NANDHA ENGINEERING COLLEGE

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

Curriculum and Syllabi

for

B.E – ELECTRICAL AND ELECTRONICS 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 – ELECTRICAL AND ELECTRONICS ENGINEERING	
VISION	• To foster academic excellence imparting knowledge in Electrical, Electronics and allied disciplines to meet the changing needs of the society.
MISSION	• To equip the students with leadership qualities for accepting the challenges in various engineering sectors • To excel in the thrust areas of Electrical and Electronics Engineering to solve real world problems • To empower the students to adapt the latest technologies by providing innovative learning environment
PROGRAMME EDUCATIONAL OBJECTIVES (PEO)	The graduates of Electrical and Electronics Engineering will be **PEO1: Core Competency:** A Successful professionals with domain knowledge in Electrical and Electronics Engineering using emerging techniques. **PEO2: Research, Innovation and Entrepreneurship:** Able to demonstrate multi-disciplinary skills through innovation and research to meet the societal needs **PEO3: Ethics, Human values and Life-long learning:** Able to demonstrate ethical practices and managerial skills through continual learning.
PROGRAMME SPECIFIC OUTCOMES (PSO)	The students of Electrical and Electronics Engineering will be able to • Analyze, design and validate processes, products by applying knowledge and skills in Power system, Electrical Machines and Power Electronics. • Design and analyze the processes of smart grid and renewable energy systems using appropriate tools and techniques

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. ELECTRICAL AND ELECTRONICS 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 Programme	M						
SEMESTER: I									
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	26GYA01	□□□□□□ □□□□ / Heritage of Tamils	HUM	T	1	0	0	1	1
4	26CSC01	C Programming	ES (G)	T	3	0	0	3	3
5	22MEC01	Engineering Drawing and Graphics	ES(G)	LIT	3	0	2	4	5
6	26EEC01	Fundamentals of Electrical Engineering	ES (G)	T	2	1	0	3	3
7	26EYP01	English Communication Lab	HUM	L	0	0	4	2	4
8	26GEP02	Makers space	SD	L	0	0	4	2	4
9	26CSP01	C Programming Laboratory	ES (G)	L	0	0	3	1.5	3
10	26GYP01	Yoga for a Youth Empowerment	HUM	L	0	0	2	1	2
				TOTAL	**14**	**2**	**17**	**24.5**	**33**

SEMESTER: II									
S. No.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**COURSE TYPE**	**TEACHING AND LEARNING SCHEME**			**CREDITS**	**TCP**
					L	**T**	**P**		
1	26MYB07	Applied Transform Techniques and Complex Functions	BS	T	3	1	0	4	4
2	26PYB06	Applied Physics for Electrical and Electronics Engineering	BS	T	3	0	0	3	3
3	26CYB04	Climate Change and Sustainability	BS	T	2	0	0	2	2
4	26GYA02	□□□□□□□□	HUM	T	1	0	0	1	1

		□□□□□□□□□□□□□□□□ / Tamils and Technology							
5	26CSC02	Data structure	ES(G)	T	3	0	0	3	3
6	26EEC05	Electric Circuits and Network Analysis	ES (PC)	LIT	3	0	2	4	5
7	26PYP01	Physics Laboratory	HUM	L	0	0	2	1	2
8	26EYP02	English Proficiency Laboratory	HUM	L	0	0	2	1	2
9	26CSP02	Data structure Laboratory	ES(G)	L	0	0	3	1.5	3
10	26GEP01	Foundation Laboratory	SD	L	0	0	4	2	4
11	26GEP03	Life skills for Engineers	ES(G)	-	1	0	2	1	3
12	26GEA01	Analytical Skills- I	ES(G)	T	2	0	0	1	2
				TOTAL	**18**	**1**	**15**	**24.5**	**34**

SEMESTER: III									
S. No.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**COURSE TYPE**	**TEACHING AND LEARNING SCHEME**			**CREDITS**	**TCP**
					L	**T**	**P**		
1	XXXX	Applied Probability, Statistics and Numerical Methods	BS	T	3	1	0	4	4
2	XXXX	Electronic Devices and Circuits	ES (PC)	LIT	3	0	2	4	5
3	XXXX	Digital Logic System Design	ES (PC)	T	3	0	0	3	3
4	XXXX	Signals and systems	ES (PC)	T	3	0	0	3	3
5	XXXX	Electromagnetic fields	ES (PC)	T	3	0	0	3	3
6	XXXX	Electrical Machines-I	ES (PC)	T	3	0	0	3	3
7	XXXX	Electrical Machines-I Laboratory	ES (PC)	L	0	0	3	1.5	3
8	XXXX	English Competency Laboratory	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
11	XXXX	Design Thinking	ES(G)	T	2	0	0	2	2
				TOTAL	**24**	**1**	**7**	**25.5**	**32**

SEMESTER: IV									
S. No.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**COURSE TYPE**	**TEACHING AND LEARNING SCHEME**			**CREDITS**	**TCP**
					L	**T**	**P**		
1	XXXX	Electrical Machines-II	ES (PC)	T	3	0	0	3	3
2	XXXX	AI For Electrical Engineering	ES (PC)	T	3	0	0	3	3
3	XXXX	Transmission and Distribution	ES (PC)	T	3	0	0	3	3
4	XXXX	Control Systems	ES (PC)	T	3	0	0	3	3
5	XXXX	Analog integrated Circuits	ES (PC)	LIT	3	0	2	4	5
6	XXXX	Measurement and Instrumentation	ES (PC)	LIT	3	0	2	4	5
7	XXXX	Electrical Machines-II Laboratory	ES (PC)	L	0	0	3	1.5	3
8	XXXX	Workplace English Lab	HUM	L	0	0	2	1	2
9	XXXX	Analytical Skills- -III	ES(G)	T	2	0	0	1	2
10	XXXX	Personality and Character Development	SD	-	0	0	1	0	1
11	XXXX	Micro Project	SD		0	0	4	2	4
				TOTAL	**20**	**0**	**14**	**25.5**	**34**

