

NANDHA ENGINEERING COLLEGE

(An Autonomous Institution affiliated to Anna University Chennai and approved by AICTE, New Delhi)
Erode - 638 052, Tamil Nadu, India, Phone: 04294 - 225585



Curriculum and Syllabi

for

B.E - Mechanical Engineering [R26]

[CHOICE BASED CREDIT SYSTEM]

[This Curriculum and Syllabi are applicable to students admitted from the academic year 2026-2027 onwards]

JULY 2026

INSTITUTE VISION AND MISSION	
VISION	• To be an Institute of excellence providing quality Engineering, Technology and Management education to meet the ever changing needs of the society
MISSION	• To provide quality education to produce ethical and competent professionals with social Responsibility • To excel in the thrust areas of Engineering, Technology and Entrepreneurship by solving real- world problems • To create a learner centric environment and improve continually to meet the changing global needs

B.E – MECHANICAL ENGINEERING	
VISION	• To be recognised as a centre of excellence in the field of Mechanical Engineering and to produce competent engineers with multi-disciplinary exposure to meet the changing needs of society.
MISSION	• To enrich technical knowledge and skills by imparting quality education with ethics and social responsibility. • To empower students in the thrust areas of Mechanical, Allied Engineering, and Entrepreneurship in the continually changing global market. • To provide a conducive learning environment for continual improvement to cater to the needs of society.
PROGRAMME EDUCATIONAL OBJECTIVES (PEO)	The graduates of Mechanical Engineering will be PEO 1: Core Competency: A successful professional with core competency and inter-disciplinary skills to satisfy industrial needs. PEO 2: Research, Innovation and Entrepreneurship: Capable of identifying technological requirements for society and providing innovative solutions to real time problems. PEO 3: Ethics, Human values and Life-long learning: Able to apply professional and ethical practices in their career through continuous learning.
PROGRAMME SPECIFIC OUTCOMES (PSO)	The students of Mechanical Engineering will be able to PSO 1: Identify, formulate, and analyze the problems of Mechanical, Allied Engineering systems and product development. PSO 2: Apply appropriate computer-aided engineering tools for modeling, simulation, analysis, and manufacturing techniques to solve engineering problems.

PROGRAM OUTCOMES:

Engineering Graduates will be able to:

a-l	GRADUATE ATTRIBUTES	PO No.	PROGRAMME OUTCOMES
a	Engineering knowledge	PO1	Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
b	Problem analysis	PO2	Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
c	Design/development of solutions	PO3	Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
d	Conduct investigations of complex problems	PO4	Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8)
e	Engineering tool usage	PO5	Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)
f	The Engineer and The World	PO6	Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7)
g	Ethics	PO7	Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
h	Individual and Collaborative team work	PO8	Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
i	Communication	PO9	Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences
j	Project management and finance	PO10	Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
k	Life-Long Learning	PO11	Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

NANDHA ENGINEERING COLLEGE (AUTONOMOUS), ERODE - 638 052

REGULATIONS - 2026 (R26)

CHOICE BASED CREDIT SYSTEM (CBCS)

B.E. MECHANICAL ENGINEERING

CURRICULUM :

I - VIII SEMESTERS

S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	26MAN01	Induction Program	M						
SEMESTER: I									
1	26GYA01	தமிழர் மரபு / Heritage of Tamils	HUM	T	1	0	0	1	1
2	26MYB01	Linear Algebra and Applied Calculus	BS	T	3	1	0	4	4
3	26CYB01	Applied Chemistry	BS	LIT	2	0	2	3	4
4	26ADC02	Problem Solving and Python Programming	ES (G)	LIT	3	0	2	4	5
5	26MEC01	Engineering Drawing and Graphics	ES (G)	LIT	3	0	2	4	5
6	26EYP01	English Communication Lab	HUM	L	0	0	4	2	4
7	26GEP02	Makerspace	SD	L	0	0	4	2	4
8	26GYP01	Yoga for Youth Empowerment	HUM	L	0	0	2	1	2
TOTAL					12	1	16	21	29

SEMESTER: II									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	26GYA02	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	HUM	T	1	0	0	1	1
2	26CYB04	Climate Change and Sustainability	HUM	T	2	0	0	2	2
3	26MYB02	Fourier Analysis and Partial Differential Equations	BS	T	3	1	0	4	4
4	26PYB04	Physics of Materials	BS	T	3	0	0	3	3

5	26EEC04	Electrical Engineering	ES (G)	T	3	0	0	3	3
6	22MEC03	Engineering Mechanics	ES (G)	T	3	1	0	4	4
7	26EYP02	English Proficiency Lab	HUM	L	0	0	2	1	2
8	26PYP01	Physics Laboratory	BS	L	0	0	2	1	2
9	26GEP01	Foundation Laboratory	SD	L	0	0	4	2	4
10	26GEP03	Life Skills for Engineers	SD	L	1	0	2	1	3
11	26GEA01	Analytical Skills - I	ES (G)	T	2	0	0	1	2
TOTAL					18	2	10	23	30

SEMESTER: III									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	XXXX	Probability, Statistics and Numerical Techniques	BS	T	3	1	0	4	4
2	XXXX	Design Thinking	ES (G)	T	2	0	0	2	2
3	XXXX	Engineering Thermodynamics	ES (G)	T	3	0	0	3	3
4	XXXX	Metallurgy and Materials Science	ES (PC)	T	3	0	0	3	3
5	XXXX	Manufacturing Processes – I	ES (PC)	LIT	3	0	2	4	5
6	XXXX	Fluid Mechanics and Machinery	ES (PC)	LIT	3	0	2	4	5
7	XXXX	Computer Aided Machine Drawing	ES (PC)	L	0	0	4	2	4
8	XXXX	English Competency Lab	HUM	L	0	0	2	1	2
9	XXXX	Disaster Management and Preparedness	M	T	2	0	0	0	2
10	XXXX	Analytical Skills - II	ES (G)	T	2	0	0	1	2
TOTAL					21	1	10	24	32

SEMESTER: IV									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	XXXX	Introduction to AI for Mechanical Engineering	BS	T	2	0	0	2	2
2	XXXX	Analytical Skills - III	ES (G)	T	2	0	0	1	2
3	XXXX	Thermal Engineering	ES (PC)	LIT	3	0	2	4	5
4	XXXX	Strength of materials	ES (PC)	LIT	3	0	2	4	5
5	XXXX	Manufacturing Processes – II	ES (PC)	LIT	3	0	2	4	5
6	XXXX	Theory of Machines	ES (PC)	LIT	3	0	2	4	5
7	XXXX	Workplace English Lab	HUM	L	0	0	2	1	2
8	XXXX	Personality and Character Development	SD	L	0	0	1	0	1
9	XXXX	Microproject	SD	PW	0	0	4	2	4
TOTAL					16	0	15	22	31

SEMESTER: V									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	XXXX	Machine Design	ES (PC)	T	3	0	0	3	3
2	XXXX	Energy Systems and Sustainable Technologies	ES (PC)	T	3	0	0	3	3
3	XXXX	Design for Additive Manufacturing	ES (PC)	T	3	0	0	3	3
4	XXXX	Heat and Mass Transfer	ES (PC)	LIT	3	0	2	4	5
5	XXXX	Metrology and Measurements	ES (PC)	LIT	3	0	2	4	5
6	XXXX	Elective - I	ES (PE)	T	3	0	0	3	3
7	XXXX	Elective - II	ES (PE/OE)	T	3	0	0	3	3

8	XXXX	Indian Knowledge System	M	T	2	0	0	0	2
TOTAL					23	0	4	23	27

FOR HONOURS									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	XXXX	Capstone Design Project – Level I	SD	GDP	0	0	12	6	12
OR									
1	XXXX	Honours Elective – I		T	3	0	0	3	3
2	XXXX	Honours Elective – II		T	3	0	0	3	3
FOR MINORS									
1	XXXX	Minor Elective – I		T	3	0	0	3	3
2	XXXX	Minor Elective – II		T	3	0	0	3	3

SEMESTER: VI									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	XXXX	Innovation, Start-up and Entrepreneurship	HUM	LIT	2	0	2	3	4
2	XXXX	Mechatronics and IoT	ES (PC)	LIT	3	0	2	4	5
3	XXXX	Finite Element Methods in Mechanical Engineering	ES (PC)	LIT	3	0	2	4	5
4	XXXX	Elective - III	ES (PE)	T	3	0	0	3	3
5	XXXX	Elective - IV	ES (PE)	T	3	0	0	3	3
6	XXXX	Elective - V	ES (PE)	T	3	0	0	3	3
7	XXXX	Elective - VI	ES (PE/OE)	T	3	0	0	3	3
8	XXXX	Comprehension	SD	T	2	0	0	2	2

9	XXXX	Mini Project	SD	PW	0	0	4	2	4
TOTAL					22	0	10	27	32

FOR HONOURS									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	XXXX	Capstone Design Project – Level II	SD	GDP	0	0	12	6	12
OR									
1	XXXX	Honours Elective – III		T	3	0	0	3	3
2	XXXX	Honours Elective – IV		T	3	0	0	3	3
FOR MINORS									
1	XXXX	Minor Elective – III		T	3	0	0	3	3
2	XXXX	Minor Elective – IV		T	3	0	0	3	3

SEMESTER: VII									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	XXXX	Process Planning and Cost Estimation	ES (PC)	T	3	0	0	3	3
2	XXXX	Smart Manufacturing Systems	ES (PC)	LIT	3	0	2	4	5
3	XXXX	Elective - VII	ES (PE)	T	3	0	0	3	3
4	XXXX	Elective - VIII	ES (PE)	T	3	0	0	3	3
5	XXXX	Elective - IX	ES (OE)	T	3	0	0	3	3
6	XXXX	Internship/ Industrial Training	SD	L	0	0	4	2	4
7	XXXX	Project Work - I	SD	PW	0	0	8	4	8
8	XXXX	Research Paper Writing ^A	M		-	-	2	-	2
TOTAL					15	0	16	22	31

FOR HONOURS									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	XXXX	Capstone Design Project – Level III	SD	GDP	0	0	12	6	12
OR									
1	XXXX	Honours Elective – V		T	3	0	0	3	3
2	XXXX	Honours Elective – VI		T	3	0	0	3	3
FOR MINORS									
1	XXXX	Minor Elective – V		T	3	0	0	3	3
2	XXXX	Minor Elective – VI		T	3	0	0	3	3

SEMESTER: VIII									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	XXXX	Project Work - II / Internship cum Project Work	SD	PW	0	0	16	8	16
TOTAL					0	0	16	8	16

