and modern paintings.	PO12(2)	
CO 3	Remember	To learn about the history of rock paintings and modern paintings.	PO8(1) PO10(2) PO12(3)	
CO 4	Understand	To understand the Thinai theories in Tolkappiyam and Sangam literature.	PO8(1) PO10(1) PO12(1)	
CO 5	Remember	To gain a comprehensive understanding of the national consciousness of the Tamils and Tamil culture.	PO8(1) PO10(1) PO12(3)	

Modules

Module – I	LANGUAGE AND LITERATURE	L	T	S
		3	0	0
Language Families in India (L1) - Dravidian Languages (L1) – Tamil as a Classical Language (L1) - Classical Literature in Tamil (L1) – Secular Nature of Sangam Literature (L1) – Distributive Justice in Sangam Literature (L1) - Management Principles in Thirukural (L2) - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land (L1) - Bakthi Literature Azhwars and Nayanmars (L1) - Forms of minor Poetry (L1) - Development of Modern literature in Tamil (L1) - Contribution of Bharathiyar and Bharathidhasan. (L1)				
Module – II	HERITAGE - ROCK ART PAINTINGS TO MODERN ART - SCULPTURE	L	T	S
		3	0	0
Hero stone to modern sculpture (L1) - Bronze icons - Tribes and their handicrafts (L2) - Art of temple car making (L1) - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments (L1) - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram (L1) - Role of Temples in Social and Economic Life of Tamils. (L1)				

Module – III	FOLK AND MARTIAL ARTS	L	T	S
		3	0	0
Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, Silambattam, Valari, Tiger dance (L1) - Sports and Games of Tamils. (L1)				

Module – IV	THINAI CONCEPT OF TAMILS	L	T	S
		3	0	0
Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature (L2) - Aram Concept of Tamils (L1) - Education and Literacy during Sangam Age (L1) - Ancient Cities and Ports of Sangam Age (L1) - Export and Import during Sangam Age (L1) - Overseas Conquest of Cholas.				
Module – V	CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEME	L	T	S
		3	0	0
Contribution of Tamils to Indian Freedom Struggle (L1) - The Cultural Influence of Tamils over the other parts of India (L1) - Self-Respect Movement (L1) - Role of Siddha Medicine in Indigenous Systems of Medicine (L1) – Inscriptions & Manuscripts (L1) – Print History of Tamil Books. (L1)				
Text Books: 1. டாக்டர் க.க. பிள்ளை, “தமிழக வரலாறு மக்களும் பண்பாடும்”, தமிழ்நாடு பாடநூல் கல்வியியல் பணிகள் கழகம், 2021. 2. முனைவர் இல. சுந்தரம், “கணிதித்தமிழ்”, விகடன் பிரசுரம், 2015.				
Reference Books: 1. “கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்”, தொல்லியல் துறை வெளியீடு. 2. “பொருதை – ஆற்றங்கரை நாகரிகம்”, தொல்லியல் துறை வெளியீடு, 2021.				
E- Resources: 1. http://www.news.mowval.in/News/tamilnadu/Nano-9202.html 2. https://ta.wikipedia.org/wiki				

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Continuous Internal Assessment		End Semester Examination
	CIA - I	CIA - II	
Remember	30	30	60
Understand	20	20	40
Apply			
Analyze			
Evaluate			
Create			

U26CSES11	Problem Solving using C Programming (Common to AI & DS, BME ,CSE, IT , ECE, EEE, MECH)	L	T	P	S	C
Nature of the Course	Engineering Science	3	0	2	0	4
Pre – Requisites						

Course Objectives:

The course is intended to

1. Introduce the fundamentals of problem solving using algorithms, flowcharts and pseudocode.
2. Develop programming skills using the C programming language and its control structures.
3. Apply arrays, strings, pointers, structures and dynamic memory allocation to solve computational problems.
4. Develop programs for real-world data processing using functions, files and modular programming.
5. Strengthen logical thinking and practical programming skills through laboratory exercises.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Understand	Explain basic problem-solving techniques, algorithms, flowcharts and fundamental C programming concepts.	PO1	PSO1
CO 2	Apply	Develop C programs using decision-making, looping, functions and recursion.	PO1, PO2	PSO1
CO 3	Apply	Implement arrays, strings, searching, sorting and pointers to solve computational problems.	PO1, PO2, PO3	PSO1, PSO2
CO 4	Apply	Develop programs using structures, unions and dynamic memory allocation for record-oriented applications.	PO1, PO2, PO3	PSO1, PSO2
CO 5	Apply	Apply file handling and modular programming techniques to develop practical C applications.	PO1, PO2, PO3, PO5	PSO1, PSO3

Modules

Module - I	Introduction to Problem Solving and C Programming	L	T	S
		9	0	0
Topics: Problem-solving techniques – problem definition – algorithm – flowchart – pseudocode – program design and testing. Structure of a C program – compilation and execution – tokens – keywords – identifiers – constants – variables – data types. Input/output statements – formatted I/O – operators and expressions – arithmetic, relational, logical, assignment and conditional operators – type conversion. Application: Problem-solving and C programming concepts are applied to computational tasks such as unit conversion, electricity bill calculation, salary calculation, student mark analysis and basic mathematical computations.				
Module – II	Control Structures and Functions	L	T	S
		9	0	0
Topics: Decision-making statements – if – if-else – nested if – switch. Looping statements – for – while – do-while – break – continue. Functions – declaration and definition – parameters – return values – call by value – recursion – storage classes. Application: Control structures and functions are used in applications such as grade calculation, menu-driven programs, number analysis, mathematical computations and reusable program modules.				
Module – III	Arrays, Strings and Pointers	L	T	S
		9	0	0

Topics: One-dimensional and multidimensional arrays – array traversal and operations – searching and sorting. Character arrays and strings – string input/output – string handling functions. Pointers – pointer operators – pointer arithmetic – pointers and arrays – pointers and functions.

Application: Arrays, strings and pointers are applied in data processing, searching, sorting, text manipulation and efficient memory access.

Module – IV	Structures, Unions and Dynamic Memory Allocation	L	T	S
		9	0	0

Topics: Structures – declaration and initialization – nested structures – arrays of structures – structures and functions. Unions – typedef – enumerations. Dynamic memory allocation – malloc() – calloc() – realloc() – free().

Application: Structures and dynamic memory allocation are used for managing real-world records such as student information, employee details, product records and customer databases.

Module - V	Files and Advanced Problem Solving	L	T	S
		9	0	0

Topics: File concepts – file opening and closing – reading and writing files – text and binary files. Sequential and random access file operations – file pointers. Command-line arguments – preprocessor directives – modular programming – error handling – applications of C programming.

Application: File handling and advanced C programming techniques are applied in record management, data storage, report generation and simple database-oriented applications.

Laboratory Components

S.No	List of Exercises	CO Mapping	RBT
1	Develop a C program to calculate simple and compound interest.	CO2	Apply
2	Write a C program to calculate student total, average and percentage.	CO2	Apply
3	Write C programs using if, if-else and nested if statements.	CO2	Apply
4	Write programs using for, while and do-while loops.	CO2	Apply
5	Implement factorial and Fibonacci series using recursion.	CO2	Apply
6	Perform matrix addition and multiplication.	CO3	Apply
7	Write C programs for string operations without using library functions.	CO3	Apply
8	Implement dynamic memory allocation using malloc() and calloc().	CO4	Apply
9	Implement employee record storage using file handling.	CO5	Analyze
10	Develop a menu-driven mini project using structures and files.	CO4, CO5	Create

Total: 30 Periods

Text Books:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition, Prentice Hall - 1988.
2. E. Balagurusamy, Programming in ANSI C, McGraw-Hill Education -2024.

Reference Books:

1. Yashavant Kanetkar, Let Us C, BPB Publications - 2025.
2. Herbert Schildt, C: The Complete Reference, McGraw-Hill Education - 2000.
3. Reema Thareja, Programming in C, Oxford University Press - 2022.

E- Resources:

1. <https://www.geeksforgeeks.org/c-programming-language/>

2. <https://www.tutorialspoint.com/cprogramming/index.htm>
3. <https://scratch.mit.edu>

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Continuous Internal Assessment		End Semester Examination
	CIA - I	CIA - II	
Remember			
Understand	30	30	60
Apply	20	20	40
Analyze			
Evaluate			
Create			

U26SHPC11	Physics and Chemistry Laboratory	L	T	P	S	C
Nature of the Course	Basic science	0	0	2	0	1
Pre – Requisites	Basic Physics Laboratory					

Course Objectives:

The course is intended to

1. To become proficient in using different types of physics lab equipment.
2. To become knowledgeable about how to gather, present, and interpret data in a clear and succinct way.
3. To develop problem-solving abilities pertaining to the interpretation of experimental data and physics principles.
4. To identify methods for minimizing experimental measurement error.
5. To get the learner involved in every aspect of the lab tasks.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Apply	Apply the principles of elasticity to determine the Young's modulus of a material using non-uniform and uniform bending methods.	PO1, PO4	
CO 2	Apply	Apply the concepts of oscillatory motion to determine the rigidity modulus of a wire and the moment of inertia of a disc using a torsional pendulum	PO1, PO4	
CO 3	Apply	Apply the principles of wave mechanics to determine the velocity of ultrasonic waves in a liquid using an ultrasonic interferometer.	PO1, PO4	
CO 4	Apply	Apply the principles of quantum mechanics to determine Planck's constant by analyzing the photoelectric effect.	PO1, PO4	
CO 5	Apply	Apply the principles of optics and laser physics to determine physical quantities such as thickness of a wire, numerical aperture of an optical fiber, particle size of a powder, and wavelength of a laser source.	PO1, PO4, PO5	

List of Experiments

S.No	Exercises	CO Mapping	Bloom's Level
Properties of Matter			
1	Determination of Young's modulus of a given material- Non uniform bending method.	CO 1	Apply
2	Uniform bending – Young's modulus determination.	CO 1	Apply
Oscillations			
3	Torsional pendulum – Determination of rigidity modulus of wire and moment of inertia of disc	CO 2	Apply
Waves			
4	Determination of the velocity of ultrasonic waves of a liquid using an Ultrasonic Interferometer	CO 3	Apply
Quantum Mechanics			
5	Determination of Planck's constant by Photo-electric effect	CO 4	Apply
Applied Optics			
6	Determination of thickness of a thin wire – Air wedge method	CO 5	Apply
7	Determination the acceptance angle and	CO 5	Apply

	numerical aperture of the given optical Fiber.		
8	Determination of the particle size of the given powder using laser	CO 5	Apply
9	Determination of wavelength of a given laser source - Grating method	CO 5	Apply