SEMESTER: V									
S. No.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**COURSE TYPE**	**TEACHING AND LEARNING SCHEME**			**CREDITS**	**TCP**
					L	**T**	**P**		
1	XXXX	Introduction to Standards in EEE	ES (PC)	T	1	0	0	1	1
2	XXXX	Microprocessor and Microcontrollers	ES (PC)	LIT	3	0	2	4	5
3	XXXX	Power Electronics	ES (PC)	LIT	3	0	2	4	5
4	XXXX	Power system Analysis	ES (PC)	T	3	0	0	3	3
5	XXXX	PE	ES (PE)	T	3	0	0	3	3
6	XXXX	PE	ES (PE)	T	3	0	0	3	3
7	XXXX	PE/OE	ES (PE/OE)	T	3	0	0	3	3
8	XXXX	Indian Knowledge Systems	M	T	2	0	0	0	2
				TOTAL	**20**	**0**	**4**	**21**	**25**

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	Power system operation and control	ES (PC)	LIT	3	0	2	4	5
3	XXXX	IoT	ES (PC)	LIT	3	0	2	4	5
4	XXXX	Electric Drives and Control	ES (PC)	T	3	0	0	3	3
5	XXXX	PE	ES (PE)	T	3	0	0	3	3
6	XXXX	PE/OE	ES (PE/OE)	T	3	0	0	3	3
7	XXXX	Comprehension	SD	T	2	0	0	2	2
8	XXXX	Mini Project	SD		0	0	4	2	4
				TOTAL	**17**	**0**	**10**	**24**	**29**

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	PLC and Automation	ES (PC)	T	3	0	0	3	3
2	XXXX	PE	ES (PE)	T	3	0	0	3	3
3	XXXX	PE	ES (PE)	T	3	0	0	3	3
4	XXXX	PE	ES (PE)	T	3	0	0	3	3
5	XXXX	OE	ES (OE)	T	3	0	0	3	3
6	XXXX	Internship/Industry training	SD					2	
7	XXXX	Research Paper Writing^	M						2
				TOTAL	**15**	**0**	**0**	**17**	**17**

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 / Internship cum Project Work	SD	PW	0	0	16	8	8
				TOTAL	**0**	**0**	**16**	**8**	**8**

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	□□□□□□ □□□□ / 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 a Youth Empowerment	HUM	L	0	0	2	1	2
4	26GYA02	□□□□□□□□ □□□□□□□□□□□□□□ □□ / Tamils and Technology	HUM	T	1	0	0	1	1
5	26PYP01	Physics Laboratory	HUM	L	0	0	2	1	2
6	26EYP02	English Proficiency Laboratory	HUM	L	0	0	2	1	2
7	XXXX	English Competency Laboratory	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	26MYB07	Applied Transform Techniques and Complex Functions	BS	T	3	1	0	4	4

4	26PYB06	Applied Physics for Electrical and Electronics Engineering	BS	T	3	0	0	3	3
5	26CYB04	Climate Change and Sustainability	BS	T	2	0	0	2	2
6	XXXX	Applied Probability, Statistics and Numerical Methods	BS	T	3	1	0	4	4

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	26CSC01	C Programming	ES (G)	T	3	0	0	3	3
2	22MEC01	Engineering Drawing and Graphics	ES(G)	LIT	3	0	2	4	5
3	26EEC01	Fundamentals of Electrical Engineering	ES (G)	T	2	1	0	3	3
4	26CSP01	C Programming Laboratory	ES (G)	L	0	0	3	1.5	3
5	26CSC02	Data structure	ES(G)	T	3	0	0	3	3
6	26CSP02	Data structure Laboratory	ES(G)	L	0	0	3	1.5	3
7	26GEP03	Life skills for Engineers	ES(G)	-	1	0	2	1	3
8	26GEA01	Analytical Skills- I	ES(G)	T	2	0	0	1	2
9	XXXX	Analytical Skills- II	ES(G)	T	2	0	0	1	2
10	XXXX	Design Thinking	ES(G)	T	2	0	0	2	2
11	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	26EEC05	Electric Circuits and Network Analysis	ES (PC)	LIT	3	0	2	4	5
2	XXXX	Electronic Devices and Circuits	ES (PC)	LIT	3	0	2	4	5
3	XXXX	Digital Logic System Design	ES (PC)	T	3	0	0	3	3
4	XXXX	Signals and systems	ES (PC)	T	3	0	0	3	3
5	XXXX	Electromagnetic fields	ES (PC)	T	3	0	0	3	3
6	XXXX	Electrical Machines-I	ES (PC)	T	3	0	0	3	3
7	XXXX	Electrical Machines-I Laboratory	ES (PC)	L	0	0	3	1.5	3
8	XXXX	Electrical Machines-II	ES (PC)	T	3	0	0	3	3
9	XXXX	AI For Electrical Engineering	ES (PC)	T	3	0	0	3	3
10	XXXX	Transmission and Distribution	ES (PC)	T	3	0	0	3	3
11	XXXX	Control Systems	ES (PC)	T	3	0	0	3	3
12	XXXX	Analog integrated Circuits	ES (PC)	LIT	3	0	2	4	5
13	XXXX	Measurement and Instrumentation	ES (PC)	LIT	3	0	2	4	5
14	XXXX	Electrical Machines-II Laboratory	ES (PC)	L	0	0	3	1.5	3
15	XXXX	Introduction to Standards in EEE	ES (PC)	T	1	0	0	1	1
16	XXXX	Microprocessor and Microcontrollers	ES (PC)	LIT	3	0	2	4	5
17	XXXX	Power Electronics	ES (PC)	LIT	3	0	2	4	5
18	XXXX	Power system Analysis	ES (PC)	T	3	0	0	3	3
19	XXXX	Power system operation and control	ES (PC)	LIT	3	0	2	4	5
20	XXXX	IoT	ES (PC)	LIT	3	0	2	4	5
21	XXXX	Electric Drives and Control	ES (PC)	T	3	0	0	3	3

22	XXXX	PLC and Automation	ES (PC)	T	3	0	0	3	3

Skill Development Courses - SD

S. No.	COURSE CODE	COURSE TITLE	CATEGORY	COURSE TYPE	TEACHING AND LEARNING SCHEME			CREDITS	TCP
					L	T	P		
1	26GEP02	Makers space	SD	L	0	0	4	2	4
2	26GEP01	Foundation Laboratory	SD	L	0	0	4	2	4
3	XXXX	Personality and Character Development	SD	-	0	0	1	0	1
4	XXXX	Micro Project	SD		0	0	4	2	4
5	XXXX	Comprehension	SD	T	2	0	0	2	2
6	XXXX	Mini Project	SD		0	0	4	2	4
7	XXXX	Internship/Industry training	SD					2	
8	XXXX	Project Work / Internship cum Project Work	SD	PW	0	0	16	8	8

Mandatory Courses - M

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

SEMESTER WISE CREDIT DISTRIBUTION

SEMESTER	HUM	BS	ES (G)	ES(PC)	ES(PE)	ES(PE/OE)	ES(OE)	SD
I	4	7	11.5					2
II	3	9	6.5	4				2
III	1	4	3	17.5				
IV	1		1	21.5				2
V				12	6	3		
VI	3			11	3	3		4
VII				3	9		3	2
VIII								8
Total	12	20	22	69	18	6	3	20

Credits Total: 170

INDUCTION PROGRAMME
(Common to All Branches)

Course Code:	IP3151				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 The students will be able to		Cognitive Level	Weightage of COs in ESE
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.

