SCMS SCHOOL OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)
Vidya Nagar, Palissery, Karukutty, Ernakulam - 683576, Kerala, India.
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SCMS SCHOOL OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

VIDYA NAGAR, PALISSERY, KARUKUTTY - 683576

DEPARTMENT OF MECHANICAL ENGINEERING

2026 Scheme

Syllabus

Semester 1

B.Tech. in Mechanical Engineering

Branch Code – ME

SEMESTER 1

Sl. No	Slot	Course Code	Type	Cat.	Course Title	Cr.	Hour Structure				Total Hrs.	Internal Test		CIA	SEE	Overall Marks
							L	T	P	SL		IA-1	IA-2			
1	A	26GYMAT101	BSC	GC	Matrices, Ordinary Differential Equations and Transforms	3	45	0	0	45	90	40	40	40	60	100
2	B	26GCPHT121 / 26GCCYT122	BSC	GC	Physics for Physical Science / Chemistry for Physical Science	4	45	0	30	45	120	40	40	40	60	100
3	C	26GCEST103	ESC	GC	Engineering Mechanics	3	45	0	0	45	90	40	40	40	60	100
4	D	26GCEST104	ESC	GC	Introduction to Mechanical and Civil Engineering	4	60	0	0	60	120	40	40	40	60	100
5	E	26UCEST105	ESC	UC	Programming in C	4	45	0	30	45	120	40	40	40	60	100
6	F	26GCESL106	ESC	GC	Basic Engineering workshop	1	0	0	30	0	30			50	50	100
7	G	26UCHWT127	HWP	CC	Health and Wellness	1	0	0	30	0	30	-	-	50	0	50
		26UCHUT128	HMC		Life Skills and Professional Communication									100	0	100
8		26UCSEM129	SEC	MC	MOOC Course/Communicative English (8 WEEKS)	0	0	0	0	0	0	-	-	-	-	-
TOTAL						20	240	0	120	240	600					
Bridge Course: Total 15 Hours																

Course Code	26GYMAT101		
Course Name	MATRICES, ORDINARY DIFFERENTIAL EQUATIONS AND TRANSFORMS		
Teaching Hours	L:45 T:0 P:0 SL:45	**Course Credits**	3
Continuous Internal assessment Marks	40	**Semester End Exam Marks**	60
Exam Hours	2½ Hours	**Total Marks**	100
Course Type	BSC: Theory	**Course Category**	GC (Group B&C)
Prerequisites	NIL		

Preamble

This course aims to provide students with a strong mathematical foundation in linear algebra, differential equations, transform techniques, and series representations. It equips students with analytical and problem-solving skills required to model, analyze, and solve engineering and computational problems using appropriate mathematical methods.

Course Objectives

1. To provide students with a strong foundation in linear algebra and ordinary differential equations for modelling and solving engineering and computational problems.
2. To introduce and demonstrate the application of Laplace transform techniques for solving initial value problems and analysing engineering systems involving differential equations.
3. To familiarize students with and demonstrate the use of Taylor and Maclaurin series, Fourier series, and related mathematical techniques for representing functions and addressing engineering applications involving periodic phenomena.

Course Outcomes (COs)

CO#	CO Statement	Knowledge Level
CO1	Apply matrix techniques to solve systems of linear equations, determine the rank of a matrix, analyze the existence and uniqueness of solutions, and compute eigenvalues, eigenvectors, and matrix diagonalization for engineering applications.	K3
CO2	Apply analytical methods to solve homogeneous and non-homogeneous second-order linear ordinary differential equations with constant coefficients, including initial value problems, using the methods of undetermined coefficients and variation of parameters.	K3

CO3	Apply the properties of Laplace transforms, including linearity, first and second shifting theorems, transforms of derivatives, and unit step functions, to obtain the Laplace transforms and inverse Laplace transforms of functions.	K3
CO4	Solve second-order linear initial value problems with constant coefficients using Laplace transforms and determine inverse Laplace transforms of product functions using the convolution theorem.	K3
CO5	Apply Taylor and Maclaurin series expansions, and Fourier series techniques, including full-range and half-range expansions, to represent functions and solve engineering and mathematical problems	K3

Course Articulation Matrix

CO-PO-PSO Mapping

	PROGRAM OUTCOMES											**PSOs**		
CO #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**1**	**2**	**3**
CO1	3	3	-	2	-	-	-	-	-	-	2	-	-	-
CO2	3	3	-	2	-	-	-	-	-	-	2	-	-	-
CO3	3	3	-	2	-	-	-	-	-	-	2	-	-	-
CO4	3	3	-	2	-	-	-	-	-	-	2	-	-	-
CO5	3	3	-	2	-	-	-	-	-	-	2	-	-	-
Avg	**3**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation,

Course Syllabus

Module: 1	**Contact Hours: 9**
Linear systems of equations: Gauss elimination, Row echelon form, Rank of a matrix, Solutions of linear systems: Existence, Uniqueness (without proof). The matrix Eigen Value Problem, Determining Eigen values and Eigen vector, Diagonalization of matrices.	

Module: 2	**Contact Hours: 12**
Homogeneous linear ODEs of second order, Superposition principle, General solution, Homogeneous linear ODEs of second order with constant coefficients (Method to find general solution, solution of linear Initial Value Problem). Non homogenous ODEs (with constant coefficients) - General solution, Particular solution by the method of undetermined coefficients (Particular solutions for the functions ke^{ax}, kx^{n}, $kcos\omega x$, ks , $ke^{ax}cos\omega x$, $ke^{ax}sin\omega x$), Initial value Problem for Non-Homogeneous Second order linear ODE(with constant coefficients), Solution by variation of parameters (Second Order).	

Module: 3	**Contact Hours: 14**
Laplace Transform, Inverse Laplace Transform, Linearity property, First shifting theorem, Transform of derivatives, Solution of Initial value problems by Laplace transform (Second order linear ODE with constant coefficients with initial conditions at t=0 only), Unit step function, Second shifting theorem, (Initial value problems involving unit step function is excluded), Convolution theorem (without proof) and its application to finding inverse Laplace transform of products of functions.	

Module: 4	**Contact Hours: 10**
Taylor series representation (without proof, assuming the possibility of power series expansion in appropriate domains), Maclaurin series representation, Fourier series, Euler formulas, Convergence of Fourier series (Dirichlet's conditions), Fourier series of 2π periodic functions, Fourier series of 2l periodic functions, Half range sine series expansion, Half range cosine series expansion.	