Humanities and Social Sciences including Management courses (HUM)									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	26GYA01	தமிழர் மரபு / Heritage of Tamils	HUM	T	1	0	0	1	1
2	26EYP01	English Communication Lab	HUM	L	0	0	4	2	4
3	26GYP01	Yoga for Youth Empowerment	HUM	L	0	0	2	1	2
4	26GYA02	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	HUM	T	1	0	0	1	1
5	26CYB04	Climate Change and Sustainability	HUM	T	2	0	0	2	2
6	26EYP02	English Proficiency Lab	HUM	L	0	0	2	1	2
7	XXXX	English Competency Lab	HUM	L	0	0	2	1	2
8	XXXX	Workplace English Lab	HUM	L	0	0	2	1	2
9	XXXX	Innovation, Start-up and Entrepreneurship	HUM	LIT	2	0	2	3	4

Basic Science Courses (BS)									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	26MYB01	Linear Algebra and Applied Calculus	BS	T	3	1	0	4	4
2	26CYB01	Applied Chemistry	BS	LIT	2	0	2	3	4
3	26MYB02	Fourier Analysis and Partial Differential Equations	BS	T	3	1	0	4	4
4	26PYB04	Physics of Materials	BS	T	3	0	0	3	3
5	26PYP01	Physics Laboratory	BS	L	0	0	2	1	2

6	XXXX	Probability, Statistics and Numerical Techniques	BS	T	3	1	0	4	4
7	XXXX	Introduction to AI for Mechanical Engineering	BS	T	2	0	0	2	2

Engineering Science General Courses – ES (G)

S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	26ADC02	Problem Solving and Python Programming	ES (G)	LIT	3	0	2	4	5
2	26MEC01	Engineering Drawing and Graphics	ES (G)	LIT	3	0	2	4	5
3	26EEC04	Electrical Engineering	ES (G)	T	3	0	0	3	3
4	22MEC03	Engineering Mechanics	ES (G)	T	3	1	0	4	4
5	26GEA01	Analytical Skills - I	ES (G)	T	2	0	0	1	2
6	XXXX	Design Thinking	ES (G)	T	2	0	0	2	2
7	XXXX	Engineering Thermodynamics	ES (G)	T	3	0	0	3	3
8	XXXX	Analytical Skills - II	ES (G)	T	2	0	0	1	2
9	XXXX	Analytical Skills - III	ES (G)	T	2	0	0	1	2

Engineering Science Programme Core – ES (PC)

S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	XXXX	Metallurgy and Materials Science	ES (PC)	T	3	0	0	3	3
2	XXXX	Manufacturing Processes – I	ES (PC)	LIT	3	0	2	4	5

3	XXXX	Fluid Mechanics and Machinery	ES (PC)	LIT	3	0	2	4	5
4	XXXX	Computer Aided Machine Drawing	ES (PC)	L	0	0	4	2	4
5	XXXX	Thermal Engineering	ES (PC)	LIT	3	0	2	4	5
6	XXXX	Strength of materials	ES (PC)	LIT	3	0	2	4	5
7	XXXX	Manufacturing Processes – II	ES (PC)	LIT	3	0	2	4	5
8	XXXX	Theory of Machines	ES (PC)	LIT	3	0	2	4	5
9	XXXX	Machine Design	ES (PC)	T	3	0	0	3	3
10	XXXX	Energy Systems and Sustainable Technologies	ES (PC)	T	3	0	0	3	3
11	XXXX	Design for Additive Manufacturing	ES (PC)	T	3	0	0	3	3
12	XXXX	Heat and Mass Transfer	ES (PC)	LIT	3	0	2	4	5
13	XXXX	Metrology and Measurements	ES (PC)	LIT	3	0	2	4	5
14	XXXX	Mechatronics and IoT	ES (PC)	LIT	3	0	2	4	5
15	XXXX	Finite Element Methods in Mechanical Engineering	ES (PC)	LIT	3	0	2	4	5
16	XXXX	Process Planning and Cost Estimation	ES (PC)	T	3	0	0	3	3
17	XXXX	Smart Manufacturing Systems	ES (PC)	LIT	3	0	2	4	5

Engineering Science Programme Elective – ES (PE)									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1									
2									

3									
4									

Engineering Science Open Elective – ES (OE)

S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1									
2									
3									
4									

Skill Development Courses - SD

S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	26GEP02	Makerspace	SD	L	0	0	4	2	4
2	26GEP01	Foundation Laboratory	SD	L	0	0	4	2	4
3	26GEP03	Life Skills for Engineers	SD	L	1	0	2	1	3
4	XXXX	Personality and Character Development	SD	L	0	0	1	0	1
5	XXXX	Microproject	SD	PW	0	0	4	2	4
6	XXXX	Comprehension	SD	T	2	0	0	2	2
7	XXXX	Mini Project	SD	PW	0	0	4	2	4
8	XXXX	Internship/ Industrial Training	SD	L	0	0	4	2	4
9	XXXX	Project Work - I	SD	PW	0	0	8	4	8
10	XXXX	Project Work - II / Internship cum Project Work	SD	PW	0	0	16	8	16

Mandatory Courses - M									
S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	26MAN01	Induction Program	M						
2	XXXX	Disaster Management and Preparedness	M	T	2	0	0	0	2
3	XXXX	Indian Knowledge System	M	T	2	0	0	0	2
4	XXXX	Research Paper Writing ^A	M		1	1	2	-	2

SEMESTER WISE CREDIT DISTRIBUTION

SEMESTER	HUM	BS	ES (G)	ES (PC)	ES (PE)	ES (PE/OE)	ES(OE)	SD
I	4	7	8					2
II	4	8	8					3
III	1	4	6	13				
IV	1	2	1	16				2
V				17	3	3		
VI	3			8	9	3		4
VII				7	6		3	6
VIII								8
Total	13	21	23	61	18	6	3	25

Credits Total: 170

INDUCTION PROGRAMME							
(Common to All Branches)							
Course Code:	26MAN01				CIA	-	
Course Type: (Theory/Practical/Integrated)					ESE	-	
L:T:P:C	0	0	0	0	Total Marks	Nil	
Total Hours of Pedagogy	2 Weeks				Exam Hours	-	
Prerequisite	Nil						
Course Objectives							
1. To recognize the importance of holistic development, professional ethics, human values, and social responsibility in engineering education. 2. To develop positive interpersonal relationships, adapt effectively to the academic environment and participate responsibly in institutional and societal activities.							
Course Outcomes					Cognitive Level	Weightage of COs in ESE	
The students will be able to							
CO 1	Explain the objectives of the Induction Programme and the role of engineering in addressing societal and national needs.				U	-	
CO 2	Demonstrate self-discipline, healthy lifestyle practices, and awareness of universal human values in day-to-day activities.				Ap		
CO 3	Participate effectively in creative, literary, physical, and department-specific activities to enhance personal and professional skills.				Ap		
CO 4	Analyze the significance of teamwork, communication, and ethical behavior in building positive relationships within the institution and society.				An		
CO 5	Develop innovative ideas and create simple solutions or models through department-specific activities, fostering creativity and a maker mindset.				C		

Mapping of COs with POs / PSOs													
COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1						3	2				3		
CO 2						2	3	2	3	2	3		
CO 3							2	3	3	2	3		
CO 4						2	3	3	3	2	3		
CO 5						1		2	3	2	3		
CO (W.A)						2	3	3	3	2	3		

(i) Physical Activity

This would involve a daily routine of physical activity with games and sports, yoga, gardening, etc.

(ii) Creative Arts

Every student would choose one skill related to the arts, whether visual arts or performing arts. Examples are painting, sculpture, pottery, music, dance, etc. The student would pursue it every day for the duration of the programme. These would allow for creative expression. It would develop a sense of aesthetics and also enhance creativity which would, hopefully, grow into engineering design later.

(iii) Universal Human Values

This is the anchoring activity of the Induction Programme. It gets the student to explore oneself and allows one to experience the joy of learning, stand up to peer pressure, take decisions with courage, be aware of relationships with colleagues and supporting stay in the hostel and department, be sensitive to others, etc. A module in Universal Human Values provides the base. Methodology of teaching this content is extremely important. It must not be through do's and don'ts, but get students to explore and think by engaging them in a dialogue. It is best taught through group discussions and real life activities rather than lecturing.

Discussions would be conducted in small groups of about 20 students with a faculty mentor each. It would be effective that the faculty mentor assigned is also the faculty advisor for the student for the full duration of the UG programme.

(iv) Literary Activity

Literary activity would encompass reading, writing and possibly, debating, enacting a play, etc.

(v) Proficiency Modules

This would address some lacunas that students might have, for example, English, computer familiarity, etc.

(vi) Lectures by Eminent People

Motivational lectures by eminent people from all walks of life should be arranged to give the students exposure to people who are socially active or in public life.

(vii) Visits to Local Area

A couple of visits to the landmarks of the city, or a hospital or orphanage could be organized. This would familiarize them with the area as well as expose them to the under privileged.

(viii) Familiarization to Dept./Branch & Innovations

They should be told about what getting into a branch or department means what role it plays in society, through its technology. They should also be shown the laboratories, workshops & other facilities.

(ix) Department Specific Activities

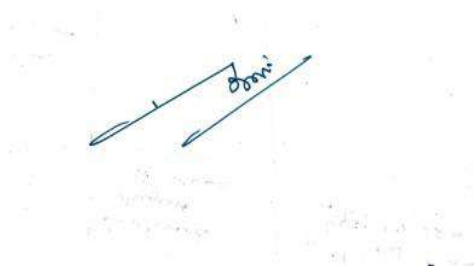
About a week can be spent in introducing activities (games, quizzes, social interactions, small experiments, design thinking, etc.) that are relevant to the particular branch of Engineering/Technology/Architecture that can serve as a motivation and kindle interest in building things (become a maker) in that particular field. This can be conducted in the form of a workshop. For example, CSE and IT students may be introduced to activities that kindle computational thinking, and get them to build simple games. ECE students may be introduced to building simple circuits as an extension of their knowledge in Science, and so on. Students may be asked to build stuff using their knowledge of science.

Induction Programme is totally an activity based programme and therefore there shall be no tests / assessments during this programme.

Total (2 weeks)

References

Guide to Induction program from AICTE



தமிழர்மரபு - HERITAGE OF TAMILS

(Common to all Branches)

Course Code:	26GYA01				CIA	40
Course Type: (Theory/Practical/Integrated)	Theory				ESE	60
L:T:P:C	1	0	0	1	Total Marks	100
Total Hours of Pedagogy	15				Exam Hours	3
Prerequisite	Nil					

பாடத்திட்டத்தின்நோக்கம் :

பழந்தமிழரிடமிருந்தஅறம், இசை, கலைநுட்பம், வாணிபம், கட்டுமானம், மருத்துவம், வீரம், வாழ்வுமுறைஇவற்றைமாணவர்களுக்குஉணர்த்துவது.