List of Equipment for a Batch of 30 Students

S.No	Description	Particulars
1.	Vernier Calipers	For measuring dimensions in Young's modulus and wire thickness experiments. (15 Nos.)
2.	Screw Gauge	For precise measurement of wire diameter and thickness. (15 Nos.)
3.	Traveling Microscope	For measuring small displacements in bending experiments and the air wedge experiment. (10-15 Nos.)
4.	Weight Box (with slotted weights)	For applying force in Young's modulus and torsional pendulum experiments. (15 Sets)
5.	Ultrasonic Interferometer	For determining the velocity of ultrasonic waves in a liquid. (3-5 Nos.)
6	Photo-electric Effect Apparatus	For determining Planck's constant. (3-5 Nos.)
7	He-Ne Laser Source	For laser optics experiments (particle size, wavelength). (3-5 Nos.)
8	Optical Fiber Experiment Kit	For measuring acceptance angle and numerical aperture. (5-7 Nos.)
9	Spectrometer / Grating	For determining the wavelength of a laser source. (3-5 Nos.)
10	Digital Stopwatch	For timing oscillations in the torsional pendulum experiment. (10-15 Nos.)
11	Common Accessories	Includes: meter scales, stands, clamps, wooden beams, thin wires, glass plates, connecting wires, and powder samples for the laser experiment. (As required for each setup)

E- Resources:

1. <https://lo-amrt.vlabs.ac.in/exp/numerical-aperture-optical-fiber/>
2. <https://perimeterinstitute.ca/outreach/teachers/classroom-simulations-teachers>
3. <https://vlab.amrita.edu/index.php/images/theme/theme/amrita/MEC/index.php?sub=1&brc h=201&sim=803&cnt=5>

Assessment

Summative Assessment based on Continuous and End Semester Examination		
Bloom's Level	Rubric based Continuous Assessment [50 marks]	End Semester Examination [50 marks]
Remember		
Understand		
Apply	50	50
Analyze		
Evaluate		
Create		

CHEMISTRY LABORATORY

U26SHPC11	Physics and Chemistry laboratory	L	T	P	S	C
Nature of the Course	Basic science	0	0	30	-	1
Pre – Requisites	Basic chemistry laboratory					

Course Objectives:

The course is intended to

1. Students will understand and perform experiments based on core chemical principles relevant to engineering applications.
2. Students will learn to estimate the hardness of water to assess its suitability for drinking purposes.
3. Students will acquire the ability to perform acid-base titrations using instrumental methods such as conductometry, potentiometry, and pH metry.
4. Students will gain hands-on experience in synthesizing nanomaterials by sol-gel methods, like ZnO or AgO in the laboratory.
5. Students will learn to determine the rate of corrosion in mild steel in presence of inhibitors.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcomes	PO	PSO
CO 1	Understand	Students will develop practical skills through hands-on chemistry experiments relevant to engineering.	PO1	-
CO 2	Understand	Students will learn to determine important parameters such as water hardness and the corrosion rate of mild steel under various conditions	PO1	-
CO 3	Understand	Students will be able to apply techniques like conductometry, potentiometry, and pH metry to determine concentrations or equivalence points in acid-base reactions.	PO1	-
CO 4	Understand	Students will gain experience in synthesizing nanomaterials by sol-gel methods, like ZnO or AgO in the laboratory.	PO1	-
CO 5	Understand	Students will understand the rate of corrosion in mild steel in presence of inhibitors.	PO1	-

List of Experiments

S.No	Exercises	CO Mapping	Bloom's Level
Volumetric Analysis			
1	Estimation of Hardness of water by EDTA Complexometry method.	CO 1	Understand
2	Estimation of chlorine content in water by argerntometric method (mohrs method)	CO 1	Understand
3	Estimation of Alkalinity (OH^- , CO_3^{2-} & HCO_3^-) of water using standard HCl solution.	CO 1	Understand
Preparation			
4	Preparation of nanoparticles by sol-gel method	CO 2	Understand
Conductometry:			
5	Estimation of the concentration of strong acid by Conductometry.	CO 4	Understand
6	Estimation of the concentration of strong and weak acid in an acid mixture by Conductometry.	CO 4	Understand
Potentiometry:			

7	Estimation of concentration of Fe^{+2} ion by Potentiometry using KMnO_4 .	CO 3	Understand
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pH Metry:

8	Determination of an acid concentration using pH meter	CO 3	Understand
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Corrosion:

9	Determination of rate of corrosion of mild steel in the presence and absence of inhibitor.	CO 4	Understand
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Virtual lab experiments:

10	Construction of Fuel cell and it's working.	CO 3	Understand
11	Smart materials for Biomedical applications	CO 2	Understand
12	Batteries for electrical vehicles.	CO3	Understand

List of Equipment for a Batch of 30 Students

S.No	Description	Particulars
1.	Conductometry	Determination of conductivity (5 students per instrument)
2.	potentiometry	Determination of conductivity (5 students per instrument)
3.	P^{H} metry	Determination of P^{H} in given solution (5 students per instrument)

REFERENCE BOOKS:

- Lab manual for Engineering chemistry by B. Ramadevi and P. Aparna, S Chand Publications, New Delhi (2022)
- College Practical Chemistry by V.K. Ahluwalia, Narosa Publications Ltd. New Delhi (2007).
- Vogel's text book of practical organic chemistry 5th edition

E- Resources:

- Diwakar, Anita, Sushanth Poojary, and S. B. Noronha. "Virtual labs in engineering education: Implementation using free and open source resources." In *2012 IEEE International Conference on Technology Enhanced Education (ICTEE)*, pp. 1-4. IEEE, 2012.
- Selmer, Anders, Markus Kraft, Ralf Moros, and C. K. Colton. "Weblabs in chemical engineering education." *Education for Chemical Engineers* 2, no. 1 (2007): 38-45.
- Coble, Aaron, Andrew Smallbone, Amit Bhawe, Roger Watson, Andreas Braumann, and Markus Kraft. "Delivering authentic experiences for engineering students and professionals through e-labs." In *IEEE Educon 2010 Conference*, pp. 1085-1090. IEEE, 2010.

Assessment

Summative Assessment based on Continuous and End Semester Examination		
Bloom's Level	Rubric based Continuous Assessment [50 marks]	End Semester Examination [50 marks]
Remember		
Understand	50	50
Apply		
Analyze		
Evaluate		
Create		

U26MEES11	ENGINEERING PRACTICES LABORATORY	L	T	P	S	C
	(COMMON TO ALL BRANCHES)					
Nature of the Course	Professional Core	0	0	4	0	2
Pre – Requisites	-					

Course Objectives:

The course is intended to

1. To practice welding, sheet metal and machine assembly.
2. To practice basic building plan, pipelining and wood work.
3. To practice electric wiring and precautions for household applications and Power generation.
4. To practice soldering and develop the electronic device for household applications.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Course Outcome
CO 1	Perform basic welding and sheet metal.
CO 2	Perform basic building plan, pipelining and wood work.
CO 3	Perform electric wiring and precautions for household applications.
CO 4	Perform soldering to develop an electronic device for household applications.

LIST OF EXPERIMENTS/EXERCISES:

S.No	LIST OF EXPERIMENTS/EXERCISES:	
GROUP – A (MECHANICAL& CIVIL)		
	MECHANICAL ENGINEERING PRACTICES	15
MODULE 1	HANDS-ON EXPERIMENT	
1	Make a Steel Chair using Welding Technique.	
2	Make a Plain turning and Facing using Lathe.	
3	Make a given component using sheet metal.	
MODULE 2	Study Experiments (Identification of Parts, Functions of Each component, Integration and Overall working)	
1	Study of Thermal Power Plant (Steam Boiler) or Air-conditioning systems.	
2	Study of Various Machines & Machining Processes.	
3	Study of an Automobile –Two Wheeler/Car.	
	CIVIL ENGINEERING PRACTICES	15
MODULE 1	HANDS-ON EXPERIMENT	
1	Construct a water flow pipelining network for a residential building.	
2	Fabricate a given truss using wooden planks.	
3	Construct a residential building as per given building drawing using mount board/Thermocol sheet.	
MODULE 2	STUDY EXPERIMENTS	
1	Study of an Approved building plan and various details.	
2	Study of a Highway network and various elements.	
3	Study of construction materials and its usage in building construction.	
GROUP – B (ELECTRICAL& ELECTRONICS)		
	ELECTRICAL ENGINEERING PRACTICES	15
MODULE 1	HANDS-ON EXPERIMENT	
1	House Wiring (3-pin socket, staircase wiring, Lamp load,MCB, Energy meter, fuse)	
2	Series and Parallel Connection of UPS Batteries and Solar Panel.	
3	Assembly of water level indicator using Arduino.	
MODULE 2	STUDY EXPERIMENTS	
1	Study of Solar Power Generation.	

2	Study of 22kV/440V Step-down Transformer at Power House.	
3	Study of Electrical Household Appliances (Washing Machine, Electric Kettle, Induction Stove(anyone))	
	ELECTRONICS ENGINEERING PRACTICES	15
MODULE 1	HANDS-ON EXPERIMENT	
1	LED brightness changing systems based on ambient light.	
2	Digital thermometer with LCD Display.	
3	Voltage regulator for domestic applications.	
MODULE 2	STUDY EXPERIMENTS	
1	Study of Audio system.	
2	Study of AM and FM Transceiver.	
3	Study of LED TV.	
4	Study of overall Information and Communication Technology (ICT) functional structure of KIOT (Internet Infrastructure).	
Total: 60 Periods		
REFERENCE/LAB MANUAL/SOFTWARE:		
1	Dr.V.Ramesh babu “Engineering Practices Laboratory Manual””, VRB Publisher Pvt. Ltd., Chennai, 11 th edition, 2020.	
2	Ramesh Singh “Applied Welding: Process, Codes and Standards”, Elsevier material, First edition 2012.	
VIDEO REFERENCES:		
1	https://www.youtube.com/watch?v=nGfVTNfNwnk	
2	https://www.youtube.com/watch?v=aJp2g1BKXVc&list=PLX2gX-ftPVXU59ggWS3t0sThVF18h5ME2	
WEB REFERENCES:		
1	https://nptel.ac.in/courses/112106286	
2	https://www.brainkart.com/article/Dynamics-of-Particles_6788/	
ONLINE COURSES:		
1	https://nptel.ac.in/courses/112106286	
2	https://in.coursera.org/learn/engineering-mechanics-statics	