Continuous Internal Assessment (CIA)

Attendance	**CTA**	**IAT 1 (MOD 1&2)**	**IAT 2 (MOD 3&4)**	**Total**
5	15	10	10	40

Suggested Assignments for Course Teacher's Assessment (CTA) Through Self-Learning Component:

1. Explore real-world applications of systems of linear equations in engineering and computer science.
2. Investigate applications of second-order differential equations in mechanical vibrations, electrical RLC circuits, and population dynamics.
3. Learn numerical solution methods for ODEs using online simulation tools
4. Explore the role of Laplace transforms in control systems, signal processing, and electrical engineering. Study the use of convolution in system response analysis and digital signal processing.
5. Study applications of Fourier series in signal processing, image processing, heat conduction, and communication systems.

Text Books

1. Advanced Engineering Mathematics, Erwin Kreyszig, John Wiley & Sons, 10th edition, 2016.
2. Calculus by H. Anton, I. Biven, S.Davis, Wiley, 12th edition, 2024.

Reference Books and Extended Learning

1. Thomas' Calculus by Maurice D. Weir, Joel Hass, Christopher Heil, Przemyslaw Bogacki, Pearson, 15th edition,2023
2. Elementary Linear Algebra by Howard Anton, Chris Rorres Wiley, 11th edition,2019.
3. NPTEL Repository: **https://nptel.ac.in/courses/111106051**
4. NPTEL Repository: **https://nptel.ac.in/courses/111108081**
5. NPTEL Repository: **https://nptel.ac.in/courses/111106111**

Course Code	26GCPHT121		
Course Name	PHYSICS FOR PHYSICAL SCIENCE		
Teaching Hours	L:45 T:0 P:30 SL:45	**Course Credits**	4
Continuous Internal assessment Marks	40	**Semester End Exam Marks**	60
Exam Hours	2½ Hours	**Total Marks**	100
Course Type	BSC: Integrated: Theory & Lab	**Course Category**	GC: Group C
Prerequisites	Students should have a foundational understanding of higher secondary Physics.		

Preamble

This integrated theory and laboratory course establishes a solid scientific foundation for physical science students. By exploring mechanical oscillations, wave mechanics, acoustics, fluid dynamics, and thermodynamics, students gain essential analytical skills. The curriculum further emphasizes the properties and biomedical applications of advanced engineering materials to solve complex engineering problems

Course Objectives

1. To introduce the fundamental concepts of mechanical and electrical oscillations, including damped and forced oscillations, resonance, and their electrical analogies.
2. To familiarize students with wave motion, the mathematical treatment of the wave equation, and the principles of architectural and ultrasonic acoustics.
3. To impart knowledge of the elastic and thermal behavior of matter, covering stress-strain relationships, bending, torsion, and modes of heat transfer.
4. To expose students to the synthesis, properties, and biomedical applications of modern engineering materials such as metallic glasses, shape memory alloys, and biomaterials.

Course Outcomes (COs)

CO#	CO Statement	Knowledge Level
CO1	Formulate and solve the differential equations governing damped and forced harmonic motion, and classify the physical regimes of under-damped, critically-damped, and over-damped systems.	K3
CO2	Solve the one-dimensional wave equation for a stretched string and apply the derived solutions to analyze transverse and longitudinal wave propagation in mechanical systems.	K3
CO3	Calculate the reverberation time of architectural spaces using Sabine's formula to determine acoustical requirements, and apply the principles of ultrasonic wave generation to solve specific non-destructive testing (NDT) and medical imaging problems.	K3
CO4	Explain the mechanical, fluid, and thermal properties of materials through the interpretation of experiments involving torsional pendulum, bending of beams, viscosity, surface tension, and thermal conductivity measurements.	K2
CO5	Classify metallic, ceramic, and polymeric biomaterials based on biocompatibility criteria, and compare the physical, chemical, magnetic properties, and fabrication methods of advanced functional materials like metallic glasses and shape-memory alloys.	K3
CO6	Apply basic knowledge of principles and theories in physics to conduct experiments.	K3

Course Articulation Matrix

CO-PO-PSO Mapping

	PROGRAM OUTCOMES											PSOs		
CO #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**1**	**2**	**3**
CO1	3	2	-	-	-	-	-	1	-	-	2	-	-	-
CO2	3	2	-	-	-	-	-	1	-	-	2	-	-	-
CO3	3	2	-	-	-	-	-	1	-	-	2	-	-	-
CO4	3	2	-	-	-	-	-	1	-	-	2	-	-	-
CO5	3	2	-	-	-	-	-	1	-	-	2	-	-	-
CO6	3	2	-	-	-	-	-	3	-	-	2	-	-	-
Avg	**3.0**	**2.0**	**-**	**-**	**-**	**-**	**-**	**1.33**	**-**	**-**	**2.0**	**-**	**-**	**-**

Course Syllabus

Module: 1	Contact Hours: 12

Oscillations

Harmonic oscillations, Damped harmonic motion-Derivation of differential equation and its solution, Over damped, Critically damped and Under damped Cases, Quality factor-Expression, Forced oscillations, Differential Equation-Derivation of expressions for amplitude and phase of forced oscillations, Amplitude Resonance-Expression for Resonant frequency, Quality factor and Sharpness of Resonance, Electrical analogy of mechanical oscillators.

Module: 2	Contact Hours: 11

Waves and Acoustics

Wave motion, Derivation of one dimensional wave equation and its solution, Distinction between transverse and longitudinal waves, Transverse vibration in a stretched string, Statement of laws of vibration.

Reverberation and echo, Reverberation time and its significance - Sabine's Formula (No derivation), Factors affecting acoustics of a building. Ultrasonic: Production of Ultrasonic, Piezoelectric and magneto-striction oscillator, Detection: Kundt's tube method and Piezo-electric detector, Application: NDT, Sonogram, Ultrasonic cleaning.

Module: 3	Contact Hours: 11

Properties of Matter

Elasticity: Elasticity, Hooke's law, Poisson's ratio, stress-strain diagram, factors affecting elastic modulus and tensile strength. Torsional stress and deformations, twisting couple, torsion pendulum (theory), Bending moment: cantilever and uniform bending (theory), I shaped girders.

Thermal conductivity: Thermal conductivity, Modes of heat transfer, Lee's disc methods, Thermal expansion of solids, bimetallic strips, Applications.

Module: 4	Contact Hours: 11

Modern Engineering Materials

Metallic glasses, Types, Preparation: Melt Spinning, Properties and Applications. Shape Memory Alloys, Phases, Characteristics, shape memory effect, Applications, Biomaterials, Criteria, Metallic Biomaterials, Ceramic and Glass Biomaterials, Polymeric Biomaterials, Longer-lasting Medical Implants, Titanium and Titanium Alloys.