Course Outcomes		Cognitive Level	Weightage of COs in ESE
CO1	தமிழ்மொழியின்தொன்மை, பகுத்துண்டுவாழ்தல், மேலாளருக்கானதகுதிகள்,மாணவர்களின்தனித்திறனைவளர்த்தல்.	R	20%
CO2	பண்பாட்டுவிழுமியங்கள், மனிதவளம், நம்பிக்கைகள்ஆகியவற்றைஅறிதல்.	U	20%
CO3	குழுமனப்பான்மை, கலைநுட்பங்கள், இசைவடிவங்களைஅறிதல்.	U	20%
CO4	வாணிபத்தொடர்பு, ஒழுக்ககோட்பாடுகள், சமூகத்தொடர்புஇவற்றைஅறிதல்.	R	20%
CO5	பழந்தமிழரின்வீரம், மருத்துவமுறைகள், தமிழ்பிராமியஎழுத்துவடிவங்கள்ஆகியவற்றைஅறிதல்.	An	20%

அலகு1 – மொழி மற்றும் இலக்கியம்	3
திராவிடமொழிகள் – தமிழ்ஒருசெம்மொழி – சங்கஇலக்கியத்தின்சமயச்சார்பற்றதன்மை – சங்கஇலக்கியத்தில்பகிர்தல்அறம்-திருக்குறளில்மேலாண்மைகருத்துக்கள் – இக்காலஇலக்கியங்கள்	
அலகு 2 –பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை	3
நடுகல் முதல் நவீன சிற்பங்கள் வரை-பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள் – தேர்-குமரி முனையில் திருவள்ளுவர் சிலை – இசைக்கருவிகள்-தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு	
அலகு 3 –நாட்டுப்புறக் கலைகள் மற்றும் வீரவிளையாட்டுகள்.	3
தெருக்கூத்து – கரகாட்டம் – வில்லுப்பாட்டு – ஓயிலாட்டம்-தோல்பாவைகூத்து - சிலம்பாட்டம் – வளரி-தமிழர்களின்விளையாட்டுகள்	
அலகு 4 –தமிழர்களின் திணைக் கோட்பாடுகள்	3
தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள்-சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும் கல்வியும்-சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி-கடல்கடந்த நாடுகளில் சோழர்களின் வெற்றி	
அலகு 5 –இந்தியதேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு.	3
இந்திய விடுதலைப் போரில் தமிழர்களின் பங்கு – சுயமரியாதை இயக்கம் – இந்தியமருத்துவத்தில் சித்தமருத்துவத்தின் பங்கு – கல்வெட்டுக்கள் – ஓலைச்சுவடிகள்	

Suggested Learning Resources**Text Books – CUM- Reference Books**

1. கே.கே.பிள்ளை-தமிழக வரலாறு-மக்களும் பண்பாடும்-வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்.
2. முனைவர் இல.சுந்தரம் - கணினித்தமிழ்-விகடன்பிரசுரம்
3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்- தொல்லியல் துறை வெளியீடு
4. பொருநை-ஆற்றங்கரை நாகரிகம்-தொல்லியல் துறை வெளியீடு
5. Dr.K.K.Pillay - Social life of Tamils, A join publication of TNTB & ESC and RMRL - (in print)
6. Dr.K.K.Pillay - Studies in the History of India with special reference to Tamil Nadu.(Published by: The Author)
7. Keeladi – ‘Sangam City Civilization on the Banks of River Vaigai’ (Jointly published by : Department of Archaeology & Tamil Nadu Text Book and Educational Service Corporation, Tamilnadu)
8. Dr. S. V. Subrahmanian, Dr.K.D. Thirunavvukarasu - Historical Heritage of Tamils - Published by : International Institute of Tamil Studies



(Common to All Branches)							
Course Code:		26MYB01				CIA	40
Course Type: (Theory/Practical/Integrated)		Theory				ESE	60
L:T:P:C		3	1	0	4	Total Marks	100
Total Hours of Pedagogy		60				Exam Hours	3
Prerequisite		Nil					
Course Objectives							
1. To provide fundamental knowledge of Linear Algebra, Calculus, and Differential Equations to develop problem-solving skills for engineering and scientific applications. 2. To develop analytical skills in multivariable functions, optimization, vector calculus, and multiple Integrals for solving engineering problems involving area and volume.							
Course Outcomes						Cognitive Level	Weightage of COs in ESE
The students will be able to							
CO 1	Apply the concepts of eigen values, eigen vectors, and the Cayley–Hamilton theorem to solve matrix-related problems.					Ap	20%
CO 2	Analyze single and multivariable functions using limits, continuity, derivatives, and optimization techniques.					An	20%
CO 3	Evaluate double and triple integrals to determine area and volume.					Ap	20%
CO 4	Compute higher order linear differential equations using analytical methods.					Ap	20%
CO 5	Apply vector calculus concepts and integral theorems in engineering and physical applications.					Ap	20%

Mapping of COs with POs / PSOs													
COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	3				2						2		
CO 2		3			2						2		
CO 3	3				2						2		
CO 4	3				2						2		
CO 5	3				2						2		
CO (W.A)	3	3			2						2		

Unit- I : Linear Algebra	(9+3)
Eigen values and Eigen vectors of a real matrix- Properties of Eigen values and Eigen vectors (without proof)- Cayley Hamilton Theorem (excluding proof) and its applications.	
Unit- II : Calculus of Single and Several Variables	(9+3)
Limit of a function, Continuity, Limits at infinity, Maxima and Minima of functions of single variable, Mean value theorem - Partial derivatives-Total Derivative-Euler's theorem on homogeneous function- Maxima and Minima of functions of two variables.	
Unit- III : Multiple Integration in Cartesian Coordinates	(9+3)
Double integration in Cartesian Co-ordinates-Change of order of integration-Area as double integral-Triple Integration in Cartesian Co-ordinates-Volume as triple integrals.	
Unit- IV : Linear Differential Equations of Second Order	(9+3)
Higher order linear differential equations with constant coefficients - Method of variation of parameters - Cauchy's and Legendre's linear equations.	
Unit- V : Vector Differentiation and Integration	(9+3)
Divergence and Curl – Irrotational and solenoidal vector fields – Line integral over a plane curve – Surface integral and volume integral - Green's, Gauss divergence Theorem (Excluding Proofs) and Stokes Theorem(Excluding Proofs).	
Total (L:45+T:15)	

Suggested Learning Resources
Text Books : 1. Erwin Kreyszig, Advanced Engineering Mathematics, 11th Edition, Wiley India, 2025. 2. B.S. Grewal, Higher Engineering Mathematics, 45th Edition, Khanna Publishers, 2023.
Reference Books: 1. H.K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, 3 rd Revised Edition, S. Chand Publishing, 2023. 2. T.K.V. Iyengar, B. Krishna Gandhi, S. Ranganatham and M.V.S.S.N. Prasad, Engineering Mathematics, Volume I & II, S. Chand Publishing, 2022. 3. N.P. Bali and Manish Goyal, A Textbook of Engineering Mathematics, Laxmi Publications, 2019. 4. B. V. Ramana, Higher Engineering Mathematics, 11th Edition, McGraw Hill Education, 2017. 5. Gilbert Strang, Linear Algebra and Its Applications, 4th Edition (Indian Reprint), Cengage Learning, 2022.



APPLIED CHEMISTRY							
(Common to ECE, EEE, CIVIL, CHEMICAL and MECH)							
Course Code:		26CYB01				CIA	50
Course Type: (Theory/Practical/Integrated)		Integrated				ESE	50
L:T:P:C		2	0	2	3	Total Marks	100
Total Hours of Pedagogy		60 (L : 30 + P : 30)				Exam Hours	3
Prerequisite		NIL					
Course Objectives							
1. To enable students to apply core concepts in water treatment, electrochemistry, energy storage devices, and corrosion science to solve real-world engineering problems. 2. To equip students with knowledge of analytical techniques, nanomaterials, and polymer processing to develop and evaluate solutions in materials science, chemical analysis, and energy systems.							
Course Outcomes						Cognitive Level	Weightage of COs in ESE
The students will be able to							
CO 1	Apply water treatment methods for domestic and industrial applications.					Ap	20%
CO 2	Assess electrochemical systems and polymer processing techniques for industrial applications.					E	20%
CO 3	Evaluate energy storage systems and fuel technologies for energy applications.					E	20%
CO 4	Analyze corrosion mechanisms and protective coating methods for material protection.					An	20%
CO 5	Examine analytical methods and nanomaterials for advanced material applications.					An	20%

Mapping of Cos with POs / PSOs													
COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	2										3		
CO 2			2			2							
CO 3		2				2							
CO 4	2										3		
CO 5	2					2							
CO (W.A)	2	2	2			2					3		

UNIT- I : WATER TREATMENT	6
Hardness - temporary hardness - permanent hardness - Municipal water treatment - disinfection methods - UV - ozonation - chlorination - desalination of brackish water - reverse osmosis - boiler troubles - scale - sludge - caustic embrittlement - treatment of boiler feed water - internal treatment - carbonate - phosphate - calgon conditioning - external treatment - demineralization process - importance and applications of Al in water treatment.	
UNIT- II : ELECTROCHEMISTRY AND POLYMER SCIENCE	6
Electrode potential - Nernst equation - derivation and problems - reference electrodes - calomel electrode - glass electrode. Polymers - classification - addition - condensation - copolymerization - engineering plastics - preparation - properties - uses of PVC and nylon - polymer processing - compression - injection moulding techniques.	
UNIT- III : ENERGY STORAGE SYSTEMS AND FUEL SCIENCE	6
Batteries - types of batteries - secondary batteries - lead acid storage battery - lithium ion battery - flow battery - hydrogen - oxygen fuel cell- electric vehicles - working principles. Fuels - metallurgical coke - manufacture by Otto-Hoffmann method - manufacture of synthetic petrol - Bergius process.	
UNIT- IV : PROTECTIVE COATINGS IN CORROSION SCIENCE	6
Corrosion - types - chemical corrosion - mechanism - electrochemical corrosion - mechanism - factors influencing corrosion - corrosion control - sacrificial anodic protection method - protective coatings - paints - constituents and functions - metallic coatings - electroplating.	
UNIT- V :ANALYTICAL METHODS AND NANO CHEMISTRY	6
Colorimetry – principles- estimation of Iron by colorimetry - UV-Visible spectroscopy- principles - instrumentation (block diagram only) - IR spectroscopy - principles - instrumentation (block diagram only) - Atomic absorption spectroscopy - principles - instrumentation (block diagram only). Nanomaterials - carbon nanotubes - synthesis - laser ablation - chemical vapour deposition method - applications of CNTs.	