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Internal Assessment Examinations		End Semester Examination
	CIA – I [50 marks]	CIA- II [50 marks]	
Remember			
Understand	20	20	40
Apply	30	30	60
Analyze			
Evaluate			
Create			

U26SHMC11	HUMAN VALUES AND PROFESSIONAL EXCELLENCE - I	L	T	P	S	C
Nature of the Course	Humanities and Social Science	1	-	2	1	1
Pre – Requisites	None					

Course Objectives:

The course is intended to

1. Develop self-awareness, emotional intelligence and confidence for purposeful personal growth.
2. Apply goal-setting, decision-making and time-management techniques to academic and professional responsibilities.
3. Develop healthy strategies for stress management, resilience and personal well-being.
4. Cultivate human values, ethical reasoning, professional conduct and appropriate interpersonal etiquette.
5. Use social media, digital platforms and generative AI responsibly for professional development and career growth.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Understand	Explain the role of self-awareness, personal values and emotional intelligence in personal and interpersonal effectiveness.	PO6, PO8, PO10	
CO 2	Apply	Apply goal-setting, decision-making and time-management methods to plan and prioritize responsibilities.	PO6, PO8, PO10, PO12	
CO 3	Apply	Apply appropriate stress-management and resilience practices to support personal well-being.	PO6, PO8, PO12	
CO 4	Analyze	Analyze professional situations and choose value-based, ethical and culturally sensitive courses of action.	PO6, PO8, PO9, PO10	
CO 5	Evaluate	Evaluate digital professional practices and use social media and generative AI responsibly with due regard to privacy, attribution and integrity.	PO5, PO6, PO8, PO10, PO12	

Modules

Module - I	SELF-AWARENESS AND EMOTIONAL INTELLIGENCE	L	T	S
		3	0	3
Self-awareness and self-reflection; defining success and personal direction; needs and wants; Maslow's hierarchy of needs; personal values and belief systems; strengths and areas for improvement. Emotional intelligence: self-awareness, self-regulation, self-motivation, empathy and social skills. Personality assessment as a tool for self-reflection; growth mindset; self-confidence; responsible decision-making; personal development action plan. Activity: Psychometric/self-assessment exercise followed by preparation of a personal development action plan.				

Module – II	GOAL SETTING, DECISION MAKING AND TIME MANAGEMENT	L	T	S
		3	0	3
Concept of goals; possibility and feasibility; SMART goals; short-term, medium-term and long-term goals; goal prioritization; planning and execution. Decision-making process; time inventory; identifying time wasters; procrastination management; prioritization using the Urgent-Important (Eisenhower) Matrix; balancing academic, personal and professional responsibilities. Activity: Preparation of short-term and long-term goals with an actionable execution plan.				
Module – III	STRESS MANAGEMENT AND PERSONAL WELL-BEING	L	T	S
		3	0	3
Concept and types of stress; positive and negative stress; sources and effects of stress; stress appraisal and situation handling; anxiety and adversity management. Healthy coping mechanisms; relaxation and mindfulness techniques; sleep, physical well-being and healthy routines; managing academic and professional pressure; work-life balance; personal resilience; stress-management practices. Activity: Stress-awareness exercise and preparation of an individual stress-management plan.				
Module – IV	HUMAN VALUES, PROFESSIONAL ETHICS AND ETIQUETTE	L	T	S
		3	0	3
Meaning and importance of human values; integrity and honesty; respect; empathy and compassion; responsibility and accountability; tolerance and cultural sensitivity. Professional ethics; ethical decision-making; professional conduct and workplace behaviour; communication manners; social, business, dining, telephone and digital etiquette; grooming and personal hygiene; cultural adaptability. Activity: Role-play and demonstration of professional, social and workplace etiquette through real-life situations.				
Module V	DIGITAL PROFESSIONALISM AND CAREER DEVELOPMENT	L	T	S
		3	0	3
Role and utility of social media; digital footprint; online reputation; privacy and security awareness; professional communication online; professional use of social media; LinkedIn and professional networking; personal branding; blogs, websites and professional digital content; building a digital portfolio. Generative AI tools for professional development; responsible and ethical use of AI; AI-generated content, attribution and plagiarism; misinformation and professional credibility; do's and don'ts of professional social media usage. Activity: Create or update a LinkedIn profile and professional digital portfolio; develop a professional webpage or blog using appropriate digital and AI tools.				
Text Books:				
1. Trainer and Faculty Lecture Notes and PPT				
Reference Books:				
1. E. Suresh Kumar, P. Sreehari, J. Savithri, Communication Skills and Soft Skills: An Integrated Approach, Pearson Education India, 2011				
2. Alex K., Soft Skills: Know Yourself and Know the World, S. Chand & Company Pvt. Ltd., 2014.				
3. Shiv Khera, You Can Win: A Step-by-Step Tool for Top Achievers, Bloomsbury Publishing, 2013.				
4. Brian Tracy, Goals! Third Edition: How to Get Everything You Want—Faster Than You Ever Thought Possible, Penguin Random House India.				
5. Kathryn Critchley, Margaret Greenhall, Stress Management Skills Training Course: Exercises and Techniques to Manage Stress and Anxiety, Universe of Learning Ltd., 2010.				
6. Brian Tracy, Time Management, AMACOM, 2014.				
E- Resources:				
1. https://www.youtube.com/watch?v=L4N1q4RNI9I				
2. https://www.youtube.com/watch?v=TQMbvJNRpLE				
3. https://www.youtube.com/watch?v=wsNzAuYDgy0				
4. https://www.youtube.com/watch?v=RWZluriQUzE				

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	15
Understand	Tutorial Class / Assignment	5	
	Attendance	5	

Summative Assessment			
Bloom's Category	Internal Assessment Examinations		End Semester Examination
	CIA – I	CIA - II	
Remember	10	10	20
Understand	30	25	50
Apply	5	10	20
Analyze	5	5	10
Evaluate			
Create			

U26SHPY11	Physical Education and Yoga- I	L	T	P	S	C
Nature of the Course	Basic Physical Education	3	0	0	0	1
Pre – Requisites	-					

Course Objectives:

The course is intended to

1. To impart the fundamentals of physical education for development of students' physical, mental, and social well-being
2. To instil a lifelong appreciation for physical activity towards the development of positive attitude and fostering values of team work and sportsmanship.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Understand	Understand and explain the importance of physical activity for mental and physical health.	-----	
CO 2	Understand	Apply basic principles of exercise science in the routine life.	PO1(3)	
CO 3	Understand	Develop teamwork, discipline, and leadership through sports and group activities and collaborate effectively.	PO8(3)	
CO 4	Understand	Demonstrate independent learning in health, nutrition, and fitness-related topics.	PO11(2)	
CO 5	Understand	Basic Anatomy and Physiology of the Human Body. Physiology Asanas – Pranayama – Bandhas – Mudras – Kriyas – Nadis – Chakras – Kundalini shakti.	PO11(2)	

Modules

Module - I	Introduction to physical education:	L	T	S
		3	0	0
Exercise for Good Posture – Conditioning and Calisthenics for Before start, Jogging, Bending, Twisting, Standing, Sitting and Relaxation, Training on First Aid Practices.				
Module – II	Participation of athletic events:	L	T	S
		3	0	0
Rules and regulations of important athletic events, Sprint, Jumps, Throws and Hurdles.				
Module – III	Skill development in any one of the following outdoor games:	L	T	S
		3	0	0
Basket Ball, Volley Ball, Ball Badminton, Football, Hockey, Kho-Kho, Kabaddi, Cricket, Hand ball and Tennis.				
Module – IV	Skill development in any one of the following indoor games:	L	T	S
		3	0	0
Shuttle Badminton, Chess and Table Tennis.				
Module - V	Basics anatomy and yoga asanas	L	T	S
		3	0	0
Basic Anatomy and Physiology of the Human Body. Physiology Asanas – Pranayama – Bandhas – Mudras – Kriyas – Nadis – Chakras – Kundalini shakti.				
Text Books:				
1. Singh, A. (2008). Essentials of physical education. Kalyani Publishers. 2. Kamlesh, M. L. (2006). Psychology in physical education and sport (3rd ed.). Metropolitan Book Co. 3. Mangal, S. K. (2009). <i>Psychology of sports performance</i>. Sports Publication.				
E- Resources:				
1. https://www.who.int/health-topics/physical-activity				

SEMESTER - II

U26SHMA21	Linear Algebra (Common to AI&DS, BME, CSE, ECE, EEE, IT, MECH)	L	T	P	S	C
Nature of the Course	Basic Sciences	3	1	0	-	4
Pre – Requisites	Matrices and Determinant & Applications					

Course Objectives:

The course is intended to

1. Recall the fundamental concepts and terminology of systems of linear equations, matrices, and vector spaces.
2. Explain the concepts of vector spaces, subspaces, linear transformations, eigenvalues, and eigenvectors.
3. Apply linear transformations, eigenvalues, eigenvectors, diagonalization, and matrix representations.
4. Apply the concepts of inner product concepts, orthogonality, and orthogonalization techniques to solve linear algebra problems.
5. Apply appropriate matrix decomposition techniques to solve and interpret systems of linear equations and related engineering problems.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Remember	Recall the fundamental concepts of systems of linear equations, matrices, and vector spaces.	PO1(3)	
CO 2	Understand	Explain the concepts of vector spaces, linear transformations, eigenvalues, eigenvectors, and diagonalization.	PO1(3)	
CO 3	Apply	Analyze linear transformations, diagonalization, and matrix representations using eigenvalues and eigenvectors.	PO1 (3)	
CO 4	Apply	Apply inner product concepts, orthogonality, and orthogonalization techniques to solve linear algebra problems.	PO1 (2)	
CO 5	Apply	Apply suitable matrix decomposition techniques to solve systems of linear equations and related engineering problems.	PO5(3)	

Modules

Module – I	System of linear equation	L	T	S
		9	3	0
Introduction to Linear Equation, Matrices and System, Gaussian Elimination and Gauss Jordan methods – Elementary matrices – permutation matrix – inverse matrices – system of linear equation – LU factorization Activities: Exercises to Based Implementation of Gaussian Elimination, Gauss–Jordan Method and LU Factorization Using Sagemath.				
Module – II	Vector Spaces	L	T	S
		9	3	0
Introduction to Vector Spaces, Examples, Subspaces, Linear Combinations, Span, Generating Sets, Linear Dependence and Independence, Basis and Dimension, Dimension of Subspaces. Activities: Exercises to test linear dependence and independence using rank using.				
Module – III	Linear Transformations and Diagonalization	L	T	S
		9	3	0
Null space, Range, Rank – Nullity theorem – statement interpretations and simple applications, Matrix representation of a linear transformation, Eigenvalues & Eigenvectors, Diagonalizability. Activities: exercises to compute the matrix representation of a linear transformation using Sagemath.				