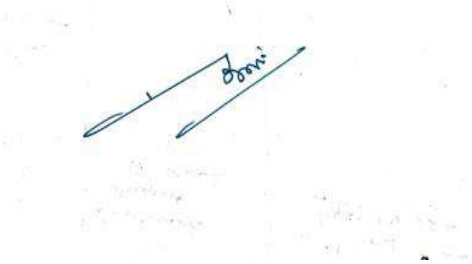
(ix) Department Specific Activities

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



LINEAR ALGEBRA AND APPLIED CALCULUS *(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
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
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 COswith 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		

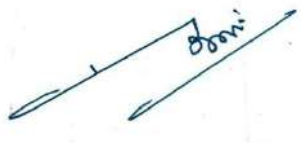
UNIT- I : WATER TREATMENT	6
Hardness - temporary hardness - permanent hardness - Municipal water treatment - disinfection methods - UV - ozonation - chlorination - desalination of brackish water - reverse osmosis - boiler troubles - scale - sludge - caustic embrittlement - treatment of boiler feed water - internal treatment - carbonate - phosphate - calgon conditioning - external treatment - demineralization process - importance and applications of AI 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 NANOCHEMISTRY	**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.



□□□□□□□□□□□ - 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					

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	Course Outcomes	Cognitive Level	Weightage of COs in ESE
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CO 2	□□□□□□□□□□□□□□□□□□□□□□□□□□□, □□□□□□□□□□, □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□.	U	20%
CO 3	□□□□□□□□□□□□□□□□□□, □□□□□□□□□□□□□□□□□, □□□□□□□□□□□□□□□□□□□□□□□□.	U	20%
CO 4	□□□□□□□□□□□□□□□□□□, □□□□□□□□□□□□□□□□□□□□□□□, □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□.	R	20%
CO 5	□□□□□□□□□□□□□□□□□□□□□□□□, □□□□□□□□□□□□□□□□□□□□□, □□□.	An	20%

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	TOTAL(L:15)

Suggested Learning Resources

Text Books – CUM- Reference Books

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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

C PROGRAMMING

(Common to AI&DS, IT, CSE, CSE(CS), CSE(IoT), ECE,EEE and BME Branches)

Course Code:	26CSC01				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
Prerequisites	Nil					

Course Objective

To provide students with a strong foundation in computational thinking and structured programming for solving engineering problems.

Course Outcomes		Cognitive Level	Weightage of COs in ESE
CO 1	Apply computational thinking principles and fundamental concepts of C programming to develop simple programs.	Ap	20%
CO 2	Implement decision-making and looping constructs in C to solve computational problems.	Ap	20%
CO 3	Apply knowledge of arrays and pointers for data storage and manipulation.	Ap	20%
CO 4	Develop modular programs using functions, recursion, and strings.	Ap	20%
CO 5	Apply the use of structures, file handling and dynamic memory allocation in C programs.	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			3							3	
CO 2	3	3			3							3	3
CO 3	3	2			3							3	3
CO 4	3	3	3		3						3	3	3
CO 5	3	3	2	2	3						3	3	3
CO (W.A)	3	2.8	2.5	2	3						3	3	3

UNIT- I : COMPUTATIONAL THINKING AND INTRODUCTION TO C PROGRAMMING	9
Computational Thinking and Problem Solving – Problem Definition and Analysis – Steps in Problem Solving – Characteristics of an Algorithm – Algorithms and Pseudo code – Flowchart Representation with Examples – Introduction to C Programming – Features and Applications of C – Structure of a C Program – Compilation and Execution Process – Types of Errors – Tokens – Character Set – Keywords – Identifiers – Data Types – Constants and Variables – Input and Output Statements – Type Conversion and Type Casting – Operators and Expressions.	
UNIT - II : DECISION CONTROL AND LOOPING STATEMENTS	**9**
Decision Making Statements – if Statement – if-else Statement – Nested if-else Statement – else-if Ladder – switch Statement – Looping Constructs: while Loop – do-while Loop – for Loop – Nested Loops – Jump Statements: break, continue and goto – Simple Programs using Control Structures.	
UNIT - III : ARRAYS AND POINTERS	**9**
Arrays – One Dimensional Arrays – Two Dimensional Arrays – Multidimensional Arrays – Array Operations and Applications – Introduction to Pointers – Pointer Declaration and Initialization – Types of Pointers – Pointer Arithmetic – Relationship between Arrays and Pointers – Array of Pointers – Pointer to Pointer.	
UNIT - IV : STRINGS AND FUNCTIONS	**9**
Strings – String Handling Functions – User Defined Functions – Function Declaration and Definition – Function Prototypes – Function Call Mechanism – Passing Arguments to Functions – Passing Arrays and Pointers to Functions – Recursive Functions – Scope and Lifetime of Variables – Storage Classes.	
UNIT - V : STRUCTURES, UNION AND FILES	**9**
Structures – Defining and Accessing Structures – Array of Structures – Nested Structures – Pointers to Structures – Unions– File Handling: Text and Binary Files – File Operations: open, read, write, append and close – Dynamic Memory Allocation using malloc(), calloc(), realloc() and free().	
	Total (L : 45)

Suggested Learning Resources

Text Books :

1. E. Balagurusamy, “Programming in ANSI C”, 9th Edition, McGraw Hill, 2024.
2. Ashok N. Kamthane and Amit Ashok Kamthane, “Programming in C”,4th Edition, Pearson Education, 2025.