Sl No.	List of Experiment	Contact Hours: 30 hrs.
1	Perform an error analysis for the measurements obtained using the Vernier calipers, screw gauge, travelling microscope, and spectrometer by calculating the mean value, absolute error, relative error, and percentage error from repeated observations	
2	LCR circuit –forced and damped harmonic oscillations	
3	Determine the acceleration due to gravity (g) using a simple pendulum.	
4	Determine the modulus of rigidity of the material of the suspension wire using a torsion pendulum.	
5	Melde's experiment- Frequency calculation in Transverse and Longitudinal Mode	
6	CRO -Measurement of frequency and amplitude of wave forms	
7	Optical fiber characteristics- Measurement of Numerical aperture	
8	Diode characteristics	
9	Characteristics of LED	
10	Solar Cell- V-I and Intensity Characteristics	
11	Laser – Determination of wavelength using diffraction grating	
12	Determine the Young's modulus of the material of the given cantilever beam using the cantilever method.	

Continuous Internal Assessment (CIA)

Attendance	CTA	IAT 1 (MOD 1&2)	IAT 2 (MOD 3&4)	IAT 3 (Lab)	Total
5	5	10	10	10	40

Suggested Assignments for Course Teacher's Assessment (CTA) Through Self-Learning Component:

The following self-learning activities are indicative and not exhaustive. Course instructors shall facilitate, mentor, and monitor student groups in planning, implementing, and documenting these activities to achieve the intended Course Outcomes.

1. Generate a Python script simulating structural dampening case studies (under, critical, and over-damped). Instruct the AI to map these variations against real-world mechanical shock absorbers or seismic dampers in civil infrastructure to visually plot the decay curves.
2. Prompt an AI tool to calculate the required architectural modifications needed to bring a noisy hall's reverberation time down using Sabine's formula. Have the AI generate an absorption coefficient matrix for alternative civil materials, and critically audit its calculation accuracy.
3. Input a prompt into an AI tool requesting a comprehensive structural stress-strain comparison between standard concrete beams and steel I-girders under uniform bending. Direct the AI to highlight how Poisson's ratio dictates shear failure lines under load.
4. Instruct an AI tool to generate a design proposal utilizing Shape Memory Alloys (SMAs) for self-healing automotive bumpers or temperature-actuated bimetallic valves. Have the AI summarize the phase transition parameters and write a critique on its real-world implementation constraints.

Text Books

1. M. N. Avadhanulu, P. G. Kshirsagar, T. V. S. Arun murthy (2018). A Textbook of Engineering Physics, 11th Edition S. Chand.
2. Gaur, R. K., & Gupta, S. L. (2022). Engineering physics. Dhanpat Rai Publications.
3. D.K. Bhattacharya & Poonam Tandon (2024)A Textbook of Engineering Physics. Oxford University Press.

Reference Books and Extended Learning

1. S.O. Pillai (2022). Solid State Physics, 10th Edition, New age international publishers.
2. Arthur Beiser (2003). Concepts of Modern Physics, 6th Edition, Tata McGraw Hill Publications.
3. Charles Kittel (2019). Introduction to Solid State Physics, Wiley India Edition.
4. NPTEL Video Repository: https://nptel.ac.in/courses/115106119
5. NPTEL Video Repository: https://nptel.ac.in/courses/112106225
6. NPTEL Video Repository: https://nptel.ac.in/courses/105105177
7. NPTEL Video Repository: https://nptel.ac.in/courses/113105081

Course Code	26GCEST103		
Course Name	ENGINEERING MECHANICS		
Teaching Hours	L:45 T:0 P:0 SL:45	**Course Credits**	3
Continuous Internal Evaluation Marks	40	**End Semester Exam Marks**	60
Exam Hours	2½ Hours	**Total Marks**	100
Course Type	ESC	**Course Category**	GC (Group C)
Prerequisites	Nil		

Preamble

The goal of this course is to expose the students to the fundamental concepts of mechanics and enhance their problem-solving skills. It introduces students to the influence of applied force systems and the geometrical properties of the rigid bodies while stationary or in motion. After this course, students will be able to recognise similar problems in real-world situations and respond accordingly.

Course Objectives

1. To introduce force systems and equilibrium of rigid bodies using free body diagrams and Lami's theorem
2. To enable the students to analyse friction in blocks and ladders, and determine beam support reactions.
3. To enable the students to evaluate centroids and moments of inertia of composite areas and forces in space.
4. To enable the students to apply kinematics and kinetics principles to rectilinear and rotational motion of rigid bodies.

Course Outcomes (COs)

CO	CO Statement	Knowledge Level
CO1	Classify force systems and determine the resultant of coplanar forces using composition, resolution, and the laws of the parallelogram and triangle of forces.	K2

CO2	Apply conditions of equilibrium, Lami's theorem, free body diagrams, and Varignon's theorem to solve problems involving moments and couples on rigid bodies.	K3
CO3	Analyze friction problems involving blocks and ladders, and calculate support reactions for simply supported beams under point loads and UDL.	K4
CO4	Determine the centroid and moment of inertia of composite areas using parallel and perpendicular axis theorems, and analyze forces and equilibrium of bodies in space.	K4
CO5	Solve problems on rectilinear and rotational motion of rigid bodies using equations of kinematics, kinetics, and D'Alembert's principle.	K3

Course Articulation Matrix

CO-PO-PSO Mapping

	PROGRAM OUTCOMES											PSOs		
CO #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**1**	**2**	**3**
CO1	3	2	2	-	-	-	-	-	-	-	-	-	-	-
CO2	3	3	2	-	-	-	-	-	-	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	-	-	-	-	-	-
CO4	3	2	2	-	-	-	-	-	-	-	-	-	-	-
CO5	3	3	2	-	-	-	-	-	-	-	-	-	-	-
Avg	**3.0**	**2.6**	**2.0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation, NA: Not Applicable

Course Syllabus

Module: 1	**Contact Hours: 12**
Mechanics: Definition and Classification- Statics and Dynamics- Introduction to rigid body concept. Force systems: classification- collinear, coplanar, concurrent, non-concurrent, parallel, and non-coplanar force systems. Forces in 2D- Composition and resolution of forces in two-dimensional systems.	