Module – IV	Inner Product Spaces	L	T	S
		9	3	0
Inner product, Norms, Cauchy - Schwarz inequality, Orthogonal and orthogonal sets, Orthogonal complement, Gram - Schmidt orthogonalization, Simple problems (up to R^3). Activities: Exercises to compute inner products and vector norms using Sagemath.				
Module – V	Matrix Decomposition	L	T	S
		9	3	0
Orthogonal transformation of a symmetric matrix to diagonal form - Positive definite matrices, QR decomposition, Singular Value Decomposition (SVD), Least squares solutions- simple problems (up to 3×3 matrices). Activities: Exercises to check if a matrix is positive definite, perform QR decomposition and SVD using built-in functions using Sagemath.				
Text Books: 1. Linear algebra. Friedberg, S. H., Insel, A. J., & Spence, L. E. Pearson. (2022). 2. Introductory Linear Algebra – and Apply first course, Bernard Kolman and David. R. Hill. Pearson Education. 9th edition. (2011).				
Reference Books: 1. Schaum's outline of matrix operations. Bronson, R. McGraw-Hill Education. (2011). 2. Linear algebra and its applications. Strang, G., & Thomson, R. Brooks/Cole, (2005).				
E- Resources: 1. Linear Algebra Mathematics MIT OpenCourseWare 2. 3Blue1Brown 3. Use SageMath Online – CoCalc				

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Internal Assessment Examinations		End Semester Examination
	CIA - I	CIA - II	
Remember	15	10	20
Understand	15	10	20
Apply	20	30	60
Analyze			
Evaluate			
Create			

U26SHTA21	தமிழரும் தொழில்நுட்பமும் / TAMILS AND TECHNOLOGY (Common to AI&DS, BME, CSE, IT, ECE, EEE, MECH)	L	T	P	S	C
Nature of the Course	Humanities & Social Science	1	0	0	0	1
Pre – Requisites	-					

Course Objectives:

The course is intended to

1. தமிழர்களின் தொன்மையான தொழில்நுட்ப அறிவையும் அறிவியல் சிந்தனைகளையும் அறிந்து கொள்வர்.
2. தமிழர்களின் வேளாண்மை மற்றும் நீர்மேலாண்மைத் தொழில்நுட்பங்களை புரிந்து கொள்வர்.
3. கட்டிடக்கலை, சிற்பக்கலை, உலோகத் தொழில்நுட்பம் மற்றும் கைவினைத் தொழில்நுட்பத்தில் தமிழர்களின் பங்களிப்பை அறிந்து கொள்வர்.
4. கடல்சார் தொழில்நுட்பம், கப்பல் கட்டுமானம் மற்றும் வாணிப வளர்ச்சியில் தமிழர்களின் திறனைப் புரிந்து கொள்வர்.
5. சித்த மருத்துவம், மூலிகை அறிவு மற்றும் பாரம்பரிய அறிவியல் முறைகளை அறிந்து கொள்வர்.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	நினைவில் கொள்ளுதல்	சங்ககால தொழில்நுட்ப அறிவை மாணவர்கள் முழுமையாக அறிந்துணர்தல்.	PO1(1)	
CO 2	புரிந்து கொள்ளுதல்	வரலாறு மற்றும் தொல்லியல் சான்றுகளை ஆதாரமாகக் கொண்டு தெரிந்துகொள்ளுதல்	PO12(1)	
CO 3	நினைவில் கொள்ளுதல்	உலோகவியல் பயன்பாடு, உற்பத்தி குறித்த அறிவைப் பெறுதல்.	PO8(1)	
CO 4	நினைவில் கொள்ளுதல்	வேளாண்மை செயலாக்கத்தில் பயன்படுத்தப்படும் பழங்கால நுட்பங்களை அறிந்துகொள்ளுதல்.	PO12(2)	
CO 5	புரிந்து கொள்ளுதல்	தமிழ் மொழியில் புதிய மென்பொருள் உருவாக்கும் திறனை மேம்படுத்துதல்.	PO7(2)	

Modules

அலகு-1	நெசவு மற்றும் பானைத் தொழில்நுட்பம்	L	T	S
		3	0	0
சங்க காலத்தில் நெசவுத் தொழில் – பானைத் தொழில்நுட்பம் – கருப்பு சிவப்பு பாண்டங்கள் – பாண்டங்களில் கீறல் குறியீடுகள்.				
அலகு-2	வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்	L	T	S
		3	0	0
சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் – சங்க காலத்தில் வீட்டுப் பொருட்களின் வடிவமைப்பு – சங்க காலத்தில் கட்டுமானப் பொருட்களும் நடுகல்லும் – சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் – மாமல்லபுரச் சிற்பங்களும் கோவில்களும் – சோழர் காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் – நாயக்கர் காலக் கோயில்கள் – மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் – செட்டிநாட்டு வீடுகள் – பிரிட்டிஷ் காலத்து தென்னிந்திய இந்தோ-சாரசனிக் கட்டிடக்கலை.				

அலகு-3	உற்பத்தித் தொழில்நுட்பம்	L	T	S
		3	0	0
கப்பல் கட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருக்குதல், எஃகு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் அச்சடித்தல் - மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - எலும்புத்துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.				
அலகு-4	வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில்நுட்பம்	L	T	S
		3	0	0
அணை, ஏரி, குளங்கள், மதகு - சோழர் காலக் 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-5	அறிவியல் தமிழ் மற்றும் கணினித்தமிழ்	L	T	S
		3	0	0
அறிவியல் தமிழின் வளர்ச்சி - கணினித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின் பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக்கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத் திட்டம்.				
Text Books: 1. டாக்டர் க.க. பிள்ளை, "தமிழக வரலாறு மக்களும் பண்பாடும்", தமிழ்நாடு பாடநூல் கல்வியியல் பணிகள் கழகம், 2021. 2. முனைவர் இல. சுந்தரம், "கணினித்தமிழ்", விகடன் பிரசுரம், 2015.				
Reference Books: 1. "கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்", தொல்லியல் துறை வெளியீடு. 2. "பொருறை - ஆற்றங்கரை நாகரிகம்", தொல்லியல் துறை வெளியீடு, 2021.				
E- Resources: 1. http://www.news.mowval.in/News/tamilnadu/Nano-9202.html 2. https://ta.wikipedia.org/wiki				

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Continuous Internal Assessment		End Semester Examination
	CIA - I	CIA - II	
Remember	30	30	60
Understand	20	20	40
Apply			
Analyze			
Evaluate			
Create			

U26SHTA21	TAMILS AND TECHNOLOGY (Common to AI&DS, BME, CSE, IT, ECE, EEE, MECH)	L	T	P	S	C
Nature of the Course	Humanities & Social Science	1	0	0	0	1
Pre – Requisites	-					

Course Objectives:

The course is intended to

1. To learn about the ancient technological knowledge and scientific thinking of the Tamils.
2. To understand the agricultural and water management technologies of the Tamils.
3. To learn about the contributions of the Tamils to architecture, sculpture, metallurgy, and handicraft technologies.
4. To understand the expertise of the Tamils in maritime technology, shipbuilding, and the development of trade.
5. To learn about Siddha medicine, herbal knowledge, and traditional scientific methods.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Remember	To gain a comprehensive understanding of the technological knowledge of the Sangam period.	PO1(1)	
CO 2	Understand	To acquire knowledge based on historical and archaeological evidence.	PO12(1)	
CO 3	Remember	To gain knowledge about the applications and production processes of metallurgy.	PO8(1)	
CO 4	Understand	To learn about the ancient techniques used in agricultural processing	PO12(2)	
CO 5	Remember	To develop the skills required to create new software in the Tamil language.	PO7(2)	

Modules

Module-I	WEAVING AND CERAMIC TECHNOLOGY	L	T	S
		3	0	0
Weaving and Ceramic Technology Weaving Industry during Sangam Age (L1) - Ceramic technology (L1) - Black and Red Ware Potteries (BRW) – Graffiti on Potteries. (L2)				
Module –II	DESIGN AND CONSTRUCTION TECHNOLOGY	L	T	S
		3	0	0
Designing and Structural construction House & Designs in household materials during Sangam Age (L1) - Building materials and Hero stones of Sangam age (L1) – Details of Stage Constructions in Silappathikaram (L2) - Sculptures and Temples of Mamallapuram (L1) - Great Temples of Cholas and other worship places (L1) - Temples of Nayaka Period (L1) - Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal (L2) - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period. (L1)				
Module –III	MANUFACTURING TECHNOLOGY	L	T	S
		3	0	0
Art of Ship Building (L2) – Metallurgical studies (L1) - Iron industry (L1) - Iron smelting, steel -Copper and goldCoins as source of history (L2) - Minting of Coins (L1) - Beads making-industries Stone beads (L1) - Glass beads (L1) - Terracotta beads -Shell beads/ bone beats (L1) - Archeological evidences (L2) - Gem stone types described in Silappathikaram. (L1)				

Module –IV	AGRICULTURE AND IRRIGATION TECHNOLOGY	L	T	S
		3	0	0
Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry (L1) - Wells designed for cattle use (L1) - Agriculture and Agro Processing (L1) - Knowledge of Sea - Fisheries (L1) - Pearl (L1) - Conche diving (L1) - Ancient Knowledge of Ocean(L1) – Knowledge Specific Society.(L1)				
Module –V	SCIENTIFIC TAMIL & TAMIL COMPUTING	L	T	S
		3	0	0
Development of Scientific Tamil (L1) - Tamil computing (L1) – Digitalization of Tamil Books (L1) – Development of Tamil Software (L1) – Tamil Virtual Academy (L2) – Tamil Digital Library – Online Tamil Dictionaries (L2) – Sorkuvai Project. (L1)				
Text Books: 1. டாக்டர் க.க. பிள்ளை, "தமிழக வரலாறு மக்களும் பண்பாடும்", தமிழ்நாடு பாடநூல் கல்வியியல் பணிகள் கழகம், 2021. 2. முனைவர் இல. சுந்தரம், "கணினித்தமிழ்", விகடன் பிரசுரம், 2015.				
Reference Books: 1. "கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்", தொல்லியல் துறை வெளியீடு. 2. "பொருதை – ஆற்றங்கரை நாகரிகம்", தொல்லியல் துறை வெளியீடு, 2021.				
E- Resources: 1. http://www.news.mowval.in/News/tamilnadu/Nano-9202.html 2. https://ta.wikipedia.org/wiki				