Reference Books:

1. S. Sridhar, S. S. Sridhar and V. M. Hariharan, “Problem Solving and Programming in C: A Computational Thinking Approach”, 1st Edition, Pearson Education,2025.
2. Yashavant Kanetkar,” Let Us C”, 20th Edition, BPB Publications, 2025.
3. Stephen G. Kochan, “Programming in C”, 5th Edition, Pearson Education, 2024.

4. Behrouz A. Forouzan and Hamidreza Afyouni, “Computer Science: A Structured Programming Approach in C”, 4th Edition, Cengage Learning, 2023.
5. Noel Kalicharan, “Learn to Program with C: An Introduction to Programming Using the C Language”, Apress, 2022.

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 The students will be able to	Cognitive Level	Weightage of COs in ESE
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.

FUNDAMENTALS OF ELECTRICAL ENGINEERING						
Course Code:	26EEC01				CIA	40
Course Type: (Theory/Practical/Integrated)	Theory				ESE	60
L:T:P:C	2	1	0	3	Total Marks	100
Total Hours of Pedagogy	45				Exam Hours	3 Hours
Pre-requisites	Nil					

Course Objectives

- To familiarize students with the principles of electrical circuits, magnetic circuits, three-phase systems, power systems, and domestic wiring for analysis and application in electrical engineering.
- To develop the ability to analyze basic electrical circuits, power measurement techniques, identify electrical materials and wiring systems and apply electrical engineering concepts in practical applications

Course Outcomes		Cognitive Level	Weightage of COs in ESE
CO 1	Apply fundamental electrical laws and measurement techniques to analyze, measure, and evaluate electrical quantities in DC circuits.	Ap	20%
CO 2	Apply the principles of magnetic circuits to compute flux, inductance, and losses (hysteresis and eddy current) in simple and composite magnetic circuits under AC excitation, and analyze their practical applications	Ap	20%
CO 3	Analyze three-phase electrical systems, including various Load and power measurement techniques to evaluate system performance and efficiency.	An	20%
CO 4	Analyze different domestic wiring systems, electrical materials, earthing methods, and protective devices to evaluate their suitability and safety in electrical installations.	An	20%
CO 5	Analyze the basic structure of power systems and evaluate the operating voltage levels used in generation, transmission, and distribution.	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		1	1								
CO 2	3	2		2									
CO 3	2	3		2								2	

CO 4	2	3		2								2	
CO 5	2	3		2									
CO (W.A)	3	3		2	1							2	

Unit- I : BASICS OF ELECTRIC CIRCUIT ANALYSIS	**(9)**
Ohm's Law - Kirchhoff's Current Law and Kirchhoff's Voltage Law - Resistors in Series and Parallel - Voltage and Current Division rule - Nodal analysis & Mesh analysis - Delta-Wye Conversion	
Unit- II : MAGNETIC CIRCUITS	**(9)**
Introduction to Magnetic Circuits: Types- Flux Linkage-Inductance-fringing-Properties of Magnetic materials: AC excitation, Hysteresis and Eddy Current losses. Magnetic Coupled Circuits -Analysis of simple and composite magnetic circuits-Simple Problems -Applications of Magnetic circuits –Resonance.	
Unit- III : THREE PHASE CIRCUITS AND POWER MEASUREMENTS	**(9)**
Three phase voltages and currents-Phase sequence-Line and phase quantities- Phasor diagrams-Balanced and unbalanced loads- Analysis of three phase 3-wire, 4-wire circuits with star and delta connected loads– Power and power factor measurements using two wattmeter method	
Unit- IV : DOMESTIC WIRING	**(9)**
Types of Domestic wiring: Cleat, Wooden,PVC, Toughened Rubber Sheath and Conduit wiring- Specifications of Wires-Types of Cables-Earthing system-Fuses and HRC fuses- Conductor and Insulating Materials- Classification and Properties.	
Unit- V : BASICS OF POWER SYSTEMS	**(9)**
Introduction- Generation: Hydro, Thermal, Atomic, Wind and Solar power system (Qualitative Analysis)- Types of Distribution Systems-Single line diagram-Layout of 33KV/11KV Substation.	
	Total (L : 45)

Suggested Learning Resources

Text Books :

1.Jr., William H. Hayt, Kemmerly, Jack E.Phillips, Jamie D.Durbin, Steven M. "Engineering Circuits Analysis",10th edition., Tata McGraw Hill publishers, 2024.

2. Ritu Sahdev "Basic Electrical Engineering"1st Revised Edition, Khanna Book Publishing Co,2024

Reference Books:

1.R Muthusubramanian and S Salivahanan, "Basic Electrical and Electronics Engineering , Education" ,2nd Edition, McGraw Hill, 2024

2.V K Mehta , Rohit Mehta"Principles of Power System" S Chand And Company Ltd, Revised Edition, 2022

3. Sudhakar A and Shyam Mohan S Pall, "Circuits and Network Analysis and Synthesis", McGraw Hill Education

India pvt.ltd New Delhi,6th edition 2025.

4. D P Kothari and I.J Nagarath, "Basic Electrical and Electronics Engineering", McGraw Hill Education (India) Private Limited, 2nd Edition, 2020

5.Mathew N. O. Sadiku, S.V. Kulkarni 'Principles of Electromagnetics', 6th Edition, Oxford University Press Inc. Asian edition, 2015

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 Level	Weightage of 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 The students will be able to	Cognitive Level	Weightage of COs in ESE
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 (CO_2 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

C PROGRAMMING LABORATORY

(Common to AI&DS, IT, CSE, CSE(CS), CSE(IoT), ECE,EEE and BME Branches)

Course Code:	26CSP01				CIA	60
Course Type: (Theory/Practical/Integrated)	Practical				ESE	40
L:T:P:C	0	0	3	1.5	Total Marks	100
Total Hours of Pedagogy	45				Exam Hours	3
Prerequisites	Nil					

Course Objective

To develop programming skills in C by implementing programs based on fundamental concepts and constructs of the language.