Parallelogram law of forces and triangle law. Determination of magnitude and direction of resultant force (Numerical Problems) Conditions of equilibrium of rigid bodies in two dimensions, and Lami's Theorem (Numerical Problems) Concept of free body diagram (Numerical Problems). Concept of moment of force, couple and principle of moments-Varignon's theorem (Numerical Problems)

Module: 2	**Contact Hours: 11**
Introduction to friction: laws of friction, angle of friction, cone of friction, angle of repose, Derivation of the relation between the angle of friction and the angle of repose. Friction – Block friction and ladder friction (Numerical problems) Types of beam and types of support- Support reaction of a simply supported beam (Point load and UDL only) (Numerical problems)	

Module: 3	**Contact Hours:11**
Centroid of composite areas (Numerical problems). Parallel axis theorem, Perpendicular Axis theorem, Polar moment of Inertia, Radius of gyration Moment of Inertia of composite areas (Numerical problems). Mass moment of inertia (disc and ring) (concept only) Forces in space- Vector representation of forces, Resultant of a system of force in space, Equilibrium of forces in space (concept only)	

Module: 4	**Contact Hours: 11**
Rectilinear translation: Equations of motion in kinematics and kinetics (Numerical problems) D' Alembert's principle, Motion on horizontal and inclined surface, Motion of connected bodies (Numerical problems) Rotation- Kinematics of rotation (Numerical problems), Equation of motion for a rigid body rotating about a fixed axis. (Numerical problems). Rotation under a constant moment (concept only)	

Continuous Internal Assessment (CIA)

Attendance	CTA	IAT 1 (Module 1&2)	IAT 2 (Module 3&4)	Total
5	15	10	10	40

Suggested Assignments for Course Teacher's Assessment (CTA) Through Self-Learning Component:

1. History and applications of mechanics in modern engineering (aerospace, robotics, civil structures)
2. Polar moment of inertia and its application in shaft design (self-study before classroom discussion)
3. Concept of cone of friction and its real-life applications (clutches, brakes)
4. Rotation under constant moment — derivation and real-world examples (flywheels, turbines)

Text Books

1. Timoshenko, S., & Young, D. H. (2017). Engineering mechanics. 5th ed., McGraw Hill Publishers.
2. Hibbeler, R. C. (2015). Engineering mechanics: Combined statics and dynamics. 14th ed., Pearson Education.
3. Shames, I. H. (2008). Engineering mechanics: Statics and dynamics. 4th ed., Prentice Hall of India.
4. Bansal, R. K. (2016). Textbook of engineering mechanics. 4th ed., Laxmi Publications Pvt. Ltd.

Reference Books and Extended Learning

1. Merriam J. L and Kraige L. G., Engineering Mechanics - Vols. 1 and 2, John Wiley.
2. Tayal A K, Engineering Mechanics – Statics and Dynamics, Umesh Publications
3. Bhavikkatti, S.S., Engineering Mechanics, New Age International Publishers

Online Repository

1. https://nptel.ac.in/courses/112106286
2. https://nptel.ac.in/courses/112103108

Course Code	26GCEST104		
Course Name	INTRODUCTION TO MECHANICAL AND CIVIL ENGINEERING		
Teaching Hours	L:60 T:0 P:0 SL:60	**Course Credits**	4
Continuous Internal Evaluation Marks	40	**End Semester Exam Marks**	60
Exam Hours	2½ Hours	**Total Marks**	100
Course Type	Theory	**Course Category**	GC - Group C
Prerequisites	None		

Preamble

This course introduces students to the fundamentals of Civil and Mechanical Engineering. It highlights the role of Civil Engineering in developing infrastructure for societal needs and provides an overview of the basic principles of Mechanical Engineering. The course aims to build interdisciplinary awareness and a broad understanding of these core engineering fields.

Course Objectives

1. To provide an understanding of the fundamental principles of thermodynamics, internal combustion engines, refrigeration and psychrometric systems
2. To provide an understanding of the fundamental principles of fluid machinery, power transmission elements and manufacturing processes.
3. To provide students with a fundamental understanding of Civil Engineering concepts, its major disciplines, structural systems, and the basic principles of building planning and regulations.
4. To familiarise students with engineering construction materials and modern materials used in Civil Engineering, including their properties, classification, tests, and applications in practice.

Course Outcomes (COs)

CO#	CO Statement	Knowledge Level
CO1	Compare the operational characteristics and thermodynamic performance parameters of different types of IC engines and refrigeration cycles.	K2
CO2	Explain the working principles, constructional features, and applications of common fluid machines and mechanical power transmission drives	K2
CO3	Explain the fundamental principles and applications of various manufacturing processes.	K2
CO4	Explain the fundamentals of Civil Engineering, its major disciplines, and the classification of engineering structures.	K2

CO5	Describe the basic principles of residential building planning, structural components, site selection, and relevant building regulations.	K2
CO6	Identify and classify the properties, tests, and describe the applications of natural and manufactured construction materials used in Civil Engineering.	K3

Course Articulation Matrix

CO-PO-PSO Mapping

	PROGRAM OUTCOMES											PSOs		
CO #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**1**	**2**	**3**
CO1	3	2	1	-	-	-	-	-	-	-	-	-	-	-
CO2	3	1	1	-	-	-	-	-	-	-	-	-	-	-
CO3	3	2	1	-	-	-	-	-	-	-	2	-	-	-
CO4	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	1	1	-	-	2	-	-	-	-	-	-	-	-
CO6	3	1	1	-	-	-	-	-	-	-	-	-	-	-
Ave.	**2.83**	**2.33**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation, NA: Not Applicable

Course Syllabus

Module: 1	**Contact Hours: 15**
General introduction to Mechanical Engineering: Thermodynamic cycles -Carnot Cycle -Derivation of efficiency (problems on efficiency) Otto, Diesel cycles (no derivation of efficiency and problems). IC Engines: CI & SI Engines, working of 2-Stroke & 4-Stroke engines. Listing the parts of IC Engines. Concept of CRDI, MPFI and hybrid engines. Refrigeration: Unit of refrigeration, reversed Carnot cycle, COP, vapour compression cycle (only description and no problems); Definitions of dry, wet & dew point temperatures, specific humidity and relative humidity, Psychrometric chart, Cooling and dehumidification, Layout of central air conditioning systems. (15 Hrs.)	

Module: 2	**Contact Hours: 15**
Classification of pumps, Description about working with sketches of: Reciprocating pump, Centrifugal pump. Classification of Hydraulic Turbines. Different type of gears and its applications (spur, helical, bevel,	

worm and worm wheel), List types of clutches and their use, Bearings and their classification (Journal bearing and ball bearing)
Manufacturing Process: Sand Casting, Forging, Rolling, Extrusion. Metal Joining Processes: List types of welding, Description with sketches of Arc Welding, SMAW, Soldering and Brazing and their applications. Machining processes: Description and operations performed on Lathe, Drilling machine, Milling machine, CNC machine, 3D printing. (15 Hrs.)