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Continuous Internal Assessment		End Semester Examination
	CIA - I	CIA - II	
Remember	30	30	60
Understand	20	20	40
Apply			
Analyze			
Evaluate			
Create			

U26ECPC21	ELECTRON DEVICES	L	T	P	S	C
Nature of the Course	Professional Core	3	0	0	0	3
Pre – Requisites	Engineering Physics, Circuit Analysis					

Course Objectives:

The course is intended to

1. Understand the fundamental concepts and operation of intrinsic and extrinsic semiconductors, PN junction diodes, and their characteristics.
2. Analyze the operation, configurations, biasing techniques, and frequency response of transistor amplifiers.
3. Understand and analyze the operation and characteristics of JFETs, MOSFETs, CMOS circuits, and IGBTs.
4. Analyze rectifier circuits, filters, voltage regulators, and switched-mode power supplies.
5. Understand and analyze the characteristics, operation, and applications of special semiconductor and power electronic devices.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Understand	Explain the properties of semiconductors, carrier transport mechanisms, PN junction operation, diode characteristics, diode current equation, and junction capacitance.	PO1, PO2	PSO1
CO 2	Analyze	Analyze the operation, configurations, biasing techniques, equivalent models, and frequency response of BJT amplifiers	PO1, PO2	PSO1, PSO2
CO 3	Analyze	Analyze the characteristics and operation of JFETs, MOSFETs, CMOS circuits, inverter transfer characteristics, and IGBTs.	PO1, PO2	PSO1, PSO2
CO 4	Analyze	Analyze the performance of rectifiers, filters, voltage regulators, and switched-mode power supply circuits.	PO1, PO2, PO3	PSO1, PSO2
CO 5	Understand	Explain and analyze the characteristics, operation, and applications of special semiconductor and power devices including Zener diode, Tunnel diode, PIN diode, Varactor diode, LED, Photodiode, Phototransistor, SCR, DIAC, TRIAC, and UJT.	PO1, PO2	PSO1, PSO2

Modules

Module - I	SEMICONDUCTOR DIODES	L	T	S
		9	0	0
Types of semiconductor: Intrinsic, extrinsic semiconductor, P-type and N-type semiconductors, Fermi energy level, variation of Fermi level with temperature, electrical conductivity, Drift & diffusion current, PN Junction: forward bias, reverse bias – Diode current equation – Capacitance.				
Module – II	TRANSISTORS	L	T	S
		9	0	0
NPN Operations – Configurations – Biasing methods – Bias compensation techniques – Hybrid parameter for CE amplifier – Miller's theorem – Darlington amplifier and bootstrapping emitter follower – Hybrid π equivalent model – Low and high frequency response of CE amplifier.				
Module – III	FIELD EFFECT TRANSISTOR	L	T	S
		9	0	0
JFET types and operation of N-Channel and P-channel – MOSFET types and operation – CMOS operation, inverter voltage transfer curve and threshold voltage – Insulated Gate Bipolar Transistor.				

Module – IV	RECTIFIERS AND POWER SUPPLIES	L 9	T 0	S 0
Analysis of half wave, full wave and bridge rectifiers with resistive load – Analysis of ripple voltage with C and L filters – Voltage regulators: Zener diode regulator, transistor series and shunt regulator – SMPS.				
Module - V	SPECIAL SEMICONDUCTOR DEVICES	L 9	T 0	S 0
Zener diode, Tunnel diode, PIN diode, Varactor diode, LED, Photodiode, Phototransistor, Photoconductive and Photovoltaic cells, SCR, DIAC, TRIAC and UJT.				
Text Books: 1. S. Salivahanan and N. Suresh Kumar, Electronic Devices and Circuits, 5th Edition, McGraw Hill, 2022. 2. Robert L. Boylestad and Louis Nashelsky, Electronic Devices and Circuit Theory, 11th Edition, Pearson Education.				
Reference Books: 1. Adel S. Sedra, Kenneth C. Smith, Tony Chan Carusone and Vincent Gaudet, Microelectronic Circuits, 8th Edition, 2. Ramana Pilla and Chitambara Rao Karedla, Electronic Devices and Circuits, 2nd Edition, S. Chand Publishing, 2026 3. Thomas L. Floyd, Electronic Devices, Pearson Education. 4. David A. Bell, Electronic Devices and Circuits, Oxford University Press.				
E- Resources: NPTEL – Semiconductor Devices and Circuits - IISc Bangalore , Introduction to Semiconductor Devices - IIT Hyderabad , Semiconductor Devices- IIT Delhi.				

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Internal Assessment Examinations		End Semester Examination
	CIA - I	CIA - II	
Remember			
Understand	40	40	40
Apply			
Analyze	60	60	60
Evaluate			
Create			

U26EEES23	Electric Circuit Analysis	L	T	P	S	C
Nature of the Course	Engineering Science	3	0	0	0	3
Pre – Requisites	Basic Mathematics and Physics					

Course Objectives:

The course is intended to

1. To introduce electric circuits and its analysis
2. To impart knowledge on solving circuits using network theorems
3. To introduce the phenomenon of resonance in coupled circuits.
4. To educate on obtaining the transient response of circuits.
5. To Phasor diagrams and analysis of three phase circuits

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Understand	Explain the fundamental concepts of electric circuits and apply basic circuit laws for circuit analysis.	PO1	PSO1
CO 2	Apply	Apply network theorems such as Superposition, Thevenin's, Norton's and Maximum Power Transfer theorems to solve electrical circuits	PO1, PO2	PSO1
CO 3	Analyze	Analyze resonance and coupled circuits to determine circuit parameters and frequency response.	PO1, PO2	PSO1
CO 4	Analyze	Analyze the transient response of first-order and second-order electrical circuits using appropriate mathematical techniques.	PO1, PO2, PO4	PSO1
CO 5	Apply	Apply phasor concepts and analyze balanced and unbalanced three-phase circuits to determine voltage, current and power.	PO1, PO2, PO5	PSO1

Modules

Module - I	BASIC CIRCUITS ANALYSIS	L	T	S
		9	0	0
Ohm's Law – Kirchoffs laws – DC and AC Circuits – Resistors in series and parallel circuits – Mesh current and node voltage method of analysis for D.C and A.C. circuits – Phasor Diagram – Power, Power Factor and Energy.				
Module – II	NETWORK REDUCTION AND NETWORK THEOREMS FOR DC AND AC CIRCUITS	L	T	S
		9	0	0
Network reduction: voltage and current division, source transformation – star delta conversion. Thevenins and Norton & Theorem – Superposition Theorem – Maximum power transfer theorem – Reciprocity Theorem.				
Module – III	RESONANCE AND COUPLED CIRCUITS	L	T	S
		9	0	0
Series and parallel resonance – their frequency response – Quality factor and Bandwidth - Self and mutual inductance – Coefficient of coupling – Tuned circuits – Single tuned circuits.				
Module – IV	TRANSIENT RESPONSE FOR DC CIRCUITS	L	T	S
		9	0	0
Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C. with sinusoidal input – Characterization of two port networks in terms of Z,Y and h parameters				

Module - V	THREE PHASE CIRCUITS	L	T	S
		9	0	0
Three phase balanced / unbalanced voltage sources – analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced & unbalanced – phasor diagram of voltages and currents – power and power factor measurements in three phase circuits- logic gate simulators,				
Text Books: 1. William H. Hayt Jr, Jack E. Kemmerly and Steven M. Durbin, “Engineering Circuits Analysis”, Tata McGraw Hill publishers, 6 th edition, New Delhi, 2003. 2. Joseph A. Edminister, Mahmood Nahri, “Electric circuits”, Schaum’s series, Tata McGraw-Hill, New Delhi, 2001.				
Reference Books: 1. Paranjothi SR, “Electric Circuits Analysis,” New Age International Ltd., New Delhi, 1996. 2. Sudhakar A and Shyam Mohan SP, “Circuits and Network Analysis and Synthesis”, Tata McGraw Hill, 2007. 3. Chakrabati A, “Circuits Theory (Analysis and synthesis), Dhanpath Rai & Sons, New Delhi, 1999. 4. Charles K. Alexander, Mathew N.O. Sadiku, “Fundamentals of Electric Circuits”, Second Edition, McGraw Hill, 2003.				
E- Resources: 1. https://archive.nptel.ac.in/courses/108/106/108106172/ 2. https://www.falstad.com/circuit/				

Assessment

Formative assessment			
Bloom’s Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom’s Category	Internal Assessment Examinations		End Semester Examination
	CIA - I	CIA- II	
Remember	10	10	20
Understand	20	20	40
Apply	30	30	40
Analyze			
Evaluate			
Create			

U26MEES21	Engineering Drawing	L	T	P	S	C
Nature of the Course	Professional Core	3	0	0	0	3
Pre – Requisites	-					

Course Objectives:

The course is intended to

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

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Remembering	Explain basic mechanical engineering principles, units, dimensions, and professional ethics.	---	---
CO 2	Understand	Apply basic concepts of stress, strain, bending, torsion, and axial loading.	PO1(3)	PSO1(3) PSO2(2)
CO 1	Understand	Explain heat transfer, energy interactions, heat engines, refrigeration, and HVAC systems.	PO2(2)	PSO3(2)
CO 1	Understand	Identify the functions and applications of common machine elements.		
CO 1	Understand	Demonstrate mechanical engineering concepts using software, models, simulations, and practical activities with safety and quality considerations.		