List of Experiments:	30 Hours
1. Determination of total, temporary and permanent hardness of water by EDTA method. 2. Estimation of alkalinity in water sample. 3. Determination of chloride content of water sample by Argentometric method. 4. Determination of DO content of water sample by Winkler's method. 5. Estimation of copper in brass by EDTA. 6. Conductometric titration using barium chloride and sodium sulphate. 7. Estimation of iron content of the given solution using potentiometer. 8. Determination of strength of given hydrochloric acid using pH meter.	
Total (L : 30 + P : 30)	

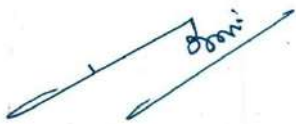
Suggested Learning Resources

Text Books :

1. Dr. Ravikrishnan A., "Applied Chemistry - II", First Edition, Sri Krishna Hitech Publishing Company Pvt. Ltd., Chennai, 2025.
2. S.S. Dara, "A text book of Engineering Chemistry", S.Chand & Co. Ltd. New Delhi, 2024.

Reference Books:

1. Jain P C. and Monica Jain, "Engineering Chemistry", Volume I and II, 17th Edition, Dhanpat Rai Publishing Company, New Delhi 2025.
2. Jaya Shree Anireddy, "Text book of Engineering Chemistry", John Wiley & Sons (India) Private Limited, New Delhi, 2023.
3. B. Sivasankar, Engineering Chemistry, 3rd Edition, McGraw Hill Education (India) Pvt. Ltd., New Delhi, 2023.
4. William D. Callister Jr. and David G. Rethwisch, Callister's Materials Science and Engineering, 11th Edition, John Wiley & Sons, Hoboken, NJ, 2024.
5. M. N. Boraste, Nanomaterials: Principles and Applications, CRC Press, Taylor & Francis Group, Boca Raton, Florida, 2022.



PROBLEM SOLVING AND PYTHON PROGRAMMING							
(Common to Agri, Civil, Chem, Mech Branches)							
Course Code:		26ADC02				CIE	50
Course Type: (Theory/Practical/Integrated)		Integrated				ESE	50
L:T:P:C		3	0	2	4	Total Marks	100
Total Hours of Pedagogy		75 (L : 45 + P : 30)				Exam Hours	3 Hours
Pre-requisites		Nil					
Course Objectives							
To provide students with fundamental Python programming skills for developing computational thinking and problem-solving abilities, and to apply Python libraries for engineering applications.							
Course Outcomes						Cognitive	Weightage of
The students will be able to						Level	COs in ESE
CO 1	Develop algorithmic solutions for basic computational problems using Python fundamentals.					AP	20%
CO 2	Apply Python syntax, data types, and control flow constructs to develop programs for solving basic computational tasks.					AP	20%
CO 3	Apply compound data structures such as strings, lists, tuples, sets, and dictionaries to organize and process sequential data efficiently.					AP	20%
CO 4	Implement file handling operations to manage data input and output in programs.					AP	20%
CO 5	Design and analyze data-driven solutions using NumPy, Pandas, and Matplotlib to clean, filter, and visually explore datasets.					An	20%

Mapping of COs with POs / PSOs													
COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	3	3	3	2							3		
CO 2	3	3	3	2							3		
CO 3	3	3	3	2							3		
CO 4	3	3	3	2							3		
CO 5	3	3	3	2	3						3		
CO (W.A)	3	3	3	2	3						3		

UNIT- I : ALGORITHMIC PROBLEM SOLVING AND PYTHON FUNDAMENTALS	9
Problem Solving, Problem Analysis Chart, Developing an Algorithm, Flowchart and Pseudocode, Interactive and Script Mode, Indentation, Comments, Error messages, Variables, Reserved Words, Data Types, Arithmetic operators and expressions, Built-in Functions, Importing from Packages.	
UNIT- II : Control Structures and functions	9
if, if-else, nested if, multi-way if-elif statements, while loop, for loop, break, continue, nested loops, pass statements. Functions-Introduction to Functions-Defining and Calling Functions-Function Arguments and Return Values-Scope of Variables-Recursive Functions	
UNIT- III : Strings & Collections	9
String Comparison, Formatting, Slicing, Splitting, Stripping, Lists, tuples, and dictionaries, basic list operators, searching and sorting lists; dictionary literals, adding and removing keys, accessing and replacing values.	
UNIT- IV : File Operations	9
Create, Open, Read, Write, Append and Close files. Manipulating directories, OS and Sys modules, reading/writing text and numbers, from/to a file; creating and reading a formatted file (csv, tab-separated, etc.) - File Pointer Methods (seek() and tell())	
UNIT- V : MODULES, PACKAGES	9
Introduction to Modules-Importing Modules using import and from...import-Standard Library Modules-math-random-date time-Creating and Using User-Defined Modules-Introduction to Packages-Accessing Modules from Packages-NumPy: Creating Arrays and Basic Array Operations-Matplotlib: Data Visualization-Line Plots-Bar Charts-Scatter Plots	
List of Experiments:	30 Hours
1. Programs using operators and input/output statements. 2. Programs using conditional and looping constructs (if, for, while) 3. Programs using user-defined and recursive functions 4. Programs using string operations and formatting 5. Programs using lists, tuples, and dictionaries 6. Programs involving file handling operations (reading, writing, appending, seek(), tell()) 7. Programs using standard library modules, user-defined modules, and packages 8. Program to create and perform basic operations on NumPy arrays 9. Programs to visualize data using Matplotlib (Line, Bar, and Scatter plots)	
Total (L : 45 + P : 30)	

Suggested Learning Resources

Text Books:

1. Reema Thareja Python Programming: Using Problem Solving Approach, 3rd Edition, Oxford University Press (2025)
2. R. Nageswara Rao, Core Python Programming, 3rd Edition, Dream tech Press, New Delhi, 2021

Reference Books:

1. Y. Daniel Liang, Introduction to Programming Using Python, 1st Edition, Pearson Education, 2012.
2. Charles Dierbach, Introduction to Computer Science Using Python: A Computational Problem-Solving Focus, 1st Edition, Wiley India, 2013.
3. John V. Guttag, Introduction to Computation and Programming Using Python: With Application to Computational Modeling, 3rd Edition, MIT Press, 2021.
4. Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
5. Eric Matthes, Python Crash Course: A Hands-On, Project-Based Introduction to Programming, 3rd Edition, No Starch Press, 2023.



ENGINEERING DRAWING AND GRAPHICS

(Common to Agri, Chemical, Civil, EEE and Mechanical Engineering)

Course Code:	26MEC01	CIE	50
Course Type: (Theory/Practical/Integrated)	Integrated	ESE	50
L:T:P:C	3 0 2 4	Total Marks	100
Total Hours of Pedagogy	75 (L : 45 + P : 30)	Exam Hours	3 Hrs
Pre-requisites	Nil		

Course Objectives

To impart knowledge of BIS standards and develop skills in engineering drawing, projections, sectioning of solids, and CAD-based orthographic and isometric drawings.

Course Outcomes		Cognitive Level	Weightage of COs in ESE
The students will be able to			
CO 1	Apply engineering drawing standards to construct 2D plane curves and conic sections.	Ap	20 %
CO 2	Apply the principles of first angle projection to solve and draw projection problems involving lines and planes.	Ap	20 %
CO 3	Construct projections of simple solids inclined to principal planes using the rotating object method.	Ap	20 %
CO 4	Develop sectional views and lateral surfaces of solids for manufacturing applications.	Ap	20 %
CO 5	Generate orthographic/isometric drawings and dimensioning as per BIS/ISO standards.	An	20 %

Mapping of COs with POs / PSOs

COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	3							2					2
CO 2	3							2					2
CO 3	3		3					2					2
CO 4	3	3	2					2					2
CO 5	3	2	3		3			2			3		2
CO (W.A)	3	2.5	2.67		3			2			3		2

CONCEPTS AND CONVENTIONS (Not for Examination)	
Importance of graphics in engineering applications - use of drafting instruments - BIS conventions and specifications - size, layout and folding of drawing sheets – types of lines, lettering and dimensioning – scales – title block.	
UNIT- I : PLANE CURVES	9
Basic geometrical constructions of conics - Ellipse, parabola and hyperbola by eccentricity method - construction of cycloid - drawing of tangents and normal to the above curves.	
UNIT-II : PROJECTION OF POINTS, LINES AND PLANES	9
Introduction to theory of projection – first angle and third angle projection. Principal planes - first angle projection - projection of points - projection of straight lines inclined to both the principal planes - determination of true lengths and true inclinations by rotating line method - projection of planes (polygonal and circular surfaces).	
UNIT-III : PROJECTION OF SOLIDS	9
Projection of simple solids - prism, pyramid, cylinder and cone when the axis is inclined to anyone of the principal plane and parallel to the other plane by rotating object method.	
UNIT - IV : SECTION OF SOLIDS AND DEVELOPMENT OF SURFACE	9
Sectioning of solids (prism, pyramid, cylinder and cone) in simple vertical position when the cutting plane is inclined to the one of the principal plane and perpendicular to the other plane - development of lateral surfaces of sectioned solids - prism, pyramid, cylinder and cone.	
UNIT V : ISOMETRIC AND ORTHOGRAPHIC PROJECTIONS	9
Principles of isometric projection - isometric scale - isometric projections of lines, plane figures, simple solids and truncated solids - prism, pyramid, cylinder, and cone – free hand sketching of orthographic views from isometric views of objects.	

List of Experiments:	30 Hours
1. Construction of cycloid. 2. Projection of Lines inclined to both the reference planes. 3. Projection of Planes inclined to both the reference planes. 4. Projection of solids with axis inclined to one reference plane and parallel to the other plane. 5. Development of lateral surface of the sectioned solids. 6. Projection of orthographic views of the given isometric view of the objects.	
Total : L : 45 + P : 30 = 75	

Suggested Learning Resources

Text Books:

1. K. Venugopal and V. Prabhu Raja, "Engineering Graphics", New Age International (P) Limited, 2022.
2. K.V. Natarajan, "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.

Reference Books:

1. N.D. Bhatt and V.M. Panchal, "Engineering Drawing", Charotar Publishing House, 53rd Edition, 2014.
2. K.R. Gopalakrishna., "Computer Aided Engineering Drawing" (Vol I and II combined) Subhas Stores, Bangalore, 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.
4. M.B. Shah and B.C. Rana, "Engineering Drawing", Pearson, 2nd Edition, 2009.