Course Outcomes		Cognitive Level	Weightage of COs in ESE
CO 1	Develop simple C programs using basic programming constructs, input/output statements, operators, and type conversion.	Ap	20%
CO 2	Implement decision-making and looping constructs to solve computational problems effectively.	Ap	20%
CO 3	Apply arrays and pointers for efficient data storage and memory manipulation.	Ap	20%
CO 4	Develop modular C programs using string handling techniques and functions, recursion.	Ap	20%
CO 5	Apply structures, unions, file handling and dynamic memory allocation to solve real-world problems.	Ap	20%

Mapping of COswith 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			3							3	3
CO 3	3	2			3							3	3
CO 4	3	3	3		3					3		3	3
CO 5	3	3	3		3					3		3	3
CO (W.A)	3	2.8	3		3					3		3	3

List of Experiments:

1. Programs to perform formatted input/output operations, arithmetic operations, operators, expressions and type conversion.
2. Programs to demonstrate the usage of decision-making statements.
3. Programs to demonstrate the various looping statements.
4. Programs to perform operations using one-dimensional and two-dimensional arrays.
5. Programs to demonstrate pointer operations and array manipulation using pointers.
6. Program to perform string operations.
7. Programs to demonstrate user-defined functions, parameter passing, and recursion.
8. Programs to demonstrate the use of structures and unions.
9. Programs for reading and writing data in text and binary files.
10. Programs to demonstrate dynamic memory allocation.

Total (P : 45)

Hardware / Software

Hardware Requirements
Computer/Desktop with 4 GB RAM or above
Intel Core i3 Processor or equivalent

Software Requirements
C Compiler (GCC / Turbo C or equivalent)
Operating System: Windows/Linux

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 The students will be able to		Cognitive Level	Weightage of COs in ESE
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	

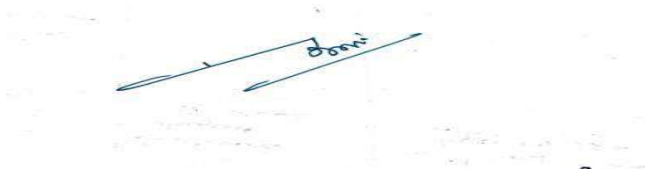
Mapping of COs with POs / PSOs

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 – Serminal Fluid – Life Force – Biomagnetism – Mind, Maintaining Youthfulness – Postponing Aging – Transformation of food into Seven Body Constitutes Greatness of Serminal 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



APPLIED TRANSFORM TECHNIQUES AND COMPLEX FUNCTIONS						
Course Code:	26MYB07				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 develop proficiency in Fourier series, Fourier transforms, and Z-transforms for analyzing signals, discrete-time systems, and solving difference equations.
2. To develop analytical skills in complex functions, conformal mappings, and contour integration for solving engineering and communication system problems.

Course Outcomes		Cognitive Level	Weightage of COs in ESE
CO 1	Apply Fourier series to represent periodic functions and analyze harmonic components in engineering applications.	Ap	20%
CO 2	Use Fourier transforms to solve problems related to signal processing, frequency analysis, and communication systems.	Ap	20%
CO 3	Apply Z-transform techniques to analyze discrete-time systems and solve difference equations.	Ap	20%
CO 4	Analyze analytic functions, harmonic functions, and conformal mappings in complex analysis and engineering applications.	An	20%
CO 5	Evaluate contour integrals using Cauchy's theorem, residue theorem, and apply them in signal, circuit, and network analysis.	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 : Fourier Series	**(9+3)**
Dirichlet's conditions – General Fourier series – Odd and even functions – Half-range Sine and Cosine series – Parseval's identity – Harmonic Analysis.	
Unit- II : Fourier Transform	**(9+3)**

Fourier integral theorem – Fourier transform pair - Fourier sine and cosine transforms – Properties – Transform of elementary functions - Convolution theorem (without proof) – Parseval's identity.	
Unit- III : Z – Transform	**(9+3)**
Z-transform – Elementary Properties – Inverse Z-transform – Convolution theorem – Initial and final value theorems – Difference Equations using Z-transform.	
Unit- IV : Complex differentiation	**(9+3)**
Analytic functions–Necessary and sufficient conditions for analyticity in Cartesian and polar coordinates-Properties–Harmonic conjugates–Construction of analytic function–Conformal mapping – Mapping by functions w = z+c, cz, c/z, Bilinear transformation.	
Unit- V : Complex Integration	**(9+3)**
Cauchy's integral theorem–Cauchy's integral formula–Taylor's and Laurent's series –Singularities–Residues–Cauchy Residue theorem–Evaluation of contour integration over unit circle and semi circle.	
	Total (L:45+T:15)

Suggested Learning Resources

Text Books :

1. P. Kandasamy, K. Thilagavathy and K. Gunavathi, Transforms and Partial Differential Equations, 3rd Edition, S. Chand & Company Ltd., New Delhi, 2013.
2. James Ward Brown and Ruel V. Churchill, Complex Variables and Applications, 9th Edition, McGraw Hill Education, New York, 2014.

Reference Books:

1. B. S. Grewal, Higher Engineering Mathematics, 45th Edition, Khanna Publishers, New Delhi, 2023.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 11th Edition, Wiley India Pvt. Ltd., New Delhi, 2025.
3. A. K. Jain, S. R. K. Iyengar and R. K. Jain, Fourier Series and Integral Transforms 1st Edition, Narosa Publishing House, New Delhi, 2009.
4. Lars V. Ahlfors, Complex Analysis, 3rd Edition, McGraw Hill Education, (AMS Chelsea Publishing),2021.
5. James Ward Brown and Ruel V. Churchill, Complex Variables and Applications, McGraw-Hill Education, 2014.

APPLIED PHYSICS FOR ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to ECE & EEE Branches)

Course Code:	26PYB06				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 students with a fundamental understanding of crystal structures, semiconductor physics, optical fiber communication, oscillations, wave phenomena, and quantum computing.
2. To develop the ability to apply physics principles for analyzing engineering materials, electronic devices, communication systems, and emerging quantum technologies.