Module: 3	**Contact Hours: 15**
General Introduction to Civil Engineering: Relevance of Civil Engineering in the overall infrastructural development of the country. Brief introduction to major disciplines of Civil Engineering like Surveying & Planning, Structural Engineering, Geo-technical Engineering, Transportation Engineering, Construction management, Water Resources Engineering and Environmental Engineering. **Types and classification of structures**- Buildings, towers, chimneys, bridges, dams, retaining walls, water tanks, roads, and railways. **Introduction to buildings:** Types of buildings according to character of occupancy as per NBC, load-bearing and non-load bearing building structures, structural components of a residential building with schematic sketch and functions (concept only). Selection of a site for a residential building. Building Area Definitions: Built-up area, Plinth area, Floor area, Carpet area and Floor area ratio of a building, Introduction to building plan & site plan as per KBR. Need for building rules and regulations such as KBR, NBC & CRZ norms.	

Module: 4	**Contact Hours: 15**
Natural materials in construction: Sand – uses; Rock – classification and uses; Timber – seasoning, preservation and uses. Uses of timber alternatives – veneer, plywood, fibre board, particle board, multiwood. **Manmade construction materials:** Brick and cement: Classifications, Qualities, Tests and Uses. Steel: Structural steel sections and steel reinforcements – types and uses. Cement concrete: Constituent materials including admixtures, PCC, RCC, Grades of concrete, Tests on fresh and hardened concrete - slump test, cube compressive strength as per IS Codes. **Application of Modern Materials:** Architectural glass, ceramics, Plastics, composite materials, thermal and acoustic insulating materials, decorative panels, and waterproofing materials. Modern uses of gypsum, pre-fabricated building components (brief discussion only).	

Continuous Internal Evaluation (CIE)

Attendance	Project / Assignment	Internal Exam-1 (MOD 1&3)	Internal Exam-2 (MOD 2&4)	Total
5	15	10	10	40

Suggested Assignments for Course Teacher's Assessment (CTA) Through Self-Learning Component:

1. Prepare a comparative technical report that explores how internal combustion engines have evolved to meet modern efficiency demands.
2. Create a classification chart for hydraulic turbines. Explain the fundamental operational difference between an *Impulse* turbine (like the Pelton wheel) and a *Reaction* turbine (like the Francis/Kaplan turbines)
3. Using neat labeled sketches where appropriate, explain the working principles, key operational differences, and typical industrial applications of primary metal forming, joining, and machining processes
4. The concept and applications of 3D printing in building construction.
5. Disaster-resistant building components and their role in improving structural safety.
6. Application of eco-friendly construction materials.
7. Field visit report: Visit a nearby under-construction or completed residential building; identify and photograph structural components, note building classification, and estimate plinth/built-up area.
8. Concept of green infrastructure.

Text Books

1. Basic Mechanical Engineering- Pravin Kumar, Pearson Education,
2. A Textbook of Basic Mechanical Engineering- R.K. Rajput, Laxmi Publications
3. Elements of Mechanical Engineering, K.P. Roy, S.K. Hajra Choudhury, A.K. Hajra Choudhury, Media Promoters & Publishers Pvt. Ltd.
4. Fundamentals of Mechanical Engineering, G.S. Sawhney, PHI Learning Pvt.Ltd.
5. Dalal, K. R. (2012). *Essentials of Civil Engineering*. 1st ed., Charotar Publishing House.
6. Duggal, S. K. (2019). *Building Materials*. 5th ed., New Age International.

Reference Books and Extended Learning

1. Automotive Engineering Fundamentals, Richard Stone and Jeffrey K. Ball, SAE International.
2. Additive Manufacturing Technologies: 3D Printing, Rapid Prototyping, and Direct Digital Manufacturing Rosen, and Brent Stucker, Springer
3. Construction Technology Vol.I to IV- Chudley, R., Longman group, England
4. Building Materials, Duggal S K, New Age International

Extended Learning

1. https://nptel.ac.in/courses/112104526
2. https://onlinecourses.nptel.ac.in/e-learning/preview/noc22_ce42
3. https://nptel.ac.in/courses/105106201
4. https://nptel.ac.in/courses/105106206

Course Code	26UCEST105		
Course Name	Programming in C		
Teaching Hours	L:45 T:0 P:30 SL:45	**Course Credits**	4
Continuous Internal Assessment Marks	40	**Semester End Exam Marks**	60
Exam Hours	2½ Hours	**Total Marks**	100
Course Type	ESC	**Course Category**	UC
Prerequisites	Nil		

Preamble

The Programming in C course is designed to equip first-year engineering students with a strong foundation in computational thinking, structured problem-solving, and procedural programming fundamentals. This course serves as a foundational programming course common to all engineering disciplines, requiring no prior programming background. It bridges theoretical concepts and hands-on software development using the C programming language. Students will transition from basic algorithmic logic to designing, debugging, and managing modular, memory-efficient applications.

Course Objectives

1. To introduce the fundamentals of problem-solving and C programming.
2. To enable students to analyse computational problems, design algorithms, and develop efficient, modular, and C programs using appropriate programming constructs.
3. To promote students for logical thinking, debugging skills, and good programming practices.

Course Outcomes (COs)

CO#	CO Statement	Knowledge Level
CO1	**Design** and represent efficient solutions for given problem scenarios using algorithms and flowcharts.	K2
CO2	**Explain** the scope, lifetime, and memory layout of variables, operators and control structures across different memory segments in C programs.	K2
CO3	**Apply** the appropriate arrays, strings to develop C programs for given problem scenarios.	K3

CO4	**Apply** modular programming principles using functions, parameter passing mechanisms, and recursion to design structured and reusable software solutions.	K3
CO5	**Utilize** user-defined data types structures and unions and appropriate storage classes to efficiently organize complex data and manage memory allocation.	K3
CO6	**Develop** C programs using pointers, dynamic memory allocation, and file handling techniques to solve computational problems efficiently.	K3

Course Articulation Matrix

CO-PO-PSO Mapping

	PROGRAM OUTCOMES											PSOs		
CO#	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	–	1	–	–	–	–	1	2	–	–	–
CO2	3	2	–	–	1	–	–	–	–	–	2	–	–	–
CO3	3	3	2	–	2	–	–	–	–	–	2	–	–	–
CO4	3	3	3	–	2	–	–	–	–	1	2	–	–	–
CO5	3	2	3	–	2	–	–	–	–	–	2	–	–	–
CO6	3	3	3	–	2	–	–	–	–	1	2	–	–	–
Avg	**3**	**2.5**	**2.6**	**-**	**1.7**	**-**	**-**	**-**	**-**	**1.0**	**2**	–	–	–

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation,

Course Syllabus

Module: 1	**Contact Hours: 11**
Introduction to structured approach to programming, Flow chart, Algorithms, Pseudo code. C Fundamentals - Character set, Tokens, Variables, and Data types, scope of variables, Operators and its precedence, Expressions, Type conversions, Statements - Input and Output statements, Structure and memory layout of a C program.	