Modules

Module - I	INTRODUCTION	L	T	S
		12	0	0
Fundamentals: 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	L	T	S
		12	0	0
First angle projection, Projection of points, straight lines and planes.				
Activities: Demonstration of Simple truss or beam problems solved using software.				
Module – III	PROJECTION OF SOLIDS	L	T	S
		12	0	0
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	L	T	S
		12	0	0
Isometric Scale, Projection of Simple solids.				
Activities: Conversion of 3D into 2D orthographic views, CAD modelling of 3D objects.				
Module - V	PERSPECTIVE PROJECTION	L	T	S
		12	0	0
Simple solids projection				

Activities: Virtual demonstration of perspective views
Project: Development of 2D objects and 3D objects using CAD tools.
Weightage: Continuous Assessment: 50% End Semester Examinations: 50%
Assessment Methodology: Project – 10%, Models - 5%, Assignments - 35% and Internal Examinations - 50%
Text Books: 1. Bhatt N.D. and Panchal V.M., “Engineering Drawing”, Charotar Publishing House, 53rd Edition, 2019. 2. Natrajan K.V., “A Text Book of Engineering Graphics”, Dhanalakshmi Publishers, Chennai, 2018. 3. Parthasarathy, N. S. and Vela Murali, “Engineering Drawing”, Oxford University Press, 2015
Reference Books: 1. BasantAgarwal and Agarwal C.M., “Engineering Drawing”, McGraw Hill, 2nd Edition, 2019. 2. Gopalakrishna K.R., “Engineering Drawing” (Vol. I&II combined), Subhas Publications, Bangalore, 27th Edition, 2017. 3. Luzzader, Warren.J. and Duff,John M., “Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
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/

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Internal Assessment Examinations		End Semester Examination
	CIA - I	CIA- II	
Remember	10	10	20
Understand	20	20	40
Apply	20	20	40
Analyze			
Evaluate			
Create			

U26ADES21	Python Programming (common to AI&DS,BME,CSE,IT,ECE,EEE,MECH)	L	T	P	S	C
Nature of the Course	Engineering Science	3	0	2	0	4
Pre – Requisites						

Course Objectives:

The course is intended to

1. Understand the basic concepts of problem solving, algorithmic thinking, and Python programming.
2. Learn to solve problems using Python data types, expressions, statements, conditions, loops, functions, and string handling.
3. Define and use Python functions to solve problems and develop programming skills using data structures such as lists, tuples, and dictionaries.
4. To familiarize students with file handling, exceptions, modules, packages, and command-line arguments in Python.
5. To develop the ability to apply Python programming techniques to solve computational and real-world problems.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Remember (K1)	Explain the fundamental concepts of algorithms, flowcharts, pseudocode, Python syntax, data types and basic programming constructs.	PO1, PO5	PSO1
CO 2	Understand (K2)	Develop computational problems and describe the use of data types, expressions, operators and control structures in Python programming.	PO1, PO2, PO5	PSO1
CO 3	Apply (K3)	Apply Python programs using control structures, functions and string-manipulation techniques to solve computational problems.	PO1, PO2, PO5	PSO1, PSO2
CO 4	Apply (K3)	Represent and manipulate Python programs using lists, tuples and dictionaries for structured data representation and processing.	PO1, PO2, PO5	PSO1, PSO2
CO 5	Analyze (K4)	Analyze Python programs involving file handling, exception handling, modules and packages to solve practical problems.	PO2, PO5, PO10	PSO1, PSO2

Modules

Module I	Problem Solving and Algorithmic Thinking	L	T	S
		9	0	0
Fundamentals of computing and identification of computational problems; algorithms – building blocks (statements, state, control flow, functions) and representation using pseudocode and flowcharts; algorithmic problem-solving strategies including iteration and recursion; illustrative problems such as finding a minimum, sorted insertion, number guessing and the Towers of Hanoi. Applications: Algorithmic thinking underlies efficient software design, automation and AI/ML pipelines. It's essential for technical interviews, competitive programming and debugging.				
Module II	Fundamentals of Python: Data Types, Expressions and Statements	L	T	S
		9	0	0
Python interpreter, interactive mode and debugging; core data types including int, float, Boolean, string and list; variables, expressions, statements, tuple assignment and operator precedence; illustrative programs on variable exchange, circular shifting of values and distance computation. Applications: Core data types and expressions drive everyday applications like billing systems and calculators. They form the base for every Python program built later.				

Module III	Control Structures, Functions and String Handling	L	T	S
		9	0	0
Conditional statements and iterative constructs (if-Elif-else, while, for, break, continue, pass); functions – parameters, return values, scope, composition and recursion; strings – slicing, immutability and built-in functions/methods; lists as arrays, illustrated through search, GCD, exponentiation and array-summation problems. Applications: Control structures and functions enable decision-making and modular code, used in search and validation systems. String handling powers text processing, form validation and chatbots.				
Module IV	Python Data Structures: Lists, Tuples and Dictionaries	L	T	S
		9	0	0
Lists – operations, slicing, methods, mutability, aliasing and cloning; tuples and dictionaries – operations, methods and use as function arguments/return values; list comprehension for advanced list processing; illustrative programs on sorting, histograms and simple record-processing applications such as marks statements and billing. Applications: Lists, tuples and dictionaries organize real-world data in inventory systems, databases and APIs. They're the foundation for advanced tools like Pandas.				
Module V	File Handling, Modules and Packages in Python	L	T	S
		9	0	0
File handling – reading, writing text files and the format operator; errors and exceptions – types and exception handling; modules, packages and command-line arguments; illustrative programs on word count, file copying and input validation (age and marks-range checks). Applications: File and exception handling ensure programs read/write data reliably without crashing. Modules and packages enable reuse — the same mechanism behind libraries like NumPy and Flask.				

Laboratory Components

S.No	List of Exercises	CO Mapping	RBT
1	Write a program to find the minimum element in a list using a simple search algorithm, after first expressing the logic as pseudocode/flowchart.	CO1, CO2	Apply (K3)
2	Write a recursive program to solve the Towers of Hanoi problem	CO1, CO3	Apply (K3)
3	Write a program to swap the values of two variables (without a third variable) and circulate the values of n variables using tuple assignment.	CO2	Apply (K3)
4	Write a program to compute the distance between two points using arithmetic expressions.	CO2	Apply (K3)
5	Write user-defined functions to implement Linear Search and Binary Search on a list of numbers.	CO3	Apply (K3)
6	Write a program using string slicing and built-in string methods to check whether a given string is a palindrome.	CO3	Apply (K3)
7	Write a program to sort a list of numbers (bubble/selection sort) and generate a histogram of the data using lists.	CO4	Analyze (K4)
8	Write a program using dictionaries to prepare a student mark statement or a retail bill.	CO4	Analyze (K4)
9	Write a program to read a text file and count the number of words in it.	CO5	Apply (K3)
10	Write a program to validate user input (e.g., voter age eligibility or marks in the 0–100 range) using exception handling, demonstrating the use of a Python module.	CO5	Apply (K3)

Total: 30 Periods

Text Books:

1. "Introduction to Computation and Programming Using Python" – John V. Guttag, 3rd Edition (MIT Press) (Module 1)
2. "Think Python: How to Think Like a Computer Scientist" – Allen B. Downey, 3rd Edition (2024, O'Reilly) (Module 2 to 5)
3. Eric Matthes, Python Crash Course: A Hands-On, Project-Based Introduction to Programming, 3rd Edition, No Starch Press, 2023 (Laboratory)

Reference Books:

1. Mark Lutz, Learning Python, 5th Edition, O'Reilly Media, 2013
2. Charles Dierbach, Introduction to Computer Science Using Python: A Computational Problem-Solving Focus, 2nd Edition, Wiley, 2013

E- Resources:

1. Swayam course: Python Essentials: Learn, Build & Apply, https://onlinecourses.swayam2.ac.in/e-learning/preview/ini26_cs03
2. Python Software Foundation, The Python Tutorial. <https://docs.python.org/3/tutorial/>
3. W3Schools, Python Tutorial. <https://www.w3schools.com/python/>

Assessment

Summative assessment				
Bloom's Level	Continuous Assessment			End Semester Examination (Theory)
	Theory Marks		Practical Rubric based CIA	
	CIA - I	CIA - II		
Remember	10	10	10	10
Understand	30	20		42
Apply	20	30		48
Analyze	-	-		-
Evaluate	-	-		-
Create	-	-		-

U26SHEN21	Professional English for Engineers -II (Common to AI&DS, BME, CSE, IT, ECE, EEE, MECH)	L	T	P	S	C
Nature of the Course	Practical (application of speaking skills)	1	0	2	0	2
Pre – Requisites	Basic skills in speaking and writing					

Course Objectives:

The course is intended to

1. Improve the communicative competence of learners with focus on technical and professional contexts.
2. Help learners use language effectively in academic, laboratory, and workplace contexts.
3. Develop various listening strategies to comprehend lectures, discussions, technical descriptions, and authentic media like podcasts and TED Talks.
4. Build on students' English language skills by engaging them in day-to-day speaking activities, presentation skills, and grammar learning activities relevant to authentic engineering contexts.
5. Use language efficiently in expressing their opinions, describing products/processes, and delivering structured technical presentations with content writing and PPT support.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Understand	Interpret general as well as complex technical information and take structured notes.	PO8(2), PO9(3), PO10(3)	
CO 2	Understand	Compare different points of view in a discussion, debate, and panel discussion relevant to engineering.	PO8(2), PO9(3), PO10(3)	
CO 3	Apply	Build fluent and accurate in formal and informal communicative contexts including day-to-day and workplace situations.	PO3(2), PO5(3), PO9(3), PO10(3)	
CO 4	Apply	Utilize appropriate communication strategies to describe products and processes and explain their uses, purposes, precautions, and technical specifications clearly and accurately.	PO3(2), PO8(2), PO9(3), PO10(3)	
CO 5	Create	Design content, prepare PPT and deliver effective technical presentations with confident body language and Q&A handling.	PO6(3), PO7(2), PO8(2), PO9(3), PO10(3), PO11(2)	

Modules

Module - I	Foundations Of Technical Communication & Interpersonal Skills	L	P	S
		3	3	0
Fundamentals of Communication – Definition, Process (Sender-Message-Channel-Receiver-Feedback), Types (Verbal/Non-Verbal, Formal/Informal), Barriers (Semantic, Psychological, Physical) and 7 C's of Effective Communication in Engineering Context. Listening: General & specific details, Telephonic conversation + Speaking: Self-Introduction (Academic & Technical) + Introducing a friend Speaking: Politeness strategies in lab (requests/offers) + Small Talk (canteen/lab) Presentation: 'My Branch & Why I Chose It' – 2 slides, 2 mins Record: Intro video + Telephonic role-play audio				
Module – II	Narration & Summation	L	P	S
		3	3	0
Principles of Listening & Narration – Active vs Passive Listening, Types of Listening (Informational, Critical, Empathetic), Techniques of Note-taking (Cornell, Mind-map), Storytelling Structure (STAR & Chronological) for Technical Narration. Listening: Podcast (BBC 6 Min English) + Speaking: Narrating personal experience – First day in college Speaking: Current vs Permanent situations + Summarizing podcast (1-min summary) Presentation: 'Recent Technology That Inspired Me' – 3 slides, 3 mins Record: Podcast summary + 60 sec narration				
Module – III	Technical Description Of Product & Process	L	P	S
		3	3	0
Techniques of Technical Description – Objectives of Product & Process Description, Language for Definition, Classification, Specifications, Use of Visual Aids (Flowcharts, Diagrams, Pie Charts), Technical Vocabulary for Shapes, Dimensions, Functions & Properties. Listening: Product/process description (Arduino/Water purifier) + Speaking: Picture Description – Circuit/Diagram Speaking: Giving instructions & precautions + Explaining uses/purposes + Shapes/weights/quantities Presentation: 'How Solar Panel/3D Printer Works' – 4 slides with flowchart Record: Product script + PPT + Flowchart				
Module – IV	Functional Communication & Presentation Strategies	L	T	S
		3	3	0
Functional English & Presentation Theory – Functions of Language (Instrumental, Informational, Interactional), Persuasion Techniques (Ethos-Pathos-Logos), Structure of a Technical Presentation (AIDA, Introduction-Body-Conclusion), Principles of Visual Design for PPT (5x5 Rule, Contrast, Alignment). Listening: TED Talk (Julian Treasure) + Speaking: Talking about tasks, progress, plans, deadlines Speaking: Directions in campus/plant + Industrial visit planning + Persuasive speaking Presentation: 'My Dream Industrial Visit to Infosys / Smart Campus Idea' – 5 slides, 4 mins Record: TED review + Dialogue writing				