ENGLISH COMMUNICATION LAB							
(Common to all branches)							
Course Code:	26EYP01				CIA	60	
Course Type: (Theory/Practical/Integrated)	Practical				ESE	40	
L:T:P:C	0	0	4	2	Total Marks	100	
Total Hours of Pedagogy	60				Exam Hours	3	
Prerequisite	Nil						
Course Objectives							
1. Apply listening, speaking, reading, and writing skills in professional communication contexts.							
2. Express ideas effectively in real-world professional scenarios using integrated LSRW skills.							
Course Outcomes					Cognitive	Weightage of	
The students will be able to					Level	COs in ESE	
CO 1	Employ effective Communication in academic and professional environments.				Ap	20%	
CO 2	Demonstrate improved listening, speaking, reading, and writing competencies.				Ap	20%	
CO 3	Participate confidently in interpersonal, workplace, and group interactions.				Ap	20%	
CO 4	Apply digital and AI-assisted tools for professional communication tasks.				Ap	20%	
CO 5	Develop ideas clearly and perform effectively in real-world communication scenarios.				C	20%	

Mapping of Cos with POs / PSOs													
COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1								2	3	-	2		
CO 2								2	3	-	2		
CO 3								2	3	-	2		
CO 4								2	3	-	2		
CO 5								2	3	-	2		
CO (W.A)								2	3	-	2		

MODULE - I :COMMUNICATION FOUNDATIONS	12
Grammar –Adjectives - Listening -Audio-Based Diagram Interpretation and Labelling – Speaking - Structured Self-Introduction– Reading -Reading and Interpreting Motivational and Inspirational Passages – Writing -Drafting Formal Permission Letters (Industrial Visit / In-Plant Training Requests)	
MODULE - II :PROFESSIONAL CORRESPONDENCE	12
Grammar –Verbs- Listening - Listening to Iconic Speeches and Transcript Preparation – Speaking -Flash Speak (JAM – Just A Minute) – Reading -Critical Reading of Newspaper Editorials – Writing -Professional E-mail Writing	
MODULE - III :COMMUNICATION IN PRACTICE	12
Grammar –Tenses- Listening -Audio-Visual News Analysis and Reporting English Marathon – 30 Day Speaking Challenge – Speaking - Engineering Problem Identification and Solution Presentation– Reading – Inferential and Analytical Reading Practice– Writing -Writing Instructions and Procedural Guideline	
MODULE - IV :INTERPERSONAL COMMUNICATION	12
Grammar –WH and Yes/No Questions - Listening - Listening for Specific Information – Gap Filling Activities – Speaking - Role Play for Workplace and Real-Life Situations– Reading - Cloze Reading for Language Accuracy and Contextual Understanding – Writing -Developing Hints into Structured Paragraphs	
MODULE - V : PROFESSIONAL PRESENTATION SKILLS	12
Grammar –Discourse Markers- Listening -Listening to TED Talks and Expert Presentations - Note-Making and Idea Summarization – Speaking –Elevator Pitch - Professional Storytelling Techniques – Reading - Visual Interpretation and Information Analysis - Reading Infographics, Charts, and Visual Data – Writing - Engineering Process Description.	
Total (P : 60)	

Suggested Learning Resources
Text Books : 1. Meenakshi Raman and Sangeeta Sharma. “Professional Communication”, Oxford University Press, 2023. 2. Rizvi M. Ashraf. “Effective Technical Communication”, McGraw Hill Education (India) Pvt. Ltd., 2021
Reference Books: 1. Guffey Mary Ellen and Loewy Dana. “Essentials of Business Communication”, Cengage Learning, 2023.

2. Raman M. and Sharma S. "Technical Communication: Principles and Practice", Oxford University Press, 2022.
3. Murphy Raymond. "English Grammar in Use", Cambridge University Press, 2022.
4. Butterfield Jeff. "Soft Skills for Everyone", Cengage Learning, 2021.
5. TyagiKavita and Misra Padma. "Advanced Technical Communication", PHI Learning Pvt. Ltd., 2020.



Makerspace (Product Design and Manufacturing Laboratory)							
(Common to All Branches)							
Course Code:		26GEP02			CIA		100
Course Type: (Theory/Practical/Integrated)		Practical			ESE		-
L:T:P:C		0	0	4	2	Total Marks	100
Total Hours of Pedagogy		60			Exam Hours		-
Pre-requisites		Nil					
Course Objectives							
To apply the basic knowledge of Computer-Aided Design (CAD), manufacturing processes, and 3D printing technology to develop a functional prototype model through hands-on practice.							
Course Outcomes						Cognitive Level	Weightage of COs in ESE
The students will be able to							
CO 1	Sketch and develop basic component designs from innovative ideas.					Ap	-
CO 2	Develop 3D CAD models for digital prototyping.					Ap	-
CO 3	Operate basic fabrication tools and equipment safely to develop simple prototype components.					Ap	-
CO 4	Perform machining and manufacturing operations to produce prototype parts with specified dimensions.					Ap	-
CO 5	Fabricate and assemble components to produce functional prototype models.					Ap	-

Mapping of Cos with POs / PSOs													
COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	3		3		2			2			2		
CO 2	3		3		3			2			2		
CO 3	2		3		2			2		2	2		
CO 4	3		3		2			2		2	2		
CO 5	2		3		2			3	3	2	2		
CO (W.A)	2.6		3		2.2			2.2	3	2	2		

List of Experiments:**PART A – Product Design Lab**

1. Select a simple product idea.
2. Prepare freehand sketches (top, front, and side views) with component detailing.
3. Develop 3D CAD models of the components using CAD software.
4. Convert the CAD model to STL format and perform engineering analysis.
5. Fabricate the component using a 3D printer.
6. Perform post-processing to improve the quality, appearance, and functionality of the printed component.

PART B – Manufacturing Lab

1. Product Ideation and Design.
 - Select a simple innovative product.
 - Prepare freehand sketches with component detailing.
2. Manufacturing of Components.
 - Prepare a simple process plan and select suitable materials.
 - Manufacture components using appropriate workshop machines (CO₂ laser cutter, CNC wood router, lathe-cum-milling machine, and power tools).
3. Joining and Assembly.
 - Join the components using suitable joining processes (welding, riveting, or adhesive bonding).
 - Assemble the components into a functional product.
4. Testing and Evaluation.
 - Perform basic performance evaluation.
 - Conduct functional testing of the assembled product.

Total = P : 60**Suggested Learning Resources****Text Books:**

- 1) Wang, W. (2010). Reverse engineering: Mechanisms, structures, systems & materials. CRC Press.
- 2) Stephen Christena, Learn to Weld: Beginning MIG Welding and Metal Fabrication Basics, Crestline Books, 2014.
- 3) H. Lipson, Fabricated - The New World of 3D Printing, Wiley, 1st edition, 2013.

Reference Books:

- 1) Makerspace (Product Design and Manufacturing Laboratory Manual)

Software:

- 1) Fusion 360



YOGA FOR YOUTH EMPOWERMENT (Common to All Branches)							
Course Code:	26GYP01				CIA	100	
Course Type: (Theory/Practical/Integrated)	Practical				ESE	-	
L:T:P:C	0	0	2	1	Total Marks	100	
Total Hours of Pedagogy	30				Exam Hours	-	
Prerequisite	Nil						
Course Objectives							
1. To develop students' character and ethical values through value-based education. 2. To apply yogic principles and healthy lifestyle practices to enhance physical well-being and maintain youthfulness.							
Course Outcomes					Cognitive Level	Weightage of COs in ESE	
The students will be able to							
CO 1	Apply yoga and physical exercises for a healthy life.				Ap	Internal Assessment	
CO 2	Explain the principles of Kayakalpa for maintaining health and youthfulness.				U		
CO 3	Practice meditation techniques for mental well-being.				Ap		
CO 4	Demonstrate individual and social values in daily life.				Ap		
CO 5	Analyze the importance of introspection and moral values for personal development				An		

Mapping of COs with POs / PSOs													
COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1						2	1				2		
CO 2										2	3		
CO 3						2	1	2			3		
CO 4						2	2	3	2	2	3		
CO 5										2	3		
CO (W.A)						2	1	2	1	2	3		

UNIT- I : PHYSICAL HEALTH	6
Sky – Introduction – Education as a means for Youth Empowerment – Greatness of Education – Yoga for Youth Empowerment. Simplified Physical Exercise Explanation – Hand, Leg, Breathing and Eye exercises – Kapalabathi, Makarasanam, Massaging, Acupressure and Relaxation practices – Benefits, Pranayamam: Nadi Saddhi – Clearance – Explanation Benefits.	
UNIT- II : STRENGTHENING LIFE FORCE	6
Reasons for Diseases: Natural Reasons – Artificial Reasons, Philosophy of Kayakalpa – Physical Body – Sermlinal Fluid – Life Force – Biomagnetism – Mind, Maintaining Youthfulness – Postponing Aging – Transformation of food into Seven Body Constitutes Greatness of Sermlinal fluid, Limit and method in five factors - Managing infatuation, Kayakalpa Practice – Toning up of nerves – Ojas Breathing – Benefits.	
UNIT- III : WELLNESS OF MIND	6
Classification of mind waves – Agna Meditation - Benefits, Shanthi meditation – Benefits, Thuriya meditation – Benefits. Blessing and its benefits : Auto suggestion – Blessing the family and others – Blessing the World – Divine Protection.	
UNIT- IV : VIRTUES : INDIVIDUAL VIRTUES	6
Self Control – Self Confidence – Speaking truth, Contentment - Humility – Mind Control., Tolerance – Adjustment – Sacrifice – Forgiveness, Cleanliness - External, Mental, Inner Cleanliness. Societal Virtues: Ahimsa – Service, Patriotism – Equality, Respecting the parents and elders – Caring for them – Respecting Teachers, Punctuality – Time management.	
UNIT- V : MORALS	6
Importance of Introspection : I and Mine, Six temperaments: Greed – Anger – Miserliness – Immoral Sexual Passion – Inferior Superior Complex – Vengeance, Manovering the Six Temperaments: Contentment – Tolerance - Charity – Parity – Forgiveness, Five important Benefits of Meditation, Perspicacity – Magnanimity – Adaptability – Receptivity – Creativity, Enhancing Memory – Effective Examination Preparation.	
Total (P : 30)	

Web links and Video Lectures (e-Resources):

www.vethathiri.edu.in



தமிழரும் தொழில்நுட்பமும் - TAMILS AND TECHNOLOGY

(Common to All Branches)

Course Code:	26GYA02				CIA	40
Course Type: (Theory/Practical/Integrated)	Theory				ESE	60
L:T:P:C	1	0	0	1	Total Marks	100
Total Hours of Pedagogy	15				Exam Hours	3
Prerequisite	Heritage of Tamils					

பாடத்திட்டத்தின்நோக்கம்

1. பழந்தமிழிடமிருந்த அறிவியல் தொழில்நுட்பங்களை மாணவர்களுக்கு உரைத்தல்.