Control Statements - if, if-else, nested if, switch, while, do-while, for, break & continue, nested loops.

Module: 2	**Contact Hours: 11**
Arrays - Single-dimensional arrays, Defining an array, Array initialization, accessing array elements, Enumerated data type, Type Definition, Two-dimensional arrays – Defining a two-dimensional array, Programs for matrix processing, Programs for sequential search, Bubble sort. Strings - Declaring a string variable, Reading and displaying strings, String-related library functions – Programs for string matching.	

Module: 3	**Contact Hours: 11**
Functions - Function definition, Function call, Function prototype, Parameter passing, Recursion, Passing an array to a function, Command-line arguments. Structures - Defining a Structure variable, accessing members, Array of structures, Passing structure to function, Union. Storage Class - Storage Classes associated with variables - automatic, static, external and register.	

Module: 4	**Contact Hours: 12**
Pointers - Declaration, Operations on pointers, passing a pointer to a function, accessing array elements using pointers, processing strings using pointers, pointer to pointer, array of pointers, pointer to function, pointer to structure. Practical Implementation & Basics of Dynamic Memory Allocation. Files- Different types of files in C, Opening and Closing a file, writing to and Reading from a file, processing files, Library functions related to file.	

Continuous Internal Evaluation (CIE)

Theory based course with 40:60 marks (Lab course)

Attendance	Continuous Assessment	Internal Exam-1 (MOD 1 and 2)	Internal Exam-2 (MOD 3 and 4)	Internal Exam-3 (Lab)	Total
5	10	10	10	5	40

Suggested Assignments for Course Teacher's Assessment (CTA) Through Self-Learning Component:

1. **Develop a Mini Software Application**
   Design and develop a menu-driven, modular C application for a real-world problem such as Banking Management, Library Management, Student Information Management, Hospital Management, Inventory/Stock Management, or Employee Payroll etc. The application shall incorporate appropriate data structures, user-defined functions, file handling, error checking, and modular programming principles.

2. **Performance Analysis of Function Calls**
   Investigate and compare the implementation, execution efficiency, memory utilization, and practical applications of inline functions, macros, and user-defined functions in C through experimental analysis and performance benchmarking. Prepare a comparative technical report based on the observations.

3. **Robust Error Handling in C Programs**
   Develop a comprehensive C application demonstrating robust error handling techniques using standard library functions, user-defined error codes, file operation errors, command-line argument validation, dynamic memory allocation errors, and common exit status codes.

4. **Data Processing Using File Handling**

   Develop a file-based application that reads large datasets, performs searching, sorting, filtering, and statistical analysis, and generates formatted reports.

Text Books

1. Brian W. Kernighan and Dennis Ritchie, The C Programming Language, Pearson 2/e, 2015.
2. Herbert Schildt, C The Complete Reference, Mc Graw Hill, 4/e, 2017.

Reference Books and Extended Learning

1. Byron S Gottfried, Programming with C, Mc Graw Hill, 4/e, 2018.
2. Jeri R. Hanly, Elliot B. Koffman, Problem Solving and Program Design in C, Pearson, *8*/e, 2016.
3. Stephen G, Kochan Programming in C, Addison-Wesley, 4/e, 2015.
4. Web Resource: http://www.digimat.in/nptel/courses/video/106104128/L01.html
5. Web Resource: www.w3schools.com/c/

Course Code	26GCESL106		
Course Name	BASIC ENGINEERING WORKSHOP		
Teaching Hours	L:0 T:0 P:30 SL:30	Course Credits	2
Continuous Internal assessment Marks	50	Semester End Exam Marks	50
Exam Hours	2½ Hours	Total Marks	100
Course Type	ESC (Laboratory)	Course Category	GC (Group C)
Prerequisites	Nil		

Preamble

Basic Engineering Workshop Practice is a foundational, hands-on experiential laboratory designed to introduce students to the tactile realities of engineering materials, manufacturing processes, and construction techniques. While theoretical courses focus on analysis and design equations, the workshop environment translates these abstract concepts into physical objects and assemblies. Covering fundamental trades across both Mechanical and Civil Engineering, this course builds essential kinesthetic skills, practical problem-solving capabilities and industrial safety awareness.

Course Objectives

1. To enable the student to familiarize various tools, measuring devices, practices and different methods employed in the industry.
2. To enable the students to apply this experience while developing a product/project for the benefit of society.

Course Outcomes (COs)

CO	CO Statement	Knowledge Level
CO1	Identify workshop operations and instruments in accordance with the material and objects.	K2
CO2	Select appropriate tools and instruments with respect to the workshop specializations.	K2
CO3	Apply various tools, measuring devices, practices and different methods employed in the industry.	K3
CO4	Perform linear and area measurements using conventional and electronic surveying instruments, and apply these measurements for basic building layout and setting out operations.	K3

CO5	Evaluate the quality of common construction materials, construct brick masonry using English and Flemish bonds, and estimate building materials required for simple masonry works.	K3
CO6	Identify the basic components of residential buildings, and prepare simple building line sketches based on given requirements.	K3

Course Articulation Matrix

CO-PO-PSO Mapping

	PROGRAM OUTCOMES											PSOs		
CO #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**1**	**2**	**3**
CO1	3	2	1	-	-	-	1	-	2	-	3	-	-	-
CO2	3	2	1	-	-	-	1	-	2	-	3	-	-	-
CO3	3	2	1	-	1	-	1	-	2	-	3	-	-	-
CO4	3	2	1	-	1	-	-	-	1	-	-	-	-	-
CO5	3	3	1	1	-	-	-	-	1	-	-	-	-	-
CO6	3	2	1	-	-	-	1	-	-	1	-	-	-	-
Avg	**3**	**2.17**	**1**	**1**	**1**	**-**	**1**	**-**	**1.6**	**1**	**3**	**-**	**-**	**-**