Course Outcomes		**Cognitive Level**	**Weightage of COs in ESE**
CO1	Determine the crystal structure parameters and differentiate crystal growth techniques for advanced materials.	Ap	20%
CO2	Demonstrate semiconductor physics to explain the characteristics and applications of semiconductor devices in modern electronic systems.	Ap	20%
CO3	Analyze the propagation characteristics of optical fibers and evaluate the performance of fiber optic communication systems and sensors.	An	20%
CO4	Examine the behavior of oscillatory systems, mechanical waves, ultrasonic waves, and electromagnetic waves in engineering applications.	An	20%
CO5	Implement the concepts of qubits and quantum gates in quantum information processing and compare the performance of quantum and classical computing systems.	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											
CO 2	3	3					1						
CO 3	3	2											
CO 4	3	2											
CO 5	3	2				1	1						
CO (W.A)	3	2				1	1						

Unit- I : Crystal Structure and Growth Techniques	**9**
Crystal structure - Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – d spacing in cubic lattice – Calculation of number of atoms per unit cell – Atomic radius – Coordination number – Packing factor for SC, BCC and HCP structures - Crystal growth techniques –solution, melt (Bridgman and Czochralski) and vapour growth techniques (qualitative)	
Unit- II :Semiconductor Physics and Devices	**9**

Energy band theory – Fermi level and carrier concentration – Intrinsic semiconductors and extrinsic semiconductors (qualitative)– Hall effect and applications – PN junction diode and transistor – LED - photodiode – solar cell – Semiconductor applications in communication and power systems.	
Unit- III :Fiber Optics and Communication Systems	**9**
Principle of optical fiber communication – Acceptance angle and numerical aperture – Types of optical fibers – Propagation mechanisms in optical fibers – Attenuation and dispersion – Fiber optic cables and connectors – Temperature and pressure sensors.	
Unit- IV :Oscillations and Wave Phenomena	**9**
Oscillations: Simple Harmonic motion, Torsional pendulum, Couple per unit twist, Damped and Forced Oscillation **Waves:** Waves on a stretched string, Energy and Power, standing waves, Ultrasonics, piezo-electric method, Acoustic grating. **Electromagnetic waves:** Maxwell equation, Production of EM waves by dipole antenna, Propagation of EM waves in free space, wave equation, Cell phone reception	
Unit- V :Quantum Computing	**9**
Quantum system for information processing - quantum states – classical bits – quantum bits or qubits – Bloch sphere – CNOT gate – Single and multiple qubits – quantum gates (Pauli – X, Y and Z Gates, Hadamard Gate) – Advantage of quantum computing over classical computing.	
	Total (L : 45)

Suggested Learning Resources

Text Books :

1. Bhattacharya, D.K. & Poonam (2015), T. “Engineering Physics”. Oxford University Press.
2. Bernhardt, C. (2019). Quantum computing for everyone. MIT Press.

Reference Books:

1. Young, H. D., & Freedman, R. A. (2020). University physics with modern physics. Pearson.
2. Neamen, D. A. (2021). Semiconductor Physics and Devices: Basic Principles (4th ed.). McGraw-Hill Education.
3. Bhattacharya, D. K., &Tandon, P. (2015). Engineering Physics, Oxford University Press.
4. Griffiths, D. J. (2018). Introduction to quantum mechanics. Cambridge University Press.
5. V.K.Mehta &Rohit Mehta (2022), Principles of Electronics, S.Chand Publishing.

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
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 COswith 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

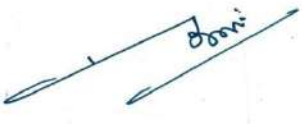
Text Books :

1. Dr. A.Ravikrishan, Envrionmental Science and Engineering, Sri Krishna Hitech Publishing Co. Pvt.Ltd., Chennai,15th Edition, 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.



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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					
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Course Outcomes		Cognitive Level	Weightage of COs in ESE
CO 1	□□□□□□□□□□□□, □□□□□□□□□, □□□□□□□□□□□, □□ □□□□□□□□.	An	20%
CO 2	□□□□□, □□□□□□□, □□□□□□□□□□□□□□□□□□□□□□, □□□.	U	20%
CO 3	□□□□□□□□□□□□□□□□□, □□□□□□□□□□□□□□□□, □□.	U	20%
CO 4	□□□□□□□□□□□□□□, □□□□□□□□□□□□□□, □□□□□□□□□□□□□□□□□□□□.	R	20%
CO 5	□□ □□□□□□□□□□□□□□□□□.	U	20%

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TOTAL(L:15)	

Suggested Learning Resources
Text Books – CUM- Reference Books

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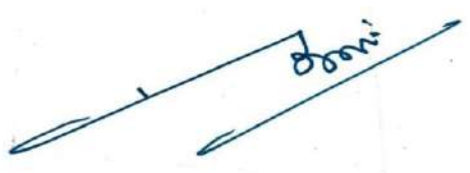
5. Dr.K.K.Pillay - Social life of Tamils, A join publication of TNTB & ESC and RMRL - (in print)
6. Dr.K.K.Pillay - Studies in the History of India with special reference to Tamil Nadu.(Published by: The Author)
7. Keeladi – 'Sangam City Civilization on the Banks of River Vaigai' (Jointly published by : Departmental Archaelogy& 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.



DATA STRUCTURES

(Common to AI&DS, IT, CSE, CSE(CS), CSE(IoT), ECE,EEE and BME Branches)

Course Code:	26CSC02				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
Prerequisites	Nil					

Course Objective

To provide knowledge of linear and non-linear data structures and their applications in problem solving.

Course Outcomes		Cognitive Level	Weightage of COs in ESE
CO 1	Apply the concepts of Abstract Data Types (ADT) and implement linear data structures for solving computational problems.	Ap	20%
CO 2	Implement linear data structures such as linked lists, stacks, queues, and hashing techniques.	Ap	20%
CO 3	Apply tree-based data structures and heap operations to solve computational problems.	Ap	20%
CO 4	Apply trie structures and hashing techniques for efficient data storage and retrieval.	Ap	20%
CO 5	Apply graph traversal algorithms and their applications to solve computational problems.	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								2	3	2
CO 2	3	3	2		2						2	3	3
CO 3	3	3	3	2	2						2	3	3
CO 4	2	3	3	2	3						2	2	3
CO 5	3	3	3	2	3						3	3	3
CO (W.A)	2.8	2.8	2.6	2	2.5						2.2	2.8	2.8

Unit- I : FOUNDATIONS OF DATA STRUCTURES AND LINEAR LISTS	**9**

Abstract Data Types (ADT) - Basic concept of Data Structures - Array-based implementation - Linked list implementation - Singly, Doubly, Circular linked lists - Applications of lists - Polynomial ADT.	
Unit- II :STACKS AND QUEUES	**9**
Stack ADT – Operations and Applications – Balancing Symbols – Expression Evaluation – Infix to Postfix Conversion – Function Calls and Recursion – Queue ADT – Array-based Queue – Linked Queue – Circular Queue – Double-ended Queue (Deque).	
Unit- III :TREES	**9**
Tree ADT – Tree Traversals - Binary Tree ADT – Expression trees – Binary Search Tree ADT – AVL Trees – Priority Queue (Heaps) – Binary Heap.	
Unit- IV : TRIES AND HASHING	**9**
Tries: Standard Tries, Compressed Tries, Binary Tries– Introduction to Hashing – Hash Functions – Collision Resolution Techniques: Separate Chaining and Open Addressing – Applications of Hashing.	
Unit- V : GRAPHS	**9**
Definitions – Representation of Graphs – Types of Graph – Graph Traversal: Depth-First Search (DFS) – Breadth-First Search (BFS) – Topological Sort – Applications of DFS: Bi-connectivity – Euler Circuits – Finding Strongly Connected Components – Applications of BFS: Bipartite Graph.	
	Total(L : 45)