Course Outcomes	Cognitive Level	Weightage of COs in ESE
CO 1 நூல்நூற்றல், சாயமிடல், பானைவனைதல், தமிழ்பிராமிஎழுத்துவடிவங்களைமாணவர்களுக்குஉணர்த்துதல்.	An	20%
CO 2 வீடு, கோவில், கட்டுமானவடிவமைப்பு, காலந்தோறும்மாறிவரும்நுட்பங்களைஅறிதல்.	U	20%
CO 3 இரும்புபயன்பாடு, நாணயவடிவமைப்பு, மணிஉருவாக்குதலின்தொழில்நுட்பங்களைஅறிதல்.	U	20%
CO 4 நீர்மேலாண்மை, பயிர்சாகுபடி, கடல்வளம்உணர்தல்.	R	20%
CO 5 தமிழ்மொழியைகணினிவழிபயன்படுத்தும்தகைகளைதெரிந்துகொள்ளுதல்.	U	20%

அலகு 1 நெசவுமற்றும்பானைத்தொழில்நுட்பம்	3
நெசவுத்தொழில்-பானைத்தொழில்நுட்பம்-கருப்புசிவப்புபண்டங்கள் - பாண்டங்களில்கீறல்குறியீடுகள்	
அலகு 2 வடிவமைப்புமற்றும்கட்டிடத்தொழில்நுட்பம்	3
சங்ககாலத்தில்வடிவமைப்புமற்றும்கட்டுமானங்கள் - சிலப்பதிகாரத்தில்மேடைஅமைப்பு- மாமல்லபுரம்சிற்பங்களும்கோவில்களும்-தஞ்சைபெரியகோயில்-மதுரைமீனாட்சிஅம்மன்ஆலயம் - செட்டிநாட்டுவீடுகள்-சென்னையில்இந்தோசாரோசெனிக்கட்டிடக்கலை	
அலகு 3 உற்பத்தித்தொழில்நுட்பம்	3
கப்பல்கட்டும்கலை-இரும்புஉருக்குதல்-நாணயங்கள்அச்சடித்தல் - கல்மணிகள், கண்ணாடிமணிகள், சுடுமண்மணிகள், சங்குமணிகள்-தொல்லியல்	
அலகு 4 வேளாண்மைமற்றும்நீர்பாசனத்தொழில்நுட்பம்	3
கல்லணை - சோழர்காலகுமிழித்தூம்பு - வேளாண்மைமற்றும்வேளாண்மைசார்ந்தசெயல்பாடுகள்- கடல்சார்அறிவு - முத்துக்குளித்தல்	
அலகு 5 அறிவியல்தமிழ்மற்றும்கணினித்தமிழ்	3

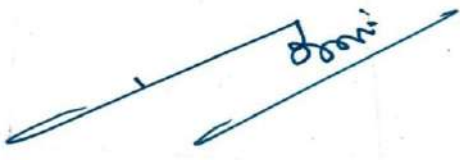
அறிவியல்தமிழின்வளர்ச்சி-தமிழ்மென்பொருட்கள்உருவாக்கம்-தமிழ்மின்நூலகம்-
இணையத்தில்தமிழ்அகராதிகள்-சொற்குவைத்திட்டம் - தமிழும்செயற்கைநுண்ணறிவும்

TOTAL(L:15)

Suggested Learning Resources

Text Books – CUM- Reference Books

1. கே.கே.பிள்ளை-தமிழகவரலாறு – மக்களும்பண்பாடும்- வெளியீடு : தமிழ்நாடுபாடநூல் மற்றும் கல்வியியல் பணிகள்கழகம்
2. முனைவர் இல.சுந்தரம்-கணினித்தமிழ்- விகடன்பிரசுரம்
3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்-தொல்லியல்துறை வெளியீடு-
4. பொருநை – ஆற்றங்கரை நாகரிகம்-தொல்லியல்துறை வெளியீடு
5. Dr.K.K.Pillay - Social life of Tamils, A join publication of TNTB & ESC and RMRL - (in print)
6. Dr.K.K.Pillay - Studies in the History of India with special reference to Tamil Nadu.(Published by: The Author)
7. Keeladi – ‘Sangam City Civilization on the Banks of River Vaigai’ (Jointly published by : Departmental Archaeology& Tamil Nadu text book and Educational Service Corporation, Tamilnadu)
8. Dr. S. V. Subrahmanian, Dr.K.D. Thirunavvukarasu - Historical Heritage of Tamils - Published by : International Institute of Tamil Studies
9. Dr. K.S. Kuppusamy, A I Vasiyak kalai – Zero Degree Publishing, 2025.



CLIMATE CHANGE AND SUSTAINABILITY

(Common to All Branches)

Course Code:	26CYB04				CIA	40
Course Type: (Theory/Practical/Integrated)	Theory				ESE	60
L:T:P:C	2	0	0	2	Total Marks	100
Total Hours of Pedagogy	30				Exam Hours	3
Prerequisite	NIL					

Course Objectives

1. To develop students ability to analyze environmental systems, including resources, ecosystems, biodiversity, and pollution, and evaluate the impact of human activities.
2. To prepare students to design sustainable solutions using principles of conservation, environmental management, and environmental laws for addressing global and local challenges.

Course Outcomes		Cognitive Level	Weightage of COs in ESE
The students will be able to			
CO 1	Evaluate natural resources and climate change impacts for sustainable conservation.	E	20%
CO 2	Examine ecosystem functions, biodiversity values and conservation strategies for ecological management.	An	20%
CO 3	Implement eco-friendly practices for pollution prevention and control.	Ap	20%
CO 4	Analyze sustainable energy and environmental management strategies for sustainable development.	An	20%
CO 5	Apply circular economy and green practices for environmental sustainability.	Ap	20%

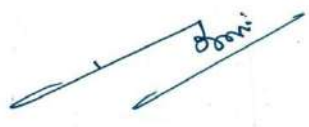
Mapping of Cos with POs / PSOs

COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	2					2							
CO 2	2					2							
CO 3	2		2			2							
CO 4		2	2			2							
CO 5		2	2			2							
CO (W.A)	2	2	2			2							

UNIT- I : NATURAL RESOURCES AND CLIMATE CHANGE	6
Environment - scope and importance - Natural resources - forest resources - deforestation - causes - effects - control measures - mineral resources - environmental effects of extracting and using mineral resources - food resources - effects of modern agriculture - fertilizer - pesticide problems - role of an individual in conservation of natural resources - Climate change - causes - effects - control measures - importance and applications of AI in climate change.	
UNIT- II :ECOSYSTEM AND BIODIVERSITY	6
Ecosystem -structure and function of an ecosystem - forest ecosystem - food chains - food webs - Biodiversity - value of biodiversity - consumptive use values- productive use values - social values - ethical values - aesthetic values - hotspots of biodiversity - threats to biodiversity - habitat loss - poaching - conservation of biodiversity - In-situ - Ex-situ conservation of biodiversity - effects of climate change on ecosystem and biodiversity.	
UNIT- III : ENVIRONMENTAL POLLUTION	6
Pollution - causes - effects and control measures of air pollution - water pollution - ozone layer depletion - acid rain - solid waste management - methods of disposal of solid waste - land filling - incineration - composting - effects of climate change on environmental pollution.	
UNIT- IV : SUSTAINABILITY AND MANAGEMENT	6
Sustainable development - factors affecting development - sustainable energy techniques - hydrogen energy - solar energy - wind energy - GDP - types - nominal GDP - real GDP - components of GDP - expenditure approach - carbon credit - carbon footprint - sources – preventivemeasures - environmental management.	
UNIT- V : SUSTAINABILITY PRACTICES	6
Zero waste and R concept - circular economy concepts - green chemistry - principles - environmental impact assessment - carbon emission - sources - effects - control measures - Environmental laws and regulations - air act - water act - role of AI in sustainability practices.	
Total (L :30)	

Suggested Learning Resources
Text Books : 1. Dr. A.Ravikrishan, Environmental Science and Engineering, Sri Krishna Hitech Publishing Co. Pvt.Ltd., Chennai,15thEdition, 2023. 2. Anubha Kaushik and C. P. Kaushik's "Perspectives in Environmental Studies", 8th Edition, New Age International Publishers, 2025.
Reference Books: 1. Rajagopalan R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, Fourth Edition, 2023. 2. Erach Bharucha "Textbook of Environmental Studies for Undergraduate Courses" Orient Blackswan Pvt. Ltd. 2025. 3. G. Tyler Miller Jr. and Scott Spoolman, Environmental Science, 17th Edition, Cengage Learning, Boston, 2024.

4. Bala Krishnamoorthy, Environmental Management: Text and Cases, 2nd Edition, PHI Learning Pvt. Ltd., New Delhi, 2023.
5. Paul T. Anastas and John C. Warner, Green Chemistry: Theory and Practice, Oxford University Press, New York, Reprint Edition, 2023.



PHYSICS OF MATERIALS							
Course Code:	26PYB04				CIA	40	
Course Type: (Theory/Practical/Integrated)	Theory				ESE	60	
L:T:P:C	3	0	0	3	Total Marks	100	
Total Hours of Pedagogy	45				Exam Hours	3	
Prerequisite	Nil						

Course Objectives

1. To provide the knowledge of wave oscillation motion and the principles of rigid body dynamics and elasticity in mechanical systems.
2. To familiarize the fundamental laws of thermodynamics and advanced engineering materials related to industrial applications.