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation,

Course Syllabus

Expt. No.	**Experiments (Minimum 12 Exercises - 6 each from each category)**	**Contact Hours: 30**
	Category I - Mechanical Engineering	
1	General: Introduction to workshop practice, Safety precautions, Shop floor ethics, and Basic First Aid knowledge. Study of mechanical and measurement tools, components and their applications: (a) Tools: screw drivers, spanners, Allen keys, cutting pliers etc. and accessories (b) bearings, seals, O-rings, circlips, keys etc.(c)Vernier Calipers, Height Gauge, Depth Gauge, Micrometers, Bevel Protractor etc.	
2	Carpentry: Understanding carpentry tools and knowledge of at least one model 1. T –Lap joint 2. Cross lap joint 3. Dovetail joint 4. Mortise joints	
3	Foundry: Understanding of foundry tools and knowledge of at least one model 1. Bench Moulding 2. Floor Moulding 3. Core making 4. Pattern making	

4	Sheet Metal: Understanding sheet metal working tools and knowledge of at least one model 1. Cylindrical shape 2. Conical shape 3. Prismatic shaped job from sheet metal
5	Fitting: Understanding the tools used for fitting and knowledge of at least one model 1. Square Joint 2. V- Joint 3. Male and female fitting
6	Plumbing: - Understanding plumbing tools and pipe joints, along with practicing one exercise on joining pipes using a minimum of three types of pipe joints
7	Smithy: - Understanding the tools used in smithy. Demonstrating the forgeability of different materials (MS, Al, alloy steel and cast steels) in both cold and hot states. Observing the qualitative difference in the hardness of these materials. One exercise on smithy (Square prism).
8	Welding: Understanding welding equipment and practicing at least one welding technique, such as making joints using electric arc welding. Bead formation in horizontal, vertical and overhead positions
9	Metrology: Common measuring instruments used in workshops, experiments to find the angle of a dovetail, angle of a taper and the radius of a circular surface. Introduction to instruments Vernier Bevel Protractor, Vernier Depth Gauge, Vernier Height Gauge.
10	Assembly: Demonstration only Dissembling and assembling of 1. Cylinder and piston assembly 2. Tail stock assembly 3. Bicycle 4. Pump or any other machine
11	Machines: Demonstration of the following machines: Shaping and slotting machine; Milling machine; Grinding Machine; Lathe; Drilling Machine.
12	Modern manufacturing methods (Fab lab/IDEA Lab - Demonstration only): Power tools, CNC machine tools, 3D printing, Soft Materials cutting using special machines
Category II - Civil Engineering	
13	Measurements using Tape, Ruler, Vernier calipers, and screw gauge
14	Measuring the area of a plot with an irregular boundary using a chain and cross staff
15	Measuring the area of a building using Electronic-equipment
16	On-site quality assessment of bricks and cement in masonry
17	Construct a 1 and 1 ½ thick brick wall with a minimum length of 60 cm using English bonds. Check the verticality of the wall (min 3 courses)
18	Construct a 1 and 1 ½ thick brick wall with a minimum length of 60 cm using Flemish bond. Check the verticality of the wall (min 3 courses)

19	Estimate the number of different types of building blocks needed to construct the walls of a room measuring, accounting for standard-sized doors and windows.
20	Setting out of a two-roomed building using thread, tape and water tube levelling.
21	Basics of building components
22	Introduction to Civil Engineering Drawing, Concept of Scale, Plan, Section, and Elevation.
23	Draw sectional details and elevation of panelled doors.
24	Draw sectional details and elevation of the wooden glazed window.
25	Building planning - line sketch familiarisation.
26	Preparation of a line sketch based on requirements (single-storey residential building only)

Continuous Internal Assessment (CIA)

Attendance	Preparation/Pre-Lab Work, experiments, Viva and Timely completion of Lab Reports / Record (Continuous Assessment)	Total
10	40	50

Semester End Examination (SEE):

Procedure/ Preparatory work	Conduct of experiment/ Execution of work	Result with valid inference	Viva voce	Record	Total
10	15	10	10	5	50

- *Submission of Record: Students shall be allowed for the end semester examination only upon submitting the duly certified record.*
- *Minimum Pass Mark: The requirement for passing the lab course included in the first-year curriculum is that the student must score a minimum of 50% overall, combining marks from both Continuous Internal Assessment (CIA) and End Semester Examination (SEE). There is no separate minimum requirement for each component.*
- *There will not be any relaxation in the attendance requirement.*

Text Books

1. Mechanical Workshop Practice, K C John, PHI Learning, Edition 2, 2010
2. Engineering Materials, S C Rangwala, Charotar Publishing House Pvt Limited, Edition 43, 2019

Reference Books and Extended Learning

1. Elements of Workshop Technology Vol-1-ManufacturingProcesses, S K Hajra Choudhury A K Hajra Choudhury Nirjhar Roy, MPP Media Promoters and Publishers, 2008
2. Arora, S. P., & Bindra, S. P. (2022). *Building Construction* (5th ed.). Dhanpat Rai Publications.
3. Khanna, P. N. (2012). *Indian Practical Civil Engineering Handbook*. UBS Publishers' Distributors (P) Ltd.
4. Prabhu B T S et.al. (2022). Building Design and Civil Engineering Drawing. Spades Publishers

Continuous Assessment (40 Marks)

- Preparation and Pre-Lab Work (10 Marks)
    - Pre-Lab Assignments: Assessment of pre-lab assignments or quizzes that test understanding of the upcoming experiment.
    - Understanding of Theory: Evaluation based on students' preparation and understanding of the theoretical background related to the experiments.
- Conduct of Experiments (10 Marks)
    - Procedure and Execution: Adherence to correct procedures, accurate execution of experiments, and following safety protocols.
    - Skill Proficiency: Proficiency in handling equipment, accuracy in observations, and troubleshooting skills during the experiments.
    - Teamwork: Collaboration and participation in group experiments.
- Lab Reports and Record Keeping (10 Marks)
    - Quality of Reports: Clarity, completeness and accuracy of lab reports. Proper documentation of experiments, data analysis and conclusions.
    - Timely Submission: Adhering to deadlines for submitting lab reports/rough record and maintaining a well-organized fair record.
- Viva Voce (10 Marks)
    - Oral Examination: Ability to explain the experiment, results and underlying principles during a viva voce session.

Evaluation Pattern for Semester End Examination (50 Marks)

1. Procedure/Preliminary Work/Design (10 Marks)
    - Procedure Understanding and Description: Clarity in explaining the procedure and understanding each step involved.
    - Preliminary Work and Planning: Thoroughness in planning and organising materials/equipment.
2. Conduct of Experiment/Execution of Work/Programming (15 Marks)
    - Setup and Execution: Proper setup and accurate execution of the experiment.
3. Result with Valid Inference (10 Marks)
    - Accuracy of Results: Precision and correctness of the obtained results.
    - Analysis and Interpretation: Validity of inferences drawn from the experiment.
4. Viva Voce (10 Marks)
    - Ability to explain the experiment, procedure, results and answer related questions
    - Proficiency in answering questions related to theoretical and practical aspects of the subject.
5. Record (5 Marks)
    - Completeness, clarity, and accuracy of the lab record submitted.

Course Code	26UCHUT128		
Course Name	LIFE SKILLS AND PROFESSIONAL COMMUNICATION		
Teaching Hours	L:0 T:0 P:30 SL:0	**Course Credits**	1
Continuous Internal assessment Marks	100	**Semester End Exam Marks**	0
Exam Hours	Nil	**Total Marks**	100
Course Type	HMC: Activity-based learning	**Course Category**	UC: Common Course (For all branches)
Prerequisites	None		

Preamble

This course focuses on developing students' personal, interpersonal, communication, and professional skills. It enhances self-awareness, teamwork, critical thinking, emotional intelligence, and effective communication, while preparing students to confidently meet academic, workplace, and career challenges.

Course Objectives

1. To introduce the concepts of self-awareness, personal growth, and essential life skills.
2. To enable students to develop effective communication and interpersonal skills.
3. To develop students' ability to work effectively in groups and teams.
4. To enhance critical thinking, problem-solving, and decision-making skills.
5. To provide knowledge and strategies for developing emotional intelligence to handle academic, personal, and professional challenges.
6. To establish professional skills and workplace competencies aligned with industry expectations.

Course Outcomes (COs)

CO#	CO Statement	Knowledge Level
CO1	Demonstrate self-awareness, emotional intelligence, and essential life skills to foster personal growth, build positive relationships, and adapt effectively to academic, personal, and professional environments.	K2
CO2	Collaborate effectively in diverse groups and teams by demonstrating interpersonal skills, leadership, responsibility and respect for diversity.	K3
CO3	Apply critical thinking, problem-solving, and decision-making skills to analyze situations and identify appropriate solutions.	K4

CO4	Demonstrate basic workshop skills by performing simple mechanical operations such as measuring, marking, cutting, drilling, and welding while following safe working practices.	K3
CO5	Integrate life skills, communication skills, and professional competencies by applying effective listening, speaking, reading, and writing skills to communicate clearly and confidently and address personal, academic, and workplace challenges effectively.	K4

Course Articulation Matrix

CO-PO-PSO Mapping

	PROGRAM OUTCOMES											PSOs		
CO #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**1**	**2**	**3**
CO1	-	-	-	-	-	-	2	2	2		3	-	-	-
CO2	-	-	-	-	-	-	2	3	2	2	2	-	-	-
CO3	-	2	-	-	-	-	-	-	-	1	2	-	-	-
CO4	2	-	-	-	1	-	2	2	-	-	1	-	-	-
CO5	-	-	-	-	-	-	1	2	3	2	2	-	-	-
Avg	**2**	**2**	**-**	**-**	**1**	**-**	**1.75**	**2.25**	**2.33**	**1.67**	**2**	-	-	-

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation,

Course Syllabus

Module: 1	**Contact Hours:6**
Overview of Life Skills, Life Skills for professionals, Self-Awareness, Communication Skills, Empathy, Self-Reflection report, Identify their own goal, Role Storming, Online personality test, Creativity, Mind Map, Personality Development.	

Module: 2	**Contact Hours: 6**
Effective Communication, Interpersonal relationship, Group Formation, Getting Acquainted in a Group, Group Discussion, Six Thinking Hats, Debate, Team Work, Leadership, Time Management, Cooperation and Commitment, Stress Management, Gratitude Training	

Module: 3	**Contact Hours: 6**
Critical and Creative Thinking, Problem Solving, Decision Making, Prepare a Presentation, Activities to improve English vocabulary, Basic English Grammar, Activities to identify errors in English language usage, TED Talks, Composing Emails and letters, Drafting Reports	

Module: 4	Contact Hours: 12
LinkedIn profile creation, Resume Preparation, Know Yourself, Mock Interview Lab Activities: Hands on session on day to day engineering skills and a self-reflection report on the experienced gained- Drilling, Cutting, Filing, finishing and smoothening using electrically operated hand grinders, MS Rod cutting, Handling different types of measuring instruments, Welding MS,SS work pieces, Pipe Bending, Water Tap fitting, Foot Valve fitting practices	

Continuous Internal Assessment (CIA)

Classroom Activities to learn Communication Skills [CA]	Group Discussion/ Debate [GD]	Presentation Skills [PPT]	Portfolio/Lab Report [PTF/LR]	Total CA+GD+PPT+LR/ PTF
20	30	20	30	100

Suggested Classroom Activities:

1. Group formation, self-introduction, and personality assessment with self-reflection.
2. Role storming, goal setting, and mind mapping for personal and professional development.
3. Group discussions, debates, and presentations on life skills.
4. Activities to develop teamwork, leadership, time management, cooperation, and commitment.
5. Stress management and gratitude training to enhance emotional well-being.
6. Critical thinking, creative thinking, problem-solving, and decision-making activities.
7. English language enhancement through vocabulary, grammar, TED Talk reviews, email/letter writing, and technical report preparation.
8. Career readiness activities including LinkedIn profile creation, resume preparation, self-assessment, and mock interviews.
9. Hands-on engineering skill sessions covering basic workshop practices such as measuring, drilling, cutting, filing, welding, pipe bending, and fitting.
10. Independent learning through online certification courses, self-improvement reading, reflective journaling, educational videos, presentation practice, and current affairs to promote continuous personal, professional, and technical growth.

Text Books

1. Life Skills for Engineers, Compiled, ICT Academy of Kerala, McGraw Hill Education(India)Private Ltd.,2016.
2. Personality Development and Soft Skills, Barun K Mitra, , Oxford Publishers,2011.
3. Life Skills, R Gopalakrishnan, McGraw Hill Education, 2015.

Reference Books and Extended Learning

1. NPTEL video repository: https://nptel.ac.in/courses/109107121
2. NPTEL video repository: https://nptel.ac.in/courses/109104107