Suggested Learning Resources

Text Books :

1. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, Pearson Education, 2014.
2. Gilberg, R. F., &Forouzan, B. A, “Data Structures: A Pseudocode Approach”, Cengage Learning India Private Limited, 2023.
3. Ellis Horowitz and Sartaj Sahni, “Fundamentals of Data Structures”, Universities Press, 2014.

Reference Books:

1. Thomas H. Cormen et al.,” Introduction to Algorithms”, MIT Press, 2022.
2. Robert Lafore, “Data Structures and Algorithms in Java”, Sams Publishing, 2017.
3. Michael T. Goodrich et al., “Data Structures and Algorithms in Python”, Wiley India, 2016.
4. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, “Data Structures and Algorithms”, Pearson, 2001.
5. D.S. Malik, Data Structures Using C++, 2nd Edition, Cengage, 2012.

CIRCUIT THOERY AND NETWORK ANALYSIS						
Course Code:	26EEC05				CIE	
Course Type: (Theory/Practical/Integrated)	Integrated				ESE	100
L:T:P:C	45	0	30	3	Total Marks	100
Total Hours of Pedagogy	75 (L : 45 + P : 30)				Exam Hours	03:00
Pre-requisites	Basics of Electrical and Electronics Engineering					

Course Objectives

- To understand the fundamental principles of electrical circuits using graph theory.
- To apply network theorems and circuit analysis techniques to evaluate the performance of DC and AC circuits.
- To analyze the transient responses of DC circuits and characterize electrical networks using two-port parameters.

Course Outcomes		Cognitive Level	Weightage of COs in ESE
CO 1	Apply basic techniques to frame the topology of electrical networks.	Ap	20%
CO 2	Apply network theorems to simplify and analyze DC & AC electrical circuits.	Ap	20%
CO 3	Analyze the steady state and transient behavior of RL, RC, RLC circuits using Laplace transform.	An	20%
CO 4	Analyze the two port network parameters in terms of characterization.	An	20%
CO 5	Analyze the two port network parameters in terms of correlation.	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	2	2	2							2	
CO 2	2	2	2		1							2	
CO 3	2	2	2		1							2	
CO 4	2	2	1	1	2							1	
CO 5	2	2	1	1	2							1	
CO (W.A)	2.2	2.2	1.6	1.3	1.6							1.6	

Unit- I : GRAPH THEORY	**9**
Introduction to Cut-sets: Cut-Set Vectors - Matrices Cut-Set, Planar Graph and Non-Planar Graph - Problems	

Unit- II : NETWORK THEOREMS	**9**
DC Circuits: Thevenin's theorem - Norton's theorem - Superposition theorem - Maximum Power Transfer theorem - Reciprocity theorem, AC Circuits: Thevenin's theorem	
Unit- III : STEADY STATE AND TRANSIENT RESPONSE	**9**
Sinusoidal steady state & Transient response of RL, RC and RLC Circuits using Laplace transform for AC & DC input	
Unit- IV : TWO PORT NETWORKS	**9**
Driving point and transfer function of two port networks in terms of Z, Y, h and ABCD parameters – Problems	
Unit- V : CORRELATION & INTERCONNECTION OF TWO PORT NETWORKS	**9**
Introduction to Correlation: Z in terms of Y, h and ABCD parameters, Interconnection: Series Connection – Parallel Connection - Cascaded Connection	

List of Experiments:	**30 Hours**
1. Experimental verification of Ohm's law, Kirchhoff's voltage and current laws 2. Experimental verification of Superposition theorem 3. Experimental verification of Thevenin's theorem 4. Experimental verification of Norton's theorem 5. Verification of KVL and KCL by using digital simulation 6. RLC series resonance circuits by using digital simulation 7. Determination of different parameters of two-port network to obtain the values of Z_{11} and Z_{21} 8. Determination of different parameters of two-port network to obtain the values of Z_{12} and Z_{22} 9. Verification of Interrelations of two-port network: Z parameter in terms of y parameter 10. Verification of Interrelations of two-port network: Z parameter in terms of h parameter https://asnm-iitkgp.vlabs.ac.in/exp/two-port-network/simulation.html	
	Total (L : 45 + P : 30)

Suggested Learning Resources
Text Books : 1. Charles K. Alexander, Matthew N. O. Sadiku, "Fundamentals of Electric Circuits", 7th ed, McGraw-hill Education India pvt.ltd, New Delhi, 2022. 2. Sudhakar A and Shyam Mohan S Pall, "Circuits and Network: Analysis and Synthesis", 6th ed, McGraw Hill Education India pvt.ltd, New Delhi, 2025.
Reference Books:
1. William H. Hayt Jr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis," 10th ed., Tata McGraw Hill publishers, New Delhi, 2024. 2. S.R. Paranjothi, "Electric Circuits Analysis", New Age International Ltd., New Delhi, 4th Edition, 2014. 3. L Robert Boylested, Introductory Circuit Analysis", 13th Edition, PHI Learning Private Limited, 2016. 4. Van Valkenburg M.E., "Network Analysis", Pearson Education India, Revised 3rd Edition, 2019. 5. Steven T. Karris, Circuit Analysis I with MATLAB Applications, Orchard Publications, 2004.

G.R

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**
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

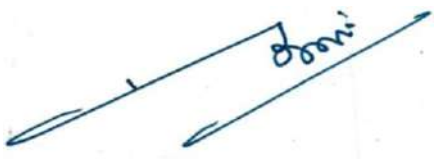
COs	**POs**											**PSOs**	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	3	2		1									
CO 2	3	3											
CO 3	3	3	1	1									
CO 4	3	2											
CO 5	3	2											
CO	3	2	1	1									

(W.A)													

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)



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
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 :

3. Sanjay Kumar and PushpLata, "Communication Skills", Oxford University Press, Third Edition, 2023.
4. Meenakshi Raman and Sangeeta Sharma, "Professional Communication", Oxford University Press, Third Edition, 2022.