Course Outcomes				Cognitive Level	Weightage of COs in ESE
The students will be able to					
CO 1	Analyze oscillatory motion, resonance phenomena, and wave propagation in mechanical systems.			An	20%
CO 2	Apply principles of rigid body dynamics and elasticity to engineering problems involving bending, torsion, and gyroscopic motion.			Ap	20%
CO 3	Utilize the thermal properties of materials to examine heat transfer mechanisms and implement suitable measurement techniques.			Ap	20%
CO 4	Interpret thermodynamic principles governing heat engines, refrigerators, and heat pumps.			An	20%
CO 5	Implement the concepts of structure, properties, and processing techniques to utilize advanced engineering materials in engineering applications.			Ap	20%

Mapping of Cos with POs / PSOs

COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	3	2		2									
CO 2	3		2	2	2								
CO 3	3	3	2		2								
CO 4	3			2									
CO 5	2	2	2		2								
CO (W.A)	3	2	2	2	2								

Unit- I : Oscillations And Waves	9
Oscillatory motion: Simple harmonic motion, torsional oscillator; Spring mass system - free, damped, forced oscillations and resonance; Wave motion: Plane progressive wave, attenuation of waves, phase velocity, superposition of waves and group velocity.	
Unit- II : Rigid Body Dynamics and Elasticity	9
Rigid body dynamics: Centre of mass. Moment of inertia - Elasticity – Hooke's law – stress –strain diagram, bending of beams – Young's modulus by uniform bending and non – uniform bending – Torsion Pendulum – I – shaped girders and gyroscope.	
Unit- III : Thermal Properties Of Materials	9
Modes of heat transfer - Conduction, convection and radiation - Specific heat capacity - Thermal conductivity - Measurement of thermal conductivity of a good conductor - Forbe's method - Measurement of thermal conductivity of a bad conductor - Lee's disc method - Radial flow of heat - cylindrical flow of heat - Practical applications of conduction of heat.	
Unit- IV : Material Testing Mechanisms	9
Testing of materials – classification of tests – destructive test – Non-Destructive Testing - liquid penetrant method and application - Various steps involved in NDT process - X-ray radiographic technique - application of X-ray radiography – X-ray fluoroscopy – Ultrasonic Testing.	
Unit- V : Advanced New Engineering Materials	9
Metallic glasses: types, glass forming ability of alloys, melt spinning process, applications – shape memory alloys: phases, shape memory effect, pseudo elastic effect, NiTi alloy, applications - Ceramics – types and applications – composites: classification, role of matrix and reinforcement, processing of fiber reinforced plastics and self-healing materials.	
Total (L : 45)	

Suggested Learning Resources
Text Books : - Sanjeev Gupta, S. P. Rai and R. S. Sedha, (2023), Engineering Physics, Khanna Book Publishing Company Pvt. Ltd., New Delhi. D. S. Mathur, (2022), Heat and Thermodynamics, S. Chand & Company Ltd., New Delhi.
Reference Books: P. Mani, (2023), A Textbook of Engineering Physics – Volume I, 13th Edition, Dhanam Publications, Chennai. M. N. Avadhanulu, P. G. Kshirsagar and T. V. S. Arun Murthy, A Textbook of Engineering Physics, (2024), S. Chand & Company Ltd., New Delhi. N. Subrahmanyam and Brij Lal, (2022), A Text Book of Optics, 26th Edition, S. Chand & Company Ltd., New Delhi. - Baldev Raj, T. Jayakumar and M. Thavasimuthu (2007), Practical Non-Destructive Testing, 3rd Edition, Narosa Publishing House. D. Wayne Callister Jr. and David G. Rethwisch, (2018), Materials Science and Engineering: An Introduction, 10th Edition, John Wiley & Sons, Inc.

ELECTRICAL ENGINEERING

Course Code:	26EEEC04	CIA	40
Course Type: (Theory/Practical/Integrated)	Theory	ESE	60
L:T:P:C	3 0 0 3	Total Marks	100
Total Hours of Pedagogy	45	Exam Hours	3
Pre-requisites	-		

Course Objectives

- To introduce the fundamental concepts of electricity, electrical laws, and AC/DC circuits relevant to engineering applications.
- To provide basic knowledge of electrical machines and their operating principles used in industrial and mechanical systems.
- To illustrate the operation of transformers and their applications in electrical and mechanical engineering systems.
- To develop an understanding of electric drives and their applications in mechanical engineering fields and industrial automation.

Course Outcomes

The students will be able to		Cognitive Level	Weightage of COs in ESE
CO 1	Apply the fundamental electrical laws to analyze and solve simple DC and AC electric circuits relevant to mechanical engineering applications.	Ap	20%
CO 2	Analyze the operating characteristics of DC machines and recommend suitable DC drives for engineering and industrial applications.	An	20%
CO 3	Analyze the operating characteristics of AC machines and recommend appropriate AC drives.	An	20%
CO 4	Apply the principles of operation, EMF equations, and performance characteristics of single-phase transformers and autotransformers used in engineering systems.	Ap	20%
CO 5	Analyze the operation, selection, and speed control methods of electrical drives employed in industrial applications such as textile, and paper industries.	An	20%

Mapping of COs with POs / PSOs

COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	3	3		3	3						3		
CO 2	3	3		2	2						3		
CO 3	3	3		2	2						3		

CO 4	3	2		2	2						3		
CO 5	3	3		3	2						3		
CO (W.A)	3	3		3	2						3		
Unit- I : ELECTRIC CIRCUITS												9	
DC circuits: Ohm’s Law – Kirchhoff’s Laws – Resistive circuits: Series and parallel. AC circuits: Alternating current – Voltage - RMS and average values of sinusoidal waveforms -Power and power factor.													
Unit- II : DC MACHINES												9	
DC Generator: Types – Construction and principle of operation - EMF equation – Characteristics and Applications. DC Motor: Types - Principle of operation - Torque equation - Characteristics and Applications.													
Unit- III : AC MACHINES												9	
Single phase induction motor: Types, Construction and working principle – applications. Three phase induction motor: Types, Construction and working principle - Torque – Slip Characteristics - Synchronous motor: Construction and working principle – Applications-AC Starters													
Unit- IV : TRANSFORMERS												9	
Single Phase Transformer: Types, Construction and Principle of operation - EMF Equation – Transformer in Arc welding and drilling machines) – Autotransformer.													
Unit- V : ELECTRICAL DRIVES AND ITS APPLICATION												9	
Introduction - Selection of electric drives – classifications of drives – Heating and Cooling curve-Speed control of AC drives-Breaking methods Case study: Spinning and paper mills drives.													
Total (L : 45)													

Suggested Learning Resources
Text Books :
1. D P Kothari and I.J Nagarath, “Basic Electrical and Electronics Engineering”, McGraw Hill Education (India) Private Limited, 4 th Edition, 2023
2. Dubey G.K., "Fundamentals of Electrical Drives", Narosa Publishing House, New Delhi, 2nd edition, Reprint 2020
Reference Books:
1. Muthusubramanian and S Salivahanan, “Basic Electrical and Electronics Engineering” , Education,2nd Edition, McGraw Hill, 2024.
2. V.K. Mehta and Rohit Mehta, <i>Principles of Electrical Engineering and Electronics (LPSPE)</i> , S. Chand Publishing, Revised Edition,2019.

3. S.K. Bhattacharya, Basic Electrical Engineering, Pearson Education, 1st Edition, 2019.
4. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw-Hill, New Delhi, 4th Edition, 2019.
5. Arun Ingle, 'Switch Gear and Protection' Pearson Education, 1st Edition, 2018.

G. S. K.

Engineering Mechanics							
Course Code:		26MEC03			CIA		40
Course Type: (Theory/Practical/Integrated)		Theory			ESE		60
L:T:P:C		3	1	0	4	Total Marks	100
Total Hours of Pedagogy		60			Exam Hours		3Hrs
Pre-requisites		Nil					
Course Objectives							
- To introduce the fundamentals of statics and rigid body principles for determining forces and reactions in two-dimensional concurrent and non-concurrent force systems. - To impart the concepts of centroid, moment of inertia, and related theorems for determining the properties of surfaces used in engineering applications. - To understand the principles of friction and kinematics to solve engineering problems involving frictional systems and motion of particles. - To explain the application of dynamic laws and principles to solve engineering problems involving particle motion and elastic impact.							
Course Outcomes						Cognitive Level	Weightage of COs in ESE
The students will be able to							
CO 1	Apply the principles of statics to determine resultant forces and support reactions under equilibrium conditions in two-dimensional concurrent force systems.					Ap	20%
CO 2	Determine the location of resultant forces and support reactions in beams and trusses under equilibrium conditions in two-dimensional non-concurrent force systems using the concepts of rigid body equilibrium.					Ap	20%
CO 3	Determine the inertia properties of simple and composite sections using the principles of centroid and moment of inertia.					Ap	20%
CO 4	Analyze simple contact friction problems using friction principles and the motion of particles using kinematic principles.					An	20%
CO 5	Apply dynamic principles to analyze the motion of rigid particles and the elastic bodies.					Ap	20%

Mapping of COs with POs / PSOs													
COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	3	3		2					2		2	3	
CO 2	3	3							2		2	3	
CO 3	3	3							2		2	3	

CO 4	3	3		2					2		2	3	
CO 5	3	3		2					2		2	3	
CO (W.A)	3	3		2					2		2	3	

Unit- I :STATICS OF PARTICLE	(9+3)
Units and dimensions - fundamental principles - laws of mechanics, Lami's theorem, parallelogram and triangular law of forces, principle of transmissibility – system forces - statics of particles in two dimensions - resultant force - coplanar concurrent forces - Free body diagram - equilibrium of particles in two dimensions.	
Unit- II :STATICS OF RIGID BODY	(9+3)
Statics of rigid body in two dimensions - rigid body - moment of a force about a point - Varignon's theorem - resultant force for coplanar parallel and non concurrent forces - moments and couples - types of supports and their reactions- requirements of stable equilibrium -equilibrium of rigid bodies in two dimensions -Trusses : method of joints	
Unit- III :PROPERTIES OF SURFACES AND SOLIDS	(9+3)
Determination of Areas and Volumes - First Moment of Area and Centroid of Sections - T Section - I Section - Angle Section - Hollow Section from Primary Simpler Sections - Second Moment of Plane Areas - Parallel Axis Theorem and Perpendicular Axis Theorem – T Section - I Section - Angle Section - Hollow Section - Polar Moment of Inertia - Product of Inertia.	
Unit- IV :FRICTION AND RECTILINEAR MOTION OF PARTICLES	(9+3)
Friction: Laws of friction, Coefficients of Friction, Angles of Friction, Types of Friction Problems, Ladder friction - Wedges friction - Belt friction. Rectilinear Motion of Particles: Displacement Velocity and Acceleration and their Relationship - Relative Motion- Curvilinear Motion - Projectile Motion.	
Unit- V :DYNAMICS OF PARTICLES	(9+3)
Dynamics of Particles: Newton's Law, Work Energy and Impulse Momentum Principles- General Plane Motion. Impact of Elastic Bodies.	
Total (L :45 + T : 15) = 60	

Suggested Learning Resources
Text Books :
1.Rajasekaran.S and Sankarasubramanian.G, "Fundamentals of Engineering Mechanics", 3rd ed., vikas Publishing House Pvt.Ltd. New Delhi, 2018.
2.N.Kottiswaran "Engineering Mechanics Statics and Dynamics" 4th ed.,Sri Balaji Publications 2010
Reference Books:
1. Irving H. Shames, "Engineering Mechanics: Statics and Dynamics", Prentice Hall of India Private limited, 2006.