Module - V	Professional Skills & Advanced Presentation Lab	L	T	S
		3	3	0
Professional Communication & Career Skills – Group Discussion Types & Evaluation Criteria, Debate vs Discussion, Interview Types (HR/Technical), Professional Etiquette, Ethics in Workplace Communication, Handling Q&A and Stage Fear & Body Language Theory.				
Listening: Debate/Panel discussion + Speaking: GD Techniques – Turn-taking, Agreeing/Disagreeing + Making predictions Speaking: Mock Interview (HR & Technical) + Professional Etiquette Presentation: 'Emerging Technology for Social Good / Future of Work / Past-Present-Future of Agriculture' – 6 slides, 5 mins with Content Writing → PPT → Delivery Record: PPT + 250-word content sheet + Final video (Portfolio)				

Laboratory Components

S.No	List of Exercises	CO Mapping	RBT
1	My Branch of Engineering – Scope, Career Opportunities, and My Learning Goals	CO3, CO5	Understand
2	Process Description: How Does a 3D Printer / Water Purifier / Electric Vehicle Work? (With Flowchart)	CO4, CO5	Understand
3	Product Description: Comparative Analysis of Two Gadgets (Mobile Phone vs Laptop)	CO4, CO5	Apply
4	A Recent Technology That Inspired Me (AI, Green Energy, IoT)	CO2, CO5	Understand
5	My Dream Industrial Visit to Infosys (Planning, Learning Outcomes, and Safety Measures)	CO3, CO4, CO5	Create
6	Smart Campus Idea (How to Make My College More Sustainable)	CO4, CO5	Create
7	Lab Safety and Precautions (Workshops and Laboratories)	CO3, CO4	Understand
8	Emerging Technology for Social Good	CO2, CO5	Understand
9	The Past, Present and Future of Agriculture	CO2, CO3, CO5	Understand
10	Future of Work – Skills Required for Engineers in 2030	CO2, CO3, CO5	Apply

Text Books:

1. Praveen Sam, D. & Shoba, K.N. (2020). A Course in Technical English. Cambridge University Press, New Delhi. ISBN: 978-93-86712-65-0
2. Sanjay Kumar & Pushp Lata (2022). Communication Skills for Engineers. 2nd Edition, Oxford University Press, New Delhi. ISBN: 978-0-19-948880-8
3. Anholt, Robert R. H. (2005). Dazzle 'Em With Style: The Art of Oral Scientific Presentation. Elsevier Academic Press. ISBN-10: 0123694523/ISBN-13: 9780123694522

Reference Books:

1. Raman, Meenakshi & Sharma, Sangeeta (2022). Technical Communication: Principles and Practice. 4th Edition, Oxford University Press. ISBN-10: 935497225X/ ISBN-13: 9789354972256
2. Hart, Steve, Aravind R. Nair & Veena Bhambhani (2021/2016). Embark: English for Undergraduates. Cambridge University Press. ISBN-10: 1107647916 ISBN-13: 9781107647915 (Paperback – Cambridge)/e-Book ISBN: 9781108644226
3. Carnegie, Dale (2020). The Art of Public Speaking – For Engineers (Adapted). Most used Indian edition (General Press): ISBN-10: 9388118472/ISBN-13: 9789388118477

E- Resources:**A) E-Sources for Effective Speaking****1. British Council – LearnEnglish – Speaking & Pronunciation**

Speaking fluency, day-to-day conversation, voice modulation
Link1 : <https://learnenglish.britishcouncil.org/skills/speaking>
Link 2: <https://learnenglish.britishcouncil.org/business-english/business-magazine/how-to-improve-speaking>

2. BBC Learning English – The English We Speak / 6 Minute English (Speaking Skills)

For JAM, small talk, persuasive speaking, vocabulary for speaking
YouTube: BBC Learning English Channel
Link: <https://www.bbc.co.uk/learningenglish/english/features/the-english-we-speak>
Podcast: <https://www.bbc.co.uk/learningenglish/podcasts>

3. TED – How to Speak So People Want to Listen + Effective Speaking Playlist

Ideal for presentation voice, body language, storytelling
Talk 1: Julian Treasure – How to speak so that people want to listen
- https://www.ted.com/talks/julian_treasure_how_to_speak_so_that_people_want_to_listen
Playlist: TED Topics – Communication - <https://www.ted.com/topics/communication>
TED-Ed Speaking: <https://ed.ted.com/lessons?category=communication>

B) E-Sources for PowerPoint Presentations**1. Cambridge English – Presentation Skills & Visual Aids Guide**

Structure (Introduction-Body-Conclusion), AIDA, 5x5 Rule
Link: <https://www.cambridgeenglish.org/learning-english/activities-for->

[learners/?skill=writing](#) (Presentation

Writing)

Cambridge Write & Improve – For content writing before PPT

2. Microsoft Support – Create Effective PowerPoint Presentations (Official)

Official guide for PPT design, contrast, alignment, animations, visual design

Link: <https://support.microsoft.com/en-us/powerpoint>

Tips: <https://support.microsoft.com/en-us/office/tips-for-creating-an-effective-presentation-0e0adde2-ff6f-47d2-9cfd-ffbe6f4a843f>

3. YouTube – Effective Presentation & PowerPoint – IITs

YouTube: <https://www.youtube.com/watch?v=4xH2v3u2v2U> (How to Make Effective PPT)

Coursera / YouTube: How to make an effective PowerPoint – <https://www.youtube.com/c/nptelhrd>

Mode	Details
Internal: 20 Marks	Record Completion (All 10 Exercises) (5Marks) + PowerPoint Presentation Preparation & Design (10Marks) + Content Writing Before Delivering a Spoken Presentation – 5M
External: 80 Marks	Viva Voce (30Marks) + Speaking Skills Assessment (50Marks)

U26ECPC22	DEVICES AND CIRCUITS LABORATORY	L	T	P	S	C
Nature of the Course	Professional Core	0	0	2	0	4
Pre – Requisites	Basic Electrical Engineering, Semiconductor Physics					

Course Objectives

At the end of this laboratory course, students will be able to:

1. Understand and analyze the characteristics and applications of semiconductor devices such as PN junction diodes, Zener diodes, BJTs, FETs, and SCRs.
2. Develop practical skills in constructing and testing electronic circuits such as rectifiers, clippers, clampers, and voltage regulators.
3. Verify experimentally fundamental electrical network theorems and laws including KVL, KCL, Thevenin's, Norton's, Superposition, Maximum Power Transfer, and Reciprocity theorems.
4. Analyze experimentally the resonance and transient characteristics of RLC, RL, and RC circuits.
5. Interpret experimental results and compare practical observations with theoretical concepts.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Apply	Perform experiments to obtain and analyze the V-I characteristics of PN junction diodes and Zener diodes, and study the voltage regulation characteristics of Zener diode regulators.	PO1, PO2, PO4	PSO1
CO 2	Analyze	Determine and analyze the input and output characteristics of BJT configurations, including Common Emitter and Common Base configurations.	PO1, PO2, PO4	PSO1
CO 3	Analyze	Perform and analyze the characteristics of semiconductor devices such as FET and SCR under different operating conditions.	PO1, PO2, PO4	PSO1
CO 4	Apply	Construct and test electronic circuits including clippers, clampers, and full-wave rectifiers, and analyze their input-output waveforms.	PO1, PO2, PO3, PO4	PSO1, PSO2
CO 5	Apply	Experimentally verify fundamental electrical laws and network theorems including KVL, KCL, Thevenin's, Norton's, Superposition, Maximum Power Transfer, and Reciprocity theorems.	PO1, PO2, PO4	PSO1
CO 6	Analyze	Determine the resonance frequency of series and parallel RLC circuits and analyze the transient response of RL and RC circuits.	PO1, PO2, PO4	PSO1

List of Experiments

S.No	Exercises	CO Mapping	Bloom's Level
1	Characteristics of PN Junction Diode	CO 1	Apply
2	Zener diode Characteristics & Regulator using Zener diode	CO 2	Analyze
3	Common Emitter input-output Characteristics	CO 2	Analyze
4	Common Base input-output Characteristics	CO 2	Analyze
5	FET Characteristics	CO 3	Analyze
6	SCR Characteristics	CO 3	Analyze
7	Clipper and Clamper & FWR	CO 4	Apply
8	Verifications Of Thevinin & Norton theorem	CO 4	Apply
9	Verifications Of KVL & KCL	CO 4	Apply
10	Verifications Of Super Position Theorem	CO 5	Apply
11	Verifications of maximum power transfer & reciprocity theorem	CO 5	Apply
12	Determination Of Resonance Frequency of Series & Parallel RLC Circuits	CO 5	Apply
13	Transient analysis of RL and RC circuits	CO 6	Analyze

List of Equipment for a Batch of 30 Students

S.No	Description	Particulars
1.	BC 107, BC 148, 2N2646, BFW10	25 each
2.	1N4007, Zener diodes	25 each
3.	Resistors, Capacitors, Inductors	Sufficient quantities
4.	Bread Boards	15 Nos
5.	CRO (30MHz)	15 Nos.
6.	Function Generators (3MHz)	10 Nos.
7.	Dual Regulated Power Supplies (0 – 30V)	10 Nos.

Total: 60 Periods

E- Resources:

NPTEL Courses: Basic Electronics and Lab – IIT Madras; Basic Electrical Circuits – IIT Madras; Basic Electronics – IIT Bombay; Basic Electric Circuits – IIT Kanpur.