Reference Books:

1. Barun K. Mitra, "Personality Development and Soft Skills", Oxford University Press, Second Edition, 2023.
2. Flatley, Marie E. and Rentz, Kathryn. “Business Communication: Connecting in a Digital World”, McGraw Hill Education, 2022.
3. Murphy, Herta A., Hildebrandt, Herbert W. and Thomas, Jane P. “Effective Business Communication”, McGraw Hill Education, 2022.
4. Raman, Meenakshi and Sharma, Sangeeta. “Technical Communication: Principles and Practice”, Oxford University Press, 2021.
5. D. Sudha Rani, "English for Professional Communication", Pearson Education, Second Edition, 2021.

DATA STRUCTURES LABORATORY *(Common to AI&DS, IT, CSE, CSE(CS), CSE(IoT), ECE, EEE and BME Branches)*							
Course Code:	26CSP02				CIA	60	
Course Type: (Theory/Practical/Integrated)	Practical				ESE	40	
L:T:P:C	0	0	3	1.5	Total Marks	100	
Total Hours of Pedagogy	45				Exam Hours	3	
Pre-requisites	Programming Skills						
Course Objective							
To develop skills in implementing and applying linear and non-linear data structures for efficient problem-solving.							

Course Outcomes		Cognitive Level	Weightage of COs in ESE
CO 1	Apply List ADT and linked list concepts to perform basic operations.	Ap	20
CO 2	Implement stack and queue operations to solve computational problems.	Ap	20
CO 3	Demonstrate binary tree, BST, and AVL tree operations and traversals.	Ap	20
CO 4	Analyze hash functions and priority queue operations for efficient data handling.	An	20
CO 5	Analyze graph traversal techniques to solve computational problems.	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			3							3	2
CO 2	3	3	2		3							3	3
CO 3	3	3	2		3							3	3
CO 4	2	3	2		3						2	3	3
CO 5	2	3	2		3						2	3	3
CO (W.A)	2.6	2.8	2		3						2	3	2.8

List of Experiments:

1. Implementation of List ADT using arrays and linked lists.
2. Implementation of Singly, Doubly, and Circular Linked Lists and their operations.
3. Implementation of Stack ADT and its applications.
4. Implementation of Queue ADT using arrays and linked lists.
5. Implementation of Circular Queue and Double-ended Queue (Deque).
6. Implementation of Binary Trees and its Tree Traversals.
7. Implementation of Binary Search Tree (BST) and AVL Tree operations.
8. Implementation of Priority Queue.
9. Implementation of Hash functions and Hashing operations.
10. Implementation of Graph representation and Graph Traversals (BFS and DFS).

Total (P : 45)

Hardware / Software

Hardware Requirements
Computer/Desktop with 4 GB RAM or above
Intel Core i3 Processor or equivalent

Software Requirements
C Compiler (GCC / Turbo C or equivalent) / Python IDLE

ANALYTICAL SKILLS – I *(Common to All Branches)*						
Course Code:	26GEA01				CIA	100
Course Type: (Theory/Practical/Integrated)	Theory				ESE	-
L:T:P:C	2	0	0	1	Total Marks	100
Total Hours of Pedagogy	30				Exam Hours	2.5
Prerequisite	Nil					

Course Objectives

1. To develop students' proficiency in quantitative aptitude by strengthening their understanding of number systems, arithmetic concepts, mathematical applications, and problem-solving techniques required for academic, competitive, and placement examinations.
2. To enhance students' logical reasoning and analytical thinking skills by enabling them to identify patterns, solve reasoning problems, analyze relationships, and apply spatial visualization techniques for effective decision-making and logical problem-solving.

Course Outcomes The students will be able to		Cognitive Level	Weightage of COs in CIA
CO 1	Understand and apply fundamental number theory techniques to solve quantitative aptitude efficiently.	U	20%
CO 2	Solve basic mathematical and word problems accurately and efficiently.	AP	20%
CO 3	Analyze and solve real-life and aptitude-based arithmetic problems effectively.	Ap	20%
CO 4	Develop logical thinking and analytical reasoning skills for solving reasoning problems effectively.	An	20%
CO 5	Apply analytical and spatial reasoning skills and solve analogy and image-based reasoning problems effectively.	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	2											
CO 2	2	2											
CO 3		2	2										
CO 4		2									2		
CO 5		2									2		
CO (W.A)	2	2	2								2		

Unit- I : Number Theory and Divisibility Rules	**6**
Place and Face Value – Types of Numbers – Divisibility Rule – Unit Digit Concept – Remainder Theorem - Problems on HCF and LCM - Arithmetic Progression - Geometric Progression.	
Unit- II : Basic Arithmetic and Word Problems	**6**
BODMAS – Simplification – Problems on Numbers – Math Puzzle.	
Unit- III : Fundamentals of Arithmetic Applications	**6**
Percentage - Ratio and Proportion – Ages – Average.	
Unit- IV : Pattern Analysis and Logical Thinking	**6**
Number series - Alphabetical Series – Alphanumeric – Odd man out - Coding and Decoding.	
Unit- V : Analogy and Spatial Visualization	**6**
Analogy – Mirror Images –Water Images – Pattern Completion.	
	Total (P : 30)

Suggested Learning Resources

Reference Books:

1. Aggarwal R S. “Quantitative Aptitude for Competitive Examinations”, S. Chand Publishing Company Ltd(s)., 2022.
2. Sharma, Arun. “How to Prepare for Quantitative Aptitude for the CAT”, Tata McGraw – Hill Publishing, 2024.
3. Dr. R. S. Aggarwal. “A Modern Approach to Logical Reasoning”, S. Chand Publishing., 2024–2025 (revised editions used for competitive exams).

Web links and Video Lectures (e-Resources):

1. https://www.geeksforgeeks.org/aptitude/quantitative-aptitude/
2. https://aspirantzone.in/study-materials/subject-wise-study-materials/quantitative-aptitude-study-material-practice/
3. https://www.testmocks.com/blog/quantitative-aptitude-mock-test/
4. https://letsstudytogether.co/quantitative-aptitude-topic-wise-questions-and-answers-pdf-download/