2. Russell C Hibbeler, "Engineering Mechanics: Statics and Dynamics", 14th ed., Prentice Hall, 2016.
3. Anthony M. Bedford and Wallace Fowler, "Engineering Mechanics: Statics and Dynamics", 5th ed., Prentice Hall, 2008.
4. Palanichamy, M.S and Nagan,S, "Engineering Mechanics - Statics and Dynamics", 3rd ed., Tata McGraw-Hill, New Delhi, 2005.
5. Meriam.J.L , Kraige.L.G, and Boltan, J.N "Engineering Mechanics: Statics and Dynamics", 9th ed., Wiley Publishers, 2020.



ENGLISH PROFICIENCY LAB

(Common to All Branches)

Course Code:	26EYP02				CIA	60
Course Type: (Theory/Practical/Integrated)	Practical				ESE	40
L:T:P:C	0	0	2	1	Total Marks	100
Total Hours of Pedagogy	30				Exam Hours	3
Prerequisite	26EYP01					
Course Objectives						
3. To improve real-time communication and interaction skills						
4. To enhance digital, collaborative, and workplace communication						
Course Outcomes					Cognitive Level	Weightage of COs in ESE
The students will be able to						
CO 1	Communicate effectively in collaborative and workplace situations.				Ap	20%
CO 2	Demonstrate fluency in professional and interpersonal interactions.				Ap	20%
CO 3	Respond effectively to real-world communication contexts.				Ap	20%
CO 4	Apply creative and analytical thinking in communication tasks.				Ap	20%
CO 5	Create clear oral and written communications for academic, social, and professional purposes.				C	20%

Mapping of Cos with POs / PSOs													
Cos	Pos											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1								2	3	-	2		
CO 2								2	3	-	2		
CO 3								2	3	-	2		
CO 4								2	3	-	2		
CO 5								2	3	-	2		
CO (W.A)								2	3	-	2		
Module - I :Interactive Communication Skills													6
Grammar –If Conditional Clauses - Listening - Listening to Engineering Project Briefings and Response Analysis- Speaking - Expressing Opinions through Agree–Disagree Circles													
Module - II :Workplace Communication													6
Grammar –Active and Passive Voice - Reading - Reading Corporate Communication Samples – Writing - Drafting LinkedIn Profile Summaries													
Module - III :Real-World Communication													6

Grammar – Synonyms & Antonyms - Listening - Listening to Travel Vlogs and Experience Narration – Speaking – Tech-Talk Video Presentation	
Module - IV : Technical Communication	6
Grammar – Articles– Reading - Reading Technology Blogs – Writing - Writing Captions for Technical Posters	
Module - V :Professional Interaction Skills	6
Grammar –Confusable Words - Listening - Listening to Interview Experiences and Career Talks – Speaking – Resolving a conflict in a team project	
Total (P: 30)	
Suggested Learning Resources	
Text Books : - Sanjay Kumar and PushpLata, "Communication Skills", Oxford University Press, Third Edition, 2023. - Meenakshi Raman and Sangeeta Sharma, "Professional Communication", Oxford University Press, Third Edition, 2022.	
Reference Books: - Barun K. Mitra, "Personality Development and Soft Skills", Oxford University Press, Second Edition, 2023. - Flatley, Marie E. and Rentz, Kathryn. "Business Communication: Connecting in a Digital World", McGraw Hill Education, 2022. - Murphy, Herta A., Hildebrandt, Herbert W. and Thomas, Jane P. "Effective Business Communication", McGraw Hill Education, 2022. - Raman, Meenakshi and Sharma, Sangeeta. "Technical Communication: Principles and Practice", Oxford University Press, 2021. D. Sudha Rani, "English for Professional Communication", Pearson Education, Second Edition, 2021.	



PHYSICS LABORATORY

(Common to All Branches)

Course Code:	26PYP01				CIA	60
Course Type: (Theory/Practical/Integrated)	Theory				ESE	40
L:T:P:C	0	0	2	1	Total Marks	100
Total Hours of Pedagogy	30				Exam Hours	2
Prerequisite	Nil					

Course Objectives

1. To infer the practical knowledge by applying the experimental methods to correlate with the Physics theory.
2. To introduce different experiments to test basics of physics concepts applied in optics and electronics.

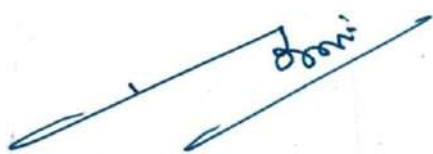
Course Outcomes					Cognitive Level	Weightage of COs in ESE
The students will be able to						
CO 1	Apply elasticity concepts to determine mechanical and thermal properties of materials using experimental methods.				Ap	20%
CO 2	Evaluate optical phenomena using laser, diffraction, and interference techniques.				Ev	20%
CO 3	Apply semiconductor concepts to determine band gap energy and solar cell characteristics.				Ap	20%
CO 4	Analyze electrical and magnetic properties using Ohm's law and B-H curve experiments.				An	20%
CO 5	Apply modern physics concepts to determine Planck's constant using electroluminescence.				Ap	20%

Mapping of Cos with POs / PSOs

COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	3	2		1									
CO 2	3	3											
CO 3	3	3	1	1									
CO 4	3	2											
CO 5	3	2											
CO (W.A)	3	2	1	1									

LIST OF EXPERIMENTS:

1. Determination of Young's modulus by non-uniform bending method.
2. Determination of (a) wavelength and (b) particle size using Laser.
3. Determination of thermal conductivity of a bad conductor – Lee 's Disc method.
4. Determination of wavelength of mercury spectrum – spectrometer grating.
5. Determination of band gap of a semiconductor.
6. Determination of thickness of a thin wire – Air wedge method.
7. Determination of V-I characteristics of solar cell.
8. Experiments on electromagnetic induction B-H Curve experiment to determine magnetic parameter.
9. Verify Ohm's law – Series and parallel Connection.
10. Determination of Planck's constant using electroluminescence process.

TOTAL (P:30)

LIFE SKILLS FOR ENGINEERS

(Common to All Branches)

Course Code:	26MAN03	CIE	100
Course Type: (Theory/Practical/Integrated)	Integrated	ESE	-
L:T:P:C	1 0 2 1	Total Marks	100
Total Hours of Pedagogy	45	Exam Hours	1 hour
Pre-requisites	Nil		

Course Objectives

1. To enhance self-awareness, interpersonal skills, and resilience to prepare students for the professional and personal challenges of engineering careers and life beyond academics.
2. To equip engineering students with essential life skills encompassing personal and emotional development, effective management of time and stress, financial literacy, digital safety, and personal wellness.
3. To impart and cultivate analytical reasoning, innovative thinking, effective collaboration, and ethical leadership to prepare students for complex challenges in professional and personal environments

Course Outcomes		Cognitive Level	Weightage of COs in ESE
The students will be able to			
CO 1	Display self-awareness, emotional intelligence, and resilience through reflection and personal development activities.	A	-
CO 2	Demonstrate effective communication, empathy, collaboration, and interpersonal skills during team-based activities.	P	-
CO 3	Apply creative, critical-thinking, and problem-solving strategies to address real-life and professional challenges.	C	-
CO 4	Exhibit leadership, accountability, adaptability, and ethical conduct while participating in individual and group tasks.	A	-
CO 5	Practice responsible behaviors related to wellness, financial management, digital citizenship, and lifelong learning.	B	-

COs	POs										
	1	2	3	4	5	6	7	8	9	10	11
CO 1						2					2
CO 2							2	3	3		
CO 3		3	2								
CO 4			2			2	2	2	2		
CO 5						2	2			3	3
CO (W.A)		3	2			2	2	2.5	2.5	3	3

Unit- I : SELF-MANAGEMENT

9

Self-Awareness, Emotional Intelligence, Personal Effectiveness, Positive Attitude, Stress Management, Resilience, Goal Setting, Time Management, Adaptability.

Activities: Personality Assessment and Reflection, Vision Board Creation, Weekly Time Audit, Cone grab, Blind

Polygon, Baba-Baby-Ball, Pushing Boundaries.	
Unit- II : INTERPERSONAL SKILLS & COLLABORATION	9
Communication, Active Listening, Empathy, Interpersonal Relationships, Trust Building, Team Roles, Team Collaboration, Conflict Management. Activities: Baton pass, Blindfold Walk, Human Knot, Minefield, Helium Stick, Pipe & ball.	
Unit- III :INNOVATIVE THINKING & PROBLEM SOLVING	9
Critical Thinking, Creativity, Problem Solving, Decision Making, Analytical Reasoning, Lateral Thinking, Scientific Temperament. Activities: 30 Circles Challenge, Key Punch, Tarp Hole Game, Toxic Waste, River Crossing Challenge, T-Puzzle & Square Puzzle	
Unit- IV :LEADERSHIP & PROFESSIONAL RESPONSIBILITY	9
Leadership Styles, Leadership Initiative, Motivation, Delegation, Accountability, Adaptive Leadership, Professional Responsibility, Decision Making. Activities: Human Crane, Number Roll, Snake Walk, Super Airways, Leaky Pipe Game, Leadership Style Assessment & Reflection.	
Unit- V : LIFE & CAREER MANAGEMENT	9
Financial Literacy, Budgeting and Saving, Digital Citizenship and Online Safety, Health and Wellness, Professional Ethics, Lifelong Learning. Activities: Bank It! – Choice vs Chance Simulation, Budget Planning Challenge, Digital Safety Scenarios, Wellness Challenge, Community Service Project, Learning Sprint Challenge.	
Total (15 + 30 : 45)	

Suggested Learning Resources
Text Books : 1. ICT Academy of Kerala, Life Skills for Engineers, McGraw Hill Education (India) Private Limited, 2016. 2. Kolb, D.A., Experiential Learning: Experience as the Source of Learning and Development, 2nd Edition, Pearson Education, 2015.
Reference Books: 1. Goleman, D., Emotional Intelligence: Why It Can Matter More Than IQ, 25th Anniversary Edition, Bloomsbury Publishing, 2021 2. Johnson, D.W. and Johnson, F.P., Joining Together: Group Theory and Group Skills, 12th Edition, Pearson

Education, 2021

3. Northouse, P.G., Leadership: Theory and Practice, 10th Edition, SAGE Publications, 2025.
4. Chambers, H., Skills for New Managers, 2nd Edition, McGraw-Hill Education, 2017.
5. Heifetz, R., Grashow, A. and Linsky, M., The Practice of Adaptive Leadership: Tools and Tactics for Changing Your Organization and the World, Harvard Business Press, 2009.

A handwritten signature in black ink, appearing to be 'Paul', written on a light blue background.