Assessment

Summative Assessment based on Continuous and End Semester Examination		
Bloom's Level	Rubric based Continuous Assessment [50 marks]	End Semester Examination [50 marks]
Remember		
Understand		
Apply	27	27
Analyze	23	23
Evaluate		
Create		

U26SHMC21	HUMAN VALUES AND PROFESSIONAL EXCELLENCE - II	L	T	P	S	C
Nature of the Course	Humanities and social science	1	0	2	1	1
Pre – Requisites	None					

Course Objectives:

The course is intended to

1. Develop healthy, safe and sustainable habits for personal well-being and responsible adulthood.
2. Strengthen values, ethical reasoning and resilience in responding to everyday and professional challenges.
3. Develop interpersonal communication and relationship-management skills based on empathy, respect and emotional intelligence.
4. Develop the ability to design and deliver clear, audience-centred and ethical professional presentations.
5. Develop teamwork, leadership, collaboration and responsible influence skills for effective group performance.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Apply (K3)	Apply habit-development, health, safety and well-being practices to personal life.	PO6, PO8, PO12	
CO 2	Analyze (K4)	Analyze personal and professional situations using values, ethical reasoning and resilient responses.	PO6, PO8, PO9, PO10	
CO 3	Apply (K3)	Demonstrate empathetic communication, relationship-management and conflict-resolution skills.	PO6, PO8, PO9, PO10	
CO 4	Create (K6)	Create and deliver an effective professional presentation suited to an identified audience and purpose.	PO10, PO12	
CO 5	Evaluate (K5)	Evaluate team processes and contribute responsibly to collaborative work through leadership, trust and accountability.	PO8, PO9, PO10, PO12	

Modules

Module – I	HABITS, HEALTH AND PERSONAL SAFETY	L	T	S
		3	0	3
Habit formation and behaviour change; health management; responsible adulthood and handling adolescent concerns; habit versus addiction; basic awareness of human physiology; healthy routines through yoga, meditation, sports, fitness, sleep management and balanced nutrition. Prevention of smoking, alcohol, drug misuse and violence; physical, emotional and social safety; responding to harassment or assault; cybercrime awareness; road safety; responsible help-seeking and support systems. Activity: Prepare and monitor a personal habit-development and well-being plan.				

Module – II	VALUES, ETHICS AND RESILIENT LIVING	L	T	S
		3	0	3

Self-respect, punctuality, respect for others, nonviolence, truthfulness, empathy, honesty, integrity and self-discipline. Happiness and well-being; constructive responses to failure, obstacles, criticism and insults; managing fear, anger, jealousy, hatred, greed, sorrow and unhealthy desires. Ethical choices in personal and professional life; critical appreciation of Indian culture, knowledge traditions and scientific heritage. Activity: Analyze value-based and ethical dilemmas through guided case discussions and reflection.

Module – III	INTERPERSONAL RELATIONSHIPS AND COMMUNICATION	L	T	S
		3	0	3

Types of relationships; factors influencing relationships; barriers to relationship management; communication, active listening and feedback. Emotional intelligence in relationship management; empathy, trust and mutual respect; personal boundaries, consent and respectful conduct; conflict resolution; personality differences and style flexing; inclusive communication. Activity: Role-play exercises on listening, empathy, boundary-setting and conflict resolution.

Module – IV	PRESENTATION AND PROFESSIONAL COMMUNICATION SKILLS	L	T	S
		3	0	3

Purpose, occasion and audience analysis for presentations; planning and organizing content; elements of an effective presentation; verbal, non-verbal and voice management; visual aids and basic slide-design principles; developing and delivering presentations; handling questions; persuasive and ethical communication; self- and peer-feedback. Activity: Prepare and deliver an individual professional presentation with peer evaluation.

Module – V	TEAMWORK, LEADERSHIP AND COLLABORATION	L	T	S
		3	0	3

Roles of team builder, team manager and team member; team formation, norms and dynamics; synergy, bonding and alignment; trust, psychological safety and accountability. Qualities of effective team members; characteristics of high-performance teams; collaboration in diverse and digital teams; persuasion versus manipulation; responsible influence, negotiation and shared decision-making; managing team conflict. Activity: Plan, execute and reflect on a team-based task with peer assessment.

Text Books:

1. Trainer and Faculty Lecture Notes / PPT

Reference Books:

1. James Clear, Atomic Habits, Random House Business Books, 2018.
2. Refe Dale Carnegie, The Art of Public Speaking, Rupa Publications India, 2018.
3. John C. Maxwell, Teamwork 101: What Every Leader Needs to Know, HarperCollins Leadership, 2009.

E- Resources:

1. https://fdp-si.aicte-india.org/5day_onlineUHV.php
2. <https://www.skillsyouneed.com/ps/personal-development.html>
3. <https://www.jobscan.co/blog/5-interpersonal-skills-you-need-on-your-resume/#What-are-interpersonal-skills?>
4. <https://jamesclear.com/articles>

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Bloom's Category	Internal Assessment Examinations		End Semester Examination
	CIA - I	CIA - II	
Remember	10	10	20
Understand	15	20	35
Apply	25	20	45
Analyze			
Evaluate			
Create			

U26SHEE21	APTITUDE SKILL (Common to AI&DS, BME, CSE, IT, ECE, EEE, MECH)	L	T	P	S	C
Nature of the Course	Basic Aptitude	0	0	2	0	1
Pre – Requisites	-					

Course Objectives:

The course is intended to

1. To know different methods for faster numerical computations
2. To learn logical reasoning skills.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Understand	Explain different techniques used for faster calculations.	PO1(3)	PSO 2
CO 2	Understand	Explain the methods used to solve mathematical problems through logical thinking.	PO1(3)	PSO 2

Modules

Module - I	MATHS MINDS	L	T	S	P
		0	0	0	7
Finding Square roots of numbers faster (L2) - Finding Cube roots faster (L2) - Solving simultaneous equations faster than conventional methods (L2)-Percentage(L2).					
Module – II	FUNDAMENTALS OF NANO CHEMISTRY	L	T	S	P
		0	0	0	8
Alphabet and Number Series (L2) - Odd Man Out Series (L2) – Puzzles -Blood Relations (L2) - Seating Arrangement and Ordering (L2) - Directional Sense Test (L2)-Dice(L2)- Number series(L2)- Simplification(L2).					

Text Books:

1. Aggarwal R. S., “Quantitative Aptitude for Competitive Examinations”, S. Chand Publishing Company Ltd(s), 2022.
2. Arun Sharma, “How to prepare for Quantitative Aptitude for the CAT” Tata McGraw-Hill Publishing, 2022.

Reference Books:

1. Aggarwal R. S., “Quantitative Aptitude for Competitive Examinations”, S. Chand Publishing Company Ltd(s), 2022.
2. Praveen R. V., “Quantitative Aptitude and Reasoning” PHI Learning Pvt. Ltd., 2016
3. Arun Sharma, “How to prepare for Quantitative Aptitude for the CAT” Tata McGraw-Hill Publishing, 2022.

E- Resources:

1. Quantitative Aptitude Test Prep Courses – <https://www.udemy.com/topic/quantitative-aptitude-test-prep/>
2. Quantitative Aptitude Basics – <https://www.mygreatlearning.com/academy/learn-for-free/courses/quantitative-aptitude-basics>.
3. Quantitate aptitude - <https://www.btechguru.com/courses--bodhbridge--quantitative-aptitude-- 22.html>.

Assessment

Formative assessment			
Bloom's Level	Assessment Component	Marks	Total marks
Knowledge Demonstration			
Remember	Quiz	5	10
Understand	Tutorial Class / Assignment		
	Attendance	5	

Summative Assessment			
Bloom's Category	Internal Assessment Examinations		End Semester Examination
	CIA - I	CIA - II	
Remember			
Understand	50	50	100
Apply			
Analyze			
Evaluate			
Create			

U26SHPY21	Physical Education and Yoga- II	L	T	P	S	C
Nature of the Course	Basic Physical Education	0	0	4	0	1
Pre – Requisites	-					

Course Objectives:

The course is intended to

1. To impart the fundamentals of physical education for development of students' physical, mental, and social well-being
2. To instil a lifelong appreciation for physical activity towards the development of positive attitude and fostering values of team work and sportsmanship.

Course Outcomes:

On successful completion of the course, students will be able to

S.No	Bloom's Level	Course Outcome	PO	PSO
CO 1	Understand	Understand and explain the importance of physical activity for mental and physical health.	-----	
CO 2	Understand	Apply safety principles and methods during sports activities	PO1(3)	
CO 3	Understand	Develop teamwork, discipline, and leadership through sports and group activities and collaborate effectively.	PO8(3)	
CO 4	Understand	Demonstrate the advanced technical skills and strategic understanding in the game of their interest.	PO11(2)	
CO 5	Understand	Demonstrate the advanced technical skills and strategic understanding in the yoga and their efficiency	PO11(2)	

Modules

Module - I	Basic gymnastics exercises	L	T	S
		0	0	0
Warming up, Suitable exercise, Lead up games, Safety education, Movement education, Balanced Walk, execution, floor exercise, tumbling/acrobatics, grip, release, swinging, parallel bar exercise, horizontal bar exercise, flic-flac-walk and pyramids.				
Module – II	Upskilling in any one of the athletics	L	T	S
		0	0	0
Broad Jump, High Jump, Triple Jump, Relay Sprints, Javelin Throw, Discuss Throw, Shot Put, Short and Long-distance Running. Advance skills in any one of the indoor/outdoor games, which has been opted by the student in the I semester.				
Module – III	Skill development in any one of the following outdoor games:	L	T	S
		0	0	0
Basket Ball, Volley Ball, Ball Badminton, Football, Hockey, Kho-Kho, Kabaddi, Cricket, Hand ball and Tennis.				
Module – IV	Personality development in any one of the following out Yoga	L	T	S
		0	0	0
Personality Development (1) Verbal and Non-Verbal Communication (2) Holistic Health Care (3) Positive Thinking (4) Power of Youth (5) Drug Awareness Mind Power of Mind – Different states of Mind – Sanskar – Re-engineering – Mental Health for Better Living.				
Module - V	Role of Yoga in Diseases Yogic Concept of Human Body	L	T	S
		0	0	0
Role of Yoga in Diseases Yogic Concept of Human Body – Five koshas – Asthma – Diabetes – Hypertension Obesity – coronary heart disease – Arthritis.				
Text Books:				
1. Singh, A. (2008). Essentials of physical education. Kalyani Publishers. 2. Mangal, S. K. (2009). <i>Psychology of sports performance</i>. Sports Publication.				
E- Resources:				
1. https://www.who.int/health-topics/physical-activity				