SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

REGULATIONS 2024

CHOICE-BASED CREDIT SYSTEM

B. E. ELECTRICAL AND ELECTRONICS ENGINEERING

Vision

To mould Electrical and Electronics Engineers with competent knowledge, and skills to solve real time problems in industry and society.

Mission

- To facilitate students to adept latest technology in addressing the challenges in transmission and distribution of electricity.
- To engage and collaborate with industry to build unified technology.
- To kindle the students to innovate in designing and developing new products to solve real time problems in society and industry.
- To inculcate the need of green energy in the minds of students to sustain Mother Nature.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

Bachelor of Electrical and Electronics Engineering curriculum is designed to impart Knowledge, Skill and Attitude on the graduates to

PEO1:	Have successful technical and professional careers in their chosen fields such as circuit theory, Field theory, control theory and computational platforms.
PEO2:	Engross in life long process of learning to keep themselves abreast of new developments in the field of Electrical and their applications in power engineering.
PEO3:	Design, simulate, analyze and develop Electrical and Electronics Engineering based products which are reliable, cost effective and safe.

PROGRAM OUTCOMES (POs)

Students graduating from Electrical and Electronics Engineering shall be able to:

PO1 Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization for the solution of complex engineering problems.

PO2 Problem analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development.

PO3 Design/ development of solutions: 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.

PO4 Conduct investigations of complex problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions.

PO5 Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems.

PO6 The Engineer and the World: 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.

PO7 Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to National & International laws.

PO8 Individual and Collaborative Team Work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9 Communication: 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.

PO10 Project management and finance: 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.

PO11 Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Capable to provide socially acceptable technical solutions to complex electrical engineering problems with the application of modern and appropriate techniques for sustainable development.

PSO2: Comprehend, analyses and design products in core domains namely power, control and energy to meet the ever-changing demands of industry and society.

PEO / PO MAPPING:

PEOs	PO's											PSOs	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**1**	**2**
1	3	3	3	3	3	3	3	3	3	3	3	3	3
2	3	2	2	1	3	3		3		3	3	3	3
3	3	3	3	3	3	3		3		3	3	3	3

Mapping of Course Outcome and Programme Outcome

Year	Semester	Semester	Course name	PO's											PSOs	
				1	2	3	4	5	6	7	8	9	10	11	1	2
I	I	24IP3151	Induction Program													
		24HS3151	Functional English	2	2	2	2	2	3	3	2	3	3	3		
		24MA3151	Matrices and Calculus	3	3	1	1				2		2	3		
		24GE3151	Programming in C	2	2	2	1	2	1	1	1	2		3	3	2
		24BE3155	Basic Civil and Mechanical Engineering	2					1	2	1	2		2		
		24GE3152	Heritage of Tamil													
		24CY3051	Engineering Chemistry	3	1	1	1		2		1			1		
		24GE3171	Programming in C Laboratory	2	2	3	2	1	2			3	1	3	3	3
		24GE3071	Engineering Practices Laboratory	3	2	2		2					1	2	2	
		24ES3151	Basic Computing Skills for Engineers	2.5	2	2	2	3	2						3	2
		24GE3172	Soft Skills - I													
I	II	24HS3252	Professional English	2	2	2	2	2	3	3	2	3	3	3		
		24MA3251	Statistics and Numerical Methods	3	3	1	1				2		2	3		
		24GE3052	Problem Solving and Python Programming	2	3	3	3	2					2	2	3	3
		24GE3051	Engineering Graphics	3	2	2	1	1						2	1	3
		24EE3251	Circuit Theory	3	3	3	3	2	2	1				3	3	3
		24GE3252	Tamils and Technology													
		24PH3051	Engineering Physics	3	1	2										
		24EE3271	Electric Circuits Laboratory	3	3	3	3	3	2	2	3			3	3	3
		24GE3072	Problem Solving and Python Programming Laboratory	2	3	3	3	2					2	2	3	3
		24GE3272	Soft skills – II													

II	**III**	24MA3303	Probability and Complex Functions	3	3						2			2		
		24EE3301	Electromagnetic Theory	3	2	1	2			1	1	2			1	3
		24EE3302	DC Machines and Transformers	3	3	1	1	1			1				1	3
		24EE3303	Measurements and Instrumentation	3	2	3	2	3		2		3		3	3	3
		24EE3304	Electron Devices and Circuits	2	2	3	2	2			1				1	3
		24CS3303	Data Structures using C	2	2	1	2	2						1	1	1
		24EE3311	DC Machines and Transformers Laboratory	3	3	1	1				1				3	3
		24EE3372	Electrical Safety													
II	**IV**	24GE3451	Environmental Scienc and Sustainability	2	2	2	2	2	2	1	2	1	1	2	2	1
		24EE3401	Transmission and Distribution	3	2	1	1		1	2	2	1	1	2	3	3
		24EE3402	Induction and Synchronous Machines	2	3	3	3	2			2	2	1	1	3	2
		24EE3403	Control Systems	3	3	3	3	3		1				3	3	3
		24EE3404	Linear and Digital Logic Circuits	3	3	3	1	3		1				1	3	3
		24CS3402	Object Oriented Programming	2	1	2	2	2			2	2	1	2	3	2
		24EE3411	Induction and Synchronous Machines Laboratory	3	3	3	3	3				1			3	3
		24EE3412	Control and Instrumentation Laboratory	3	3	3	3	3		2				2	3	3
		24EE3472	PCB Design and Fabrication													

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

REGULATIONS 2024

CHOICE-BASED CREDIT SYSTEM

B. E. ELECTRICAL AND ELECTRONICS ENGINEERING

CURRICULUM AND SYLLABI FOR I TO VIII SEMESTERS

SEMESTER – I

S. No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
MANDATORY NON CREDIT COURSE								
1	24IP3151	Induction Program	MNC	Two Weeks				0
THEORY COURSES								
2	24HS3151	Functional English	HSMC	2	0	0	2	2
3	24MA3151	Matrices and Calculus	BSC	3	1	0	4	4
4	24GE3151	Programming in C	ESC	3	0	0	3	3
5	24BE3155	Basic Civil and Mechanical Engineering	ESC	3	0	0	3	3
6	24GE3152	Heritage of Tamil	HSMC	1	0	0	1	1
THEORY COURSE WITH LABORATORY COMPONENT								
7	24CY3051	Engineering Chemistry	BSC	3	0	2	5	4
LABORATORY COURSES								
8	24GE3171	Programming in C Laboratory	ESC	0	0	4	4	2
9	24GE3071	Engineering Practices Laboratory	ESC	0	0	4	4	2
PROFESSIONAL DEVELOPMENT COURSES								
10	24ES3151	Basic Computing Skills for Engineers	EEC	0	0	2	2	1
11	24GE3172	Soft Skills - 1	EEC	0	0	2	2	1
			TOTAL	**15**	**1**	**14**	**30**	**23**

SEMESTER – II

S. No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK		CREDITS

				L	T	P	TOTAL CONTACT PERIODS	
THEORY COURSES								
1	24HS3252	Professional English	HSMC	2	0	0	2	2
2	24MA3251	Statistics and Numerical Methods	BSC	3	1	0	4	4
3	24GE3052	Problem Solving and Python Programming	ESC	3	0	0	3	3
4	24GE3051	Engineering Graphics	ESC	2	2	0	4	4
5	24EE3251	Circuit Theory	PCC	3	0	0	3	3
6	24GE3252	Tamils and Technology	HSMC	1	0	0	1	1
7		NCC Credit Course Level 1#	-	2	0	0	2	2#
THEORY COURSE WITH LABORATORY COMPONENT								
8	24PH3051	Engineering Physics	BSC	3	0	2	5	4
LABORATORY COURSES								
9	24EE3271	Electric Circuits Laboratory	PCC	0	0	4	4	2
10	24GE3072	Problem Solving and Python Programming Laboratory	ESC	0	0	4	4	2
PROFESSIONAL DEVELOPMENT COURSE								
11	24GE3272	Soft skills – II	EEC	0	0	2	2	1
			TOTAL	**19**	**3**	**12**	**34**	**26**

 # NCC Credit Course level 1 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

SEMESTER III

S. No.	COURSE CODE	COURSE TITLE	CATEORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY COURSES								
1	24MA3303	Probability and Complex Functions	BSC	3	1	0	4	4
2	24EE3301	Electromagnetic Theory	PCC	3	1	0	4	4
3	24EE3302	DC Machines and Transformers	PCC	3	0	0	3	3
4	24EE3303	Measurements and Instrumentation	PCC	3	0	0	3	3
THEORY COURSES WITH LABORATORY COMPONENT								
5	24EE3304	Electron Devices and Circuits	PCC	3	0	2	5	4
6	24CS3303	Data Structures Using C	ESC	3	0	2	5	4
LABORATORY COURSE								
7	24EE3311	DC Machines and Transformers Laboratory	PCC	0	0	3	3	1.5
PROFESSIONAL DEVELOPMENT COURSE								
8	24EE3372	Electrical Safety	EEC	0	0	2	2	1
			TOTAL	**18**	**2**	**9**	**29**	**24.5**

SEMESTER IV

S. No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY COURSES								

1	24GE3451	Environmental Science and Sustainability	BSC	2	0	0	2	2
2	24EE3401	Transmission and Distribution	PCC	3	0	0	3	3
3	24EE3402	Induction and Synchronous Machines	PCC	3	0	0	3	3
4	24EE3403	Control Systems	PCC	3	1	0	4	4
5		NCC Credit Course Level 2#	-	3	0	0	3	3#
THEORY COURSES WITH LABORATORY COMPONENT								
6	24EE3404	Linear and Digital Logic Circuits	PCC	3	0	2	5	4
7	24CS3402	Object Oriented Programming	ESC	3	0	2	4	4
LABORATORY COURSES								
8	24EE3411	Induction and Synchronous Machines Laboratory	PCC	0	0	3	3	1.5
9	24EE3412	Control and Instrumentation Laboratory	PCC	0	0	3	3	1.5
PROFESSIONAL DEVELOPMENT COURSE								
10	24EE3472	PCB Design and Fabrication	EEC	0	0	2	2	1
			TOTAL	**20**	**1**	**12**	**32**	**24**

 # NCC Credit Course level 2 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

SEMESTER V

S. No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY COURSES								
1	24EE3501	Power System Analysis	PCC	3	0	0	3	3
2	24EE3502	Power Electronics	PCC	3	0	0	3	3
3	24EE3503	Microprocessor and Microcontroller	PCC	3	0	0	3	3
4		Professional Elective-I	PEC	3	0	0	3	3
5		Professional Elective-II	PEC	3	0	0	3	3
6		Mandatory Course I&	MC	3	0	0	3	-
THEORY COURSE WITH LABORATORY COMPONENT								
7	24EE3504	Applications of AI and ML for Electrical Engineers	PCC	2	0	2	4	3
LABORATORY COURSES								
8	24EE3511	Power Electronics Laboratory	PCC	0	0	3	3	1.5
9	24EE3512	Microprocessor and Microcontroller Laboratory	PCC	0	0	3	3	1.5
PROFESSIONAL DEVELOPMENT COURSE								
10	24EE3572	Wiring and Winding	EEC	0	0	2	2	1
			TOTAL	**20**	**0**	**10**	**30**	**22**

& Mandatory Course-I is a Non-credit Course (Student shall select one course from the list given under MC- I).

SEMESTER VI

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY COURSES								
1	24EE3601	Protection and Switchgear	PCC	3	0	0	3	3

2	24EE3602	Power System Operation and Control	PCC	3	0	0	3	3
3		Open Elective-I*	OEC	3	0	0	3	3
4		Professional Elective III	PEC	3	0	0	3	3
5		Professional Elective IV	PEC	3	0	0	3	3
6		Mandatory Course-II[&]	MC	3	0	0	3	-
7		NCC Credit Course Level 3[#]	-	3	0	0	3	3[#]
THEORY COURSE WITH LABORATORY COMPONENT								
8	24CS3603	Cyber Security	ESC	2	0	2	4	3
LABORATORY COURSE								
9	24EE3611	Power system simulation Laboratory	PCC	0	0	3	3	1.5
PROFESSIONAL DEVELOPMENT COURSE								
10	24EE3672	IOT for Electrical Engineering	EEC	1	0	2	3	3
			TOTAL	**24**	**0**	**7**	**31**	**22.5**

*** Open Elective – I shall be chosen from the emerging technologies.**

& Mandatory Course-II is a Non-credit Course (Student shall select one course from the list given under MC- II).

 # NCC Credit Course level 3 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

SEMESTER VII / VIII*

S. No.	COURSE CODE	COURSE TITLE	CATEORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY COURSES								
1	24EE3701	High Voltage Engineering	PCC	3	0	0	3	3
2	24GE3791	Human values and Ethics	HSMC	2	0	0	2	2
3		Open Elective-II**	OEC	3	0	0	3	3
4		Open Elective-III***	OEC	3	0	0	3	3
5		Professional Elective V	PEC	3	0	0	3	3
THEORY COURSE WITH LABORATORY COMPONENT								
6	24EE3702	Renewable Energy Systems	PCC	3	0	2	5	4
PROFESSIONAL DEVELOPMENT COURSE								
7	24EE3772	PLC Automation	EEC	0	0	2	2	1
			TOTAL	**17**	**0**	**4**	**21**	**19**

***If students undergo internship in Semester VII, then the courses offered during semester VII will be offered during semester VIII.**

****Open Elective – II shall be chosen from the emerging technologies.**

*****Open Elective III and IV (shall be chosen from the list of open electives offered by other Programmes).**

SEMESTER VIII /VII*

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY COURSES								
1		Elective Management[#]	HSMC	3	0	0	3	3
2		Professional Elective VI	PEC	3	0	0	3	3
LABORATORY COURSE								
3	24EE3811	Project Work /Internship	EEC	0	0	20	20	10

TOTAL	**6**	**0**	**20**	**26**	**16**

 # Elective - Management shall be chosen from the Elective Management Courses.

***If students undergo internship in Semester VII, then the courses offered during semester VII will be offered during semester VIII.**

TOTAL CREDITS: 176

MANDATORY COURSES I

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24MX3081	Introduction to Women and Gender Studies	MC	3	0	0	3	0
2.	24MX3082	Elements of Literature	MC	3	0	0	3	0
3.	24MX3083	Film Appreciation	MC	3	0	0	3	0
4.	24MX3084	Disaster Risk Reduction and Management	MC	3	0	0	3	0

MANDATORY COURSES II

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24MX3085	Well Being with Traditional Practices - Yoga, Ayurveda and Siddha	MC	3	0	0	3	0
2.	24MX3086	History of Science and Technology in India	MC	3	0	0	3	0
3.	24MX3087	Political and Economic Thought for a Humane Society	MC	3	0	0	3	0
4.	24MX3088	State, Nation Building and Politics in India	MC	3	0	0	3	0
5.	24MX3089	Industrial Safety	MC	3	0	0	3	0

ELECTIVE MANAGEMENT COURSES

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	GE3751	Principles of Management	HSMC	3	0	0	3	3
2.	GE3752	Total Quality Management	HSMC	3	0	0	3	3
3.	GE3753	Engineering Economics and Financial Accounting	HSMC	3	0	0	3	3
4.	GE3754	Human Resource Management	HSMC	3	0	0	3	3
5.	GE3755	Knowledge Management	HSMC	3	0	0	3	3
6.	GE3792	Industrial Management	HSMC	3	0	0	3	3

PROFESSIONAL ELECTIVE COURSES: VERTICALS

VERTICAL 1	VERTICAL 2	VERTICAL 3	VERTICAL 4	VERTICAL 5	VERTICAL 6
POWER ENGINEERING	**CONVERTERS AND DRIVES**	**EMBEDDED SYSTEMS**	**ELECTRIC VEHICLE TECHNOLOGY**	**ADVANCED CONTROL**	**DIVERSIFIED COURSES**
Utilization and Conservation of Electrical Energy	Special Electrical Machines	Embedded System Design	Electric Vehicle Architecture	Process Modeling and Simulation	Energy Storage Systems
Under Ground Cable Engineering	Analysis of Electrical Machines	Embedded C-Programming	Design of Motor and Power Converters for Electric Vehicles	Computer Control of Processes	Hybrid Energy Technology
Substation Engineering and Automation	Multilevel Power Converters	Embedded Processors	Electric Vehicle Design, Mechanics and Control	System Identification	Design and Modelling of Renewable Energy Systems
HVDC and FACTS	Electrical Drives	Embedded Control for Electric Drives	Design of Electric Vehicle Charging System	Model Based Control	Grid integrating Techniques and Challenges
Energy Management and Auditing	SMPS and UPS	Smart System Automation	Testing of Electric Vehicles	Non Linear Control	Sustainable and Environmental Friendly HV Insulation System
Power Quality	Power Electronics for Renewable Energy Systems	Embedded System for Automotive Applications.	Grid Integration of Electric Vehicles	Optimal Control	Power System Transients
Smart Grids	Control of Power Electronics Circuits	VLSI Design	Intelligent control of Electric Vehicles.	Adaptive Control	Industry 5.0
Restructured Power Market	-	MEMS and NEMS	- -	Machine Monitoring System	Big Data Analytics
-	--	Digital Signal Processing System Design	-	-	-

Registration of Professional Elective Courses from Verticals:

Professional Elective Courses will be registered in Semesters V and VI. These courses are listed in groups called verticals that represent a particular area of specialisation / diversified group. Students are permitted to choose all the Professional Electives from a particular vertical or from different verticals. Further, only one Professional Elective course shall be chosen in a semester horizontally (row-wise). However, two courses are permitted from the same row, provided one course is enrolled in Semester V and another in semester VI.

The registration of courses for B.E./B.Tech (Honours) or Minor degree shall be done from Semester V to VIII. The procedure for registration of courses explained above shall be followed for the courses of B.E/B.Tech (Honours) or Minor degree also. For more details on B.E./B.Tech (Honours) or Minor degree refer to the Regulations 2021, Clause 4.10 (Amendments).

PROFESSIONAL ELECTIVE COURSES: VERTICALS

VERTICAL 1: POWER ENGINEERING

S. No.	Course Code	Course Title	Category	Periods Per week			Total Contact period	Credits
				L	T	P		
1.	24EE3001	Utilization and Conservation of Electrical Energy	PEC	3	0	0	3	3
2.	24EE3002	Under Ground Cable Engineering	PEC	3	0	0	3	3
3.	24EE3003	Substation Engineering and Automation	PEC	3	0	0	3	3
4.	24EE3004	HVDC and FACTS	PEC	3	0	0	3	3
5.	24EE3005	Energy Management and Auditing	PEC	3	0	0	3	3
6.	24EE3006	Power Quality	PEC	3	0	0	3	3
7.	24EE3007	Smart Grid	PEC	3	0	0	3	3
8.	24EE3008	Restructured Power Market	PEC	3	0	0	3	3

VERTICAL 2 CONVERTERS AND DRIVES

S. No.	Course Code	Course Title	Category	Periods Per week			Total Contact period	Credits
				L	T	P		
1.	24EE3009	Special Electrical Machines	PEC	2	0	2	4	3
2.	24EE3010	Analysis of Electrical Machines	PEC	2	0	2	4	3
3.	24EE3011	Multilevel Power Converters	PEC	2	0	2	4	3
4.	24EE3012	Electrical Drives	PEC	2	0	2	4	3
5.	24EE3013	SMPS and UPS	PEC	2	0	2	4	3
6.	24EE3014	Power Electronics for Renewable Energy Systems	PEC	2	0	2	4	3
7.	24EE3015	Control of Power Electronics Circuits	PEC	2	0	2	4	3

VERTICAL 3: EMBEDDED SYSTEMS

S. No.	Course Code	Course Title	Category	Periods Per week			Total Contact Period	Credits
				L	T	P		
1.	24EE3016	Embedded System Design	PEC	2	0	2	4	3
2.	24EE3017	Embedded C- programming	PEC	2	0	2	4	3
3.	24EE3018	Embedded Processors	PEC	2	0	2	4	3
4.	24EE3019	Embedded Control for Electric Drives	PEC	2	0	2	4	3
5.	24EE3020	Smart System Automation	PEC	2	0	2	4	3

6.	24EE3021	Embedded System for Automotive Applications	PEC	2	0	2	4	3
7.	24EE3022	VLSI Design	PEC	2	0	2	4	3
8.	24EE3023	MEMS and NEMS	PEC	2	0	2	4	3
9.	24EE3024	Digital Signal Processing System Design	PEC	2	0	2	4	3

VERTICAL 4: ELECTRIC VEHICLE TECNOLOGY

S. No.	Course Code	Course Title	Category	Periods Per week			Total Contact Period	Credits
				L	T	P		
1.	24EE3025	Electric Vehicle Architecture	PEC	3	0	0	3	3
2.	24EE3026	Design of Motor and Power Converters for Electric Vehicles	PEC	2	0	2	4	3
3.	24EE3027	Electric Vehicle Design, Mechanics and Control	PEC	2	0	2	4	3
4.	24EE3028	Design of Electric Vehicle Charging System	PEC	2	0	2	4	3
5.	24EE3029	Testing of Electric Vehicles	PEC	2	0	2	4	3
6.	24EE3030	Grid Integration of Electric Vehicles	PEC	3	0	0	3	3
7.	24EE3031	Intelligent Control of Electric Vehicles	PEC	2	0	2	4	3

VERTICAL 5: ADVANCED CONTROL

S. No.	Course Code	Course Title	Category	Periods Per week			Total Contact Period	Credits
				L	T	P		
1.	24CIC331	Process Modeling and Simulation	PEC	3	0	0	3	3
2.	24CIC332	Computer Control of Processes	PEC	3	0	0	3	3
3.	24CIC333	System Identification	PEC	3	0	0	3	3
4.	24CIC336	Model Based Control	PEC	3	0	0	3	3
5.	24CIC334	Non Linear Control	PEC	3	0	0	3	3
6.	24CIC337	Optimal Control	PEC	3	0	0	3	3
7.	24CIC335	Adaptive Control	PEC	3	0	0	3	3
8.	24CIC338	Machine Monitoring System	PEC	3	0	0	3	3

VERTICAL 6: DIVERSIFIED COURSES

S. No.	Course Code	Course Title	Category	Periods Per week			Total Contact Periods	Credits
				L	T	P		

1.	24EE3032	Energy Storage Systems	PEC	3	0	0	3	3
2.	24EE3033	Hybrid Energy Technology	PEC	3	0	0	3	3
3.	24EE3034	Design and Modeling of Renewable Energy Systems	PEC	3	0	0	3	3
4.	24EE3035	Grid integrating Techniques and Challenges	PEC	2	0	2	4	3
5.	24EE3036	Sustainable and Environmental Friendly HV Insulation System	PEC	3	0	0	3	3
6.	24EE3037	Power System Transients	PEC	3	0	0	3	3
7.	24CEI331	Industry 5.0	PEC	2	0	2	4	3
8.	24CCS334	Big Data Analytics	PEC	2	0	2	4	3

OPEN ELECTIVES

(Students shall choose the open elective courses, such that the course contents are not similar to any other course contents/title under other course categories)

OPEN ELECTIVE I AND II

(EMERGING TECHNOLOGIES)

To be offered other than Faculty of Information and Communication Engineering

S. No.	Course Code	Course Title	Category	Periods Per week			Total Contact Periods	Credits
				L	T	P		
1.	24OCS351	Artificial Intelligence and Machine Learning Fundamentals	OEC	2	0	2	4	3
2.	24OCS352	IoT Concepts and Applications	OEC	2	0	2	4	3
3.	24OCS353	Data Science Fundamentals	OEC	2	0	2	4	3
4.	24CCS333	Augmented Reality / Virtual Reality	OEC	2	0	2	4	3

OPEN ELECTIVES – III

S. No.	Course Code	Course Title	Category	Periods Per week			Total Contact Periods	Credits
				L	T	P		
1.	24OCE353	Lean Concepts, Tools And Practices	OEC	3	0	0	3	3
2.	24OHS351	English for Competitive Examinations	OEC	3	0	0	3	3
3.	24OMG352	NGOs and Sustainable Development	OEC	3	0	0	3	3
4.	24OMG353	Democracy and Good Governance	OEC	3	0	0	3	3
5.	24OME354	Applied Design Thinking	OEC	3	0	0	3	3
6.	24MF3003	Reverse Engineering	OEC	3	0	0	3	3
7.	24OPR351	Sustainable Manufacturing	OEC	3	0	0	3	3
8.	24AU3791	Electric and Hybrid Vehicles	OEC	3	0	0	3	3
9.	24OAS352	Space Engineering	OEC	3	0	0	3	3
10.	24OIM351	Industrial Management	OEC	3	0	0	3	3
11.	24OIE354	Quality Engineering	OEC	3	0	0	3	3
12.	24OSF351	Fire Safety Engineering	OEC	3	0	0	3	3
13.	24OAE352	Fundamentals of Aeronautical engineering	OEC	3	0	0	3	3
14.	24OML351	Introduction to non-destructive testing	OEC	3	0	0	3	3
15.	24OMR351	Mechatronics	OEC	3	0	0	3	3
16.	24ORA351	Foundation of Robotics	OEC	3	0	0	3	3
17.	24OGI351	Remote Sensing Concepts	OEC	3	0	0	3	3
18.	24OAI351	Urban Agriculture	OEC	3	0	0	3	3
19.	24OEN351	Drinking Water Supply and Treatment	OEC	3	0	0	3	3
20.	24OEE352	Electric Vehicle Technology	OEC	3	0	0	3	3
21.	24OEI353	Introduction to PLC Programming	OEC	3	0	0	3	3
22.	24OCH351	Nano Technology	OEC	3	0	0	3	3
23.	24OCH352	Functional Materials	OEC	3	0	0	3	3
24.	24OFD352	Traditional Indian Foods	OEC	3	0	0	3	3
25.	24OFD353	Introduction to food processing	OEC	3	0	0	3	3
26.	24OPY352	IPR for Pharma Industry	OEC	3	0	0	3	3

27.	24OTT351	Basics of Textile Finishing	OEC	3	0	0	3	3
28.	24OTT352	Industrial Engineering for Garment Industry	OEC	3	0	0	3	3
29.	24OTT353	Basics of Textile Manufacture	OEC	3	0	0	3	3
30.	24OPE351	Introduction to Petroleum Refining and Petrochemicals	OEC	3	0	0	3	3
31.	24OPE334	Energy Conservation and Management	OEC	3	0	0	3	3
32.	24OPT351	Basics of Plastics Processing	OEC	3	0	0	3	3
33.	24OEC351	Signals and Systems	OEC	3	0	0	3	3
34.	24OEC352	Fundamentals of Electronic Devices and Circuits	OEC	3	0	0	3	3
35.	24CBM348	Foundation Skills in integrated product Development	OEC	3	0	0	3	3
36.	24CBM333	Assistive Technology	OEC	3	0	0	3	3
37.	24OMA352	Operations Research	OEC	3	0	0	3	3
38.	24OMA353	Algebra and Number Theory	OEC	3	0	0	3	3
39.	24OMA354	Linear Algebra	OEC	3	0	0	3	3
40.	24OBT352	Basics of Microbial Technology	OEC	3	0	0	3	3
41.	24OBT353	Basics of Biomolecules	OEC	3	0	0	3	3
42.	24OBT354	Fundamentals of Cell and Molecular Biology	OEC	3	0	0	3	3
27.	24OTT351	Basics of Textile Finishing	OEC	3	0	0	3	3
28.	24OTT352	Industrial Engineering for Garment Industry	OEC	3	0	0	3	3
29.	24OTT353	Basics of Textile Manufacture	OEC	3	0	0	3	3
30.	24OPE351	Introduction to Petroleum Refining and Petrochemicals	OEC	3	0	0	3	3
31.	24OPE334	Energy Conservation and Management	OEC	3	0	0	3	3
32.	24OPT351	Basics of Plastics Processing	OEC	3	0	0	3	3
33.	24OEC351	Signals and Systems	OEC	3	0	0	3	3
34.	24OEC352	Fundamentals of Electronic Devices and Circuits	OEC	3	0	0	3	3
35.	24CBM348	Foundation Skills in integrated product Development	OEC	3	0	0	3	3
36.	24CBM333	Assistive Technology	OEC	3	0	0	3	3

37.	24OMA352	Operations Research	OEC	3	0	0	3	3
38.	24OMA353	Algebra and Number Theory	OEC	3	0	0	3	3
39.	24OMA354	Linear Algebra	OEC	3	0	0	3	3
40.	24OBT352	Basics of Microbial Technology	OEC	3	0	0	3	3
41.	24OBT353	Basics of Biomolecules	OEC	3	0	0	3	3
42.	24OBT354	Fundamentals of Cell and Molecular Biology	OEC	3	0	0	3	3

OPEN ELECTIVES – IV

S. No.	Course Code	Course Title	Category	Periods Per week			Total Contact Periods	Credits
				L	T	P		
1.	24OHS352	Project Report Writing	OEC	3	0	0	3	3
2.	24OMA355	Advanced Numerical Methods	OEC	3	0	0	3	3
3.	24OMA356	Random Processes	OEC	3	0	0	3	3
4.	24OMA357	Queuing and Reliability Modelling	OEC	3	0	0	3	3
5.	24OMG354	Production and Operations Management for Entrepreneurs	OEC	3	0	0	3	3
6.	24OMG355	Multivariate Data Analysis	OEC	3	0	0	3	3
7.	24OME352	Additive Manufacturing	OEC	3	0	0	3	3
8.	24CME343	New Product Development	OEC	3	0	0	3	3
9.	24OME355	Industrial Design & Rapid Prototyping Techniques	OEC	3	0	0	3	3
10.	24MF3010	Micro and Precision Engineering	OEC	3	0	0	3	3
11.	24OMF354	Cost Management of Engineering Projects	OEC	3	0	0	3	3
12.	24AU3002	Batteries and Management System	OEC	3	0	0	3	3
13.	24AU3008	Sensors and Actuators	OEC	3	0	0	3	3
14.	24OAS353	Space Vehicles	OEC	3	0	0	3	3
15.	24OIM352	Management Science	OEC	3	0	0	3	3
16.	24OIM353	Production Planning and Control	OEC	3	0	0	3	3
17.	24OIE353	Operations Management	OEC	3	0	0	3	3
18.	24OSF352	Industrial Hygiene	OEC	3	0	0	3	3
19.	24OSF353	Chemical Process Safety	OEC	3	0	0	3	3
20.	24OML352	Electrical, Electronic and Magnetic Materials	OEC	3	0	0	3	3
21.	24OML353	Nanomaterials and Applications	OEC	3	0	0	3	3
22.	24OMR352	Hydraulics and Pneumatics	OEC	3	0	0	3	3
23.	24OMR353	Sensors	OEC	3	0	0	3	3
24.	24ORA352	Concepts in Mobile Robots	OEC	3	0	0	3	3
25.	24MV3501	Marine Propulsion	OEC	3	0	0	3	3
26.	24OMV351	Marine Merchant Vessels	OEC	3	0	0	3	3
27.	24OMV352	Elements of Marine Engineering	OEC	3	0	0	3	3
28.	24CRA332	Drone Technologies	OEC	3	0	0	3	3
29.	24OGI352	Geographical Information System	OEC	3	0	0	3	3

30.	24OAI352	Agriculture Entrepreneurship Development	OEC	3	0	0	3	3
31.	24OEN352	Biodiversity Conservation	OEC	3	0	0	3	3
32.	24OCE354	Basics of Integrated Water Resources Management	OEC	3	0	0	3	3
33.	24OEI354	Introduction to Industrial Automation Systems	OEC	3	0	0	3	3
34.	24OCH353	Energy Technology	OEC	3	0	0	3	3
35.	24OCH354	Surface Science	OEC	3	0	0	3	3
36.	24OFD354	Fundamentals of Food Engineering	OEC	3	0	0	3	3
37.	24OFD355	Food Safety and Quality Regulations	OEC	3	0	0	3	3
38.	24OPY353	Nutraceuticals	OEC	3	0	0	3	3
39.	24OTT354	Basics of Dyeing and Printing	OEC	3	0	0	3	3
40.	24FT3201	Fibre Science	OEC	3	0	0	3	3
41.	24OTT355	Garment Manufacturing Technology	OEC	3	0	0	3	3
42.	24OPE353	Industrial Safety	OEC	3	0	0	3	3
43.	24OPE354	Unit Operations in Petro Chemical Industries	OEC	3	0	0	3	3
44.	24OPT352	Plastic Materials for Engineers	OEC	3	0	0	3	3
45.	24OPT353	Properties and Testing of Plastics	OEC	3	0	0	3	3
46.	24OEC353	VLSI Design	OEC	3	0	0	3	3
47.	24CBM370	Wearable Devices	OEC	3	0	0	3	3
48.	24CBM356	Medical Informatics	OEC	3	0	0	3	3
49.	24OBT355	Biotechnology for Waste Management	OEC	3	0	0	3	3
50.	24OBT356	Lifestyle Diseases	OEC	3	0	0	3	3
51.	24OBT357	Biotechnology in Health Care	OEC	3	0	0	3	3

SUMMARY

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING										
S.No.	**Category**	**Credits per Semester**								**Total Credits**
		I	**II**	**III**	**IV**	**V**	**VI**	**VII/VIII**	**VIII/VII**	
1	**HSMC**	3	3					2	3	**11**
2	**BSC**	8	8	4	2					**22**
3	**ESC**	10	9	4	4		3			**30**
4	**PCC**		5	15.5	17	15	7.5	7		**67**
5	**PEC**					6	6	3	3	**18**
6	**OEC**						3	6		**9**
7	**EEC**	2	1	1	1	1	3	1	10	**20**
8	**Non-Credit/ (Mandatory)**					✓	✓			
Total		**23**	**26**	**24.5**	**23**	**22**	**22.5**	**19**	**16**	**177**

24HS3151	FUNCTIONAL ENGLISH	L	T	P	C
		2	0	0	2

COURSE OBJECTIVES:

1. To develop engineering and technology students basic reading and writing skills.
2. To help learners develop their listening skills, enable them to listen to lectures and comprehend them by asking questions; and seeking clarifications.
3. To help learners develop their speaking skills and speak fluently in real contexts.
4. To help learners develop vocabulary of a general kind by developing their reading skills

UNIT I BASIC ENGLISH FOR EFFECTIVE COMMUNICATION 6

Listening: Listening to short extracts-British Council B1 & B2 speaking: Self Introduction, introducing others, Extempore, Impromptu, Reading: Reading short stories, comprehension - skimming-scanning Writing: Developing hints, Free writing Language development: Present Tense, Articles, Modal Verbs Vocabulary development: – Word formation –Prefixes & Suffixes, root words.

UNIT – II CONTEXTUAL COMMUNICATION SKILLS 6

Listening: Telephonic conversations, conceptual conversations, Listening to experience speaking: Sharing information of a personal kind, greeting, taking leave, Manuscript, Memorized Reading: Reading newspapers and understanding the context Writing: Paragraph writing -Day-to-day events, Cloze exercises Language development: Past Tense, Subject-verb Agreement Vocabulary development: Guessing meanings of words in context.

UNIT – III DISCOURSE AND STRUCTURE 6

Listening: Listening to product descriptions; and narratives from different sources-speaking: Short presentation, asking about routine actions and expressing facts and opinions, Reading: Interpreting pictures of visual graphics- Reading and reviewing Books/Articles Writing: Understanding text structure, jumbled sentences -Language development: Future Tense, Degrees of comparison, Gerunds and Infinitives -Vocabulary development: use of reference words and discourse markers, Idioms and Phrases

UNIT – IV INTERACTIVE AND WRITTEN COMMUNICATION 6

Listening- Listening to dialogues - listening to longer texts and filling up the blanks, speaking-Role Play, Travelogue -Reading: Reading different types of magazines Writing: Formal and Informal letter writing, E-mail etiquette Language development: Wh questions- Question Tags Vocabulary development: synonyms-antonyms, phrasal verbs, If Conditional Clause

UNIT – V ACADEMIC FLUENCY AND STRUCTURED EXPRESSION 6

Listening: Listening to a podcas speaking: conversational speaking, short group conversations, Reading: Journals both general and technical Writing: Writing short essays, hints development, dialogue writingLanguage development: Spelling and Punctuations, Cause and Effect, Transition words,Vocabulary development-collocations, Use of sequence words .

TOTAL: 30 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Write effectively and flawlessly avoiding grammatical errors in a variety of professional and social settings.

CO2 Utilize appropriate writing strategies in technical and business context.

CO3 Make use of listening skills in business and workplace environments and relates to oral communication confidently.

CO4 Develop corporate test-taking strategies as well as employability skills.

CO5 Exhibits learners' reading skills for effective communication in personal and official conversations / situations .

TEXT BOOKS:

1. Board of Editors. Fluency in English A course book for Engineering and Technology. Orient Blackswan, Hyderabad: 2016.
2. Rizvi, Ashraf. M. Effective Technical Communication, Tata McGraw-Hill, New Delhi, 2017

REFERENCES:

1. Raman, Meenakshi and Sharma, Sangeetha "Technical Communication Principles and Practice" Oxford University Press: New Delhi, 2014
2. Kumar, Suresh. E. "Engineering English" Orient Blackswan: Hyderabad, 2015.
3. Muralikrishna, & Sunita Mishra. Communication Skills for Engineers. Pearson, New Delhi. 2011.
4. Mitra K. Barun, "Effective Technical Communication – A Guide for Scientists and Engineers", Oxford University Press, New Delhi, 2006.

CO's-PO's & PSO's MAPPING:

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	1	1	1	1	1	3	3	1	3		3		
2	1	1	1	1	1	3	3	1	3		3		
3	2	3	2	3	2	3	3	2	3	3	3		
4	2	3	2	3	2	3	3	2	3	3	3		
5	2	3	3	3		3	3	2	3		3		
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

(D. Indumathi)
AP/Eng.

BoS Chairman / HoD (S&H)

24MA3151	MATRICES AND CALCULUS	L	T	P	C
		3	1	0	4

COURSE OBJECTIVES:

1. To develop the use of matrix algebra techniques that is needed by engineers for practical application
2. To familiarize the students with concepts of differential calculus.
3. To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems.
4. To familiarize the student with functions of several variables.
5. To make the students understand various techniques of integration.

UNIT I MATRICES **9+3**

Eigenvalues and Eigenvectors of a real matrix – Characteristic equation – Properties of Eigenvalues and Eigenvectors – Cayley - Hamilton theorem – Diagonalization of matrices by orthogonal transformation – Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms – Applications: Stretching of an elastic membrane.

UNIT – II DIFFERENTIAL CALCULUS **9+3**

Representation of functions - Limit of a function - Continuity - Derivatives - Differentiation rules - Maxima and Minima of functions of one variable.

UNIT – III DIFFERENTIAL EQUATIONS **9+3**

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy's and Legendre's linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT – IV FUNCTIONS OF SEVERAL VARIABLES **9+3**

Limits and Continuity – Partial derivatives – Total derivative – Differentiation of implicit functions – Jacobian and properties – Taylor's series for functions of two variables – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers

UNIT – V INTEGRAL CALCULUS **9+3**

Definite and Indefinite integrals - Substitution rule - Techniques of Integration: Integration by parts, Trigonometric substitutions, Double integrals – Area enclosed by plane curves.

TOTAL: 45+15 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Use the matrix algebra methods for solving practical problems.
CO2 Use both the limit definition and rules of differentiation to differentiate functions
CO3 Explain the concept of differential equation.
CO4 Use differential calculus ideas on several variable functions.
CO5 Evaluate integrals both by using Riemann sums and by using the fundamental theorem of calculus.

TEXT BOOKS:

1. Bali N. P and Manish Goyal, "A Text book of Engineering Mathematics", Eighth Edition, Laxmi Publications Pvt Ltd., 2011.
2. Grewal. B.S, "Higher Engineering Mathematics", 41st Edition, Khanna Publications, Delhi, 2011.
3. Kreyszig Erwin, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2016

REFERENCES:

1. Dass, H.K., and Er. Rajnish Verma," Higher Engineering Mathematics", S. Chand Private Ltd., 2011.
2. Glyn James, "Advanced Modern Engineering Mathematics", 3rd Edition, Pearson Education, 2012
3. Peter V. O'Neil," Advanced Engineering Mathematics", 7th Edition, Cengage learning, 2012.
4. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, 2008.
5. Sivarama Krishna Das P. and Rukmangadachari E., "Engineering Mathematics", Volume I, Second Edition, PEARSON Publishing, 2011.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	1	1				2		2	3		
2	3	3	1	1				2		2	3		
3	3	3	1	1				2		2	3		
4	3	3	1	1				2		2	3		
5	3	3	1	1				2		2	3		
Low (1) ; Medium (2) ; High (3)													

Course Coordinator **BOS Chairman/ HoD(S&H)**

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24GE3151	PROGRAMMING IN C	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

1. To understand the constructs of C Language.
2. To develop C programs using arrays and strings.
3. To develop modular applications in C using functions.
4. To develop applications in C using pointers and structures.
5. To do input/output and file handling in C.

UNIT I BASICS OF C PROGRAMMING **9**

Introduction to programming and features – Applications of C Language - Structure of C program - C programming: Data Types - Constants – Keywords – Operators and Expression Precedence and Associativity- Input/Output and assignment statements – Decision making statements - Switch statement - Looping statements – Preprocessor directives - Compilation process

UNIT II ARRAYS AND STRINGS **9**

Introduction to Arrays: Declaration, Initialization – One dimensional array –Two dimensional arrays - String operations: length, compare, concatenate, copy – Selection sort, linear and binary search.

UNIT III FUNCTIONS AND POINTERS **9**

Function prototype, function definition, function call, Built-in functions (string functions) – Recursion – Pointers – Null pointer and generic pointer – Pointer arithmetic – Arrays and pointers – Array of pointers – Parameter passing: Pass by value, Pass by reference.

UNIT – IV STRUCTURES AND UNION **9**

Structure - Nested structures – Pointer and Structures – Array of structures – Self-referential structures – Dynamic memory allocation - Singly linked list – typedef – Union - Storage classes and Visibility.

UNIT – V FILE PROCESSING **9**

Files – Types of file processing: Sequential access, Random access – Sequential access file - Random access- Command line arguments.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

Upon completion of the course, the students will be able to

CO1 Demonstrate knowledge on C Programming constructs.
CO2 Design and implement applications using arrays and strings
CO3 Develop and implement modular applications in C using functions.
CO4 Develop applications in C using structures and pointers.
CO5 Design applications using sequential and random-access file processing.

TEXT BOOKS:

1. ReemaThareja, "Programming in C", Oxford University Press, Second Edition, 2016.
2. Kernighan, B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2015.

REFERENCES:

1. Paul Deitel and Harvey Deitel, "C How to Program with an Introduction to C++", Eighth edition, Pearson Education, 2018.
2. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
3. Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw- Education, 1996.
4. Pradip Dey, Manas Ghosh, "Computer Fundamentals and Programming in C", Second
5. Edition, Oxford University Press, 2013.
6. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", 1st Edition, Pearson Education, 2013.

CO's-PO's & PSO's MAPPING

COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	1	2	2	1	2	1	1	1	2		3	2	1
2	2	2	2	1	2	1	1	1	2		3	3	2
3	2	3	2	1	2	1	1	1	2		3		2
4	3	2	2	1	3	1	1	1	2		3	3	2
5	2	3	3	1	2	1	2	1	2		3		2
Low (1) ; Medium (2) ; High (3)													

COURSE COORDINATOR

BOS CHAIRMAN / HOD

24BE3155 BASIC CIVIL AND MECHANICAL ENGINEERING

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. To provide the students an illustration of the significance of the Civil and Mechanical Engineering Profession in satisfying the societal needs.
2. To help students acquire knowledge in the basics of surveying and the materials used for construction.
3. To provide an insight to the essentials of components of a building and the infrastructure facilities.
4. To explain the component of power plant units and detailed explanation to IC engines their working principles.
5. To explain the Refrigeration & Air-conditioning system.

UNIT – I PART A: OVERVIEW OF CIVIL ENGINEERING 5

Civil Engineering contributions to the welfare of Society - Specialized sub disciplines in Civil Engineering – National building code – terminologists: Plinth area, Carpet area, Floor area, Build-up area, Floor space index - Types of buildings: Residential buildings, Industrial buildings.

UNIT – I PART B: OVERVIEW OF MECHANICAL ENGINEERING 4

Overview of Mechanical Engineering - Mechanical Engineering Contributions to the welfare of Society –Specialized sub disciplines in Mechanical Engineering – Manufacturing, Automation, Automobile and Energy Engineering.

UNIT – II SURVEYING AND CIVIL ENGINEERING MATERIALS 9

Surveying: Objects – Classification – Principles – Measurements of Distances and angles – Levelling – Determination of areas– Contours. Civil Engineering Materials: Bricks – Stones – Sand – Cement – Concrete – Steel - Timber - Modern Materials, Thermal and Acoustic Insulating Materials, Decorative Panels, Water Proofing Materials.

UNIT – III BUILDING COMPONENTS AND INFRASTRUCTURE 9

Building plans – Setting out of a Building - Foundations: Types of foundations - Bearing capacity and settlement – Brick masonry – Stone Masonry – Beams – Columns – Lintels – Roofing – Flooring – Plastering. Types of Bridges and Dams – Water Supply Network - Rain Water Harvesting – Solid Waste Management.

UNIT – IV INTERNAL COMBUSTION ENGINES AND POWER PLANTS 9

Classification of Power Plants- Working principle of Steam, Diesel, Hydro-electric power plants, Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines.

UNIT – V REFRIGERATION AND AIR CONDITIONING SYSTEM 9

Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system–Layout of typical domestic refrigerator–Window and Split type room Air conditioner.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Understanding profession of Civil and Mechanical engineering.

CO2 Apply basics of surveying and construction materials in civil engineering.

CO3 Understand building components, foundation types, and basic infrastructure systems.

CO4 Understand the working principles of power plants and describe the fundamental concepts of internal combustion engines.

CO5 Understand the domestic refrigeration and air conditioning system.

TEXT BOOKS:

1. G Shanmugam, M S Palanichamy, Basic Civil and Mechanical Engineering, McGraw Hill Education; First edition, 2018.
2. Venugopal K and Prahu Raja V, "Basic Mechanical Engineering", Anuradha Publishers, Kumbakonam, (2000).

REFERENCES:

1. Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2018.
2. Ramamrutham S., "Basic Civil Engineering", Dhanpat Rai Publishing Co.(P) Ltd, 2013.
3. Seetharaman S., "Basic Civil Engineering", Anuradha Agencies, 2005.
4. Shantha Kumar SRJ., "Basic Mechanical Engineering", Hi-tech Publications, Mayiladuthurai, 2000.
5. Vijay Sankar.K., Pream Kumar.S, "Basic Civil and Mechanical Engineering", Charulatha Publications, 2025.

CO's - PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	2			1		1	2	1	2		1		
2	2					1	2	1	2		2		
3	2					1	2	2	2		2		
4	2					1	2	1	2		2		
5	2					1	2	1	2		2		
Low (1) ; Medium (2) ; High (3)													

COURSE INSTRUCTOR

BOS CHAIRMAN

24GE3152 **தமிழர் மரபு** **L T P C**
1 0 0 1

COURSE OBJECTIVES:

1. இந்திய மொழிக் குடும்பங்கள் பற்றிய அறிவை வழங்குதல், திராவிட மொழிகள் மற்றும் தமிழ் ஒரு செம்மொழியாக நிலை பெறுதல்.
2. பாறை ஓவியங்கள் முதல் நவீன சிற்பங்கள் வரை தமிழ் கலையை ஆய்வு செய்தல், அதன் வரலாற்று மற்றும் கலாச்சார சூழலைப் புரிந்துகொள்வது.
3. நாட்டுப்புறக் கலைகளை ஆராய்தல், தமிழ் கலாச்சாரம் மற்றும் சமூகத்தில் அவற்றின் பங்கைப் புரிந்துகொள்வது.
4. தமிழ் கல்வெட்டுகளின் வரலாறு மற்றும் பரிணாம வளர்ச்சியைப் புரிந்து கொள்ளுதல்
5. இந்திய சுதந்திரப் போராட்டத்தில் தமிழர்களின் பங்கை பகுப்பாய்வு செய்தல்.

அலகு I மொழி மற்றும் இலக்கியம் **3**

இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி -தமிழ் செவ்விலக்கியங்கள் – சங்க இலக்கியங்களில் அகவாழ்வு மற்றும் புறவாழ்வு - திருக்குறளில் மேலாண்மைக் கருத்துக்கள் - தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு – II மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை **3**

நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள்- பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - சுடுமண் சிற்பங்கள் - குமரிமுனையில் திருவள்ளுவர் சிலை

அலகு– III நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள் **3**

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஒயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம் - இசைக் கருவிகள் மிருதங்கம், பறை, வீணை, யாழ், தமிழர்களின் விளையாட்டுகள்.

அலகு – IV கல்வெட்டு மற்றும் தொல்லியல் **3**

கல்வெட்டின் வரலாறு உத்தரமேரூர் கல்வெட்டு – தேர்தல் முறைகள் - தஞ்சாவூர் பெருவுடையார் கோயில் கல்வெட்டு – தொல்லியல் என்றால் என்ன? அதன் பணி - தமிழர் நகரங்கள் ; பூம்புகார், கீழடி ,அரிக்காமேடு, ஆதிச்சநல்லூர்

அலகு – V இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு **3**

இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு - சமூக நீதி மற்றும் சமத்துவ இயக்கங்கள் -சுயமரியாதை இயக்கம்- பெண்கள் உரிமை மற்றும் சமூக எழுச்சி இயக்கம் - சமூக நீதிக்கான சட்டங்கள் – இடஒதுக்கீடு மற்றும் கல்வி வாய்ப்பு

TOTAL: 15 PERIODS

24GE3152 **HERITAGE OF TAMIL** **L T P C**
1 0 0 1

COURSE OBJECTIVES:

1. To provide the knowledge on the Indian language families, focusing on Dravidian languages and the status of Tamil as a classical language.
2. To study the Tamil art from ancient rock paintings to modern sculptures, understanding its historical and cultural context
3. To explore folk arts like Therukuthu, Karagattam, Villupattu, and Silambattam, understanding their role in Tamil culture and society
4. To understand the history and evolution of Tamil inscriptions, from the Brahmi script to the Tamil Vatteluthu script
5. To analyze the role of Tamils in the Indian Freedom Struggle, highlighting their significant contributions.

UNIT I LANGUAGE AND LITERATYRE **3**

Language Families in India - Dravidian Languages – Tamil as a Classical Language - Classical Literature in Tamil— Inner life and outer life in Sangam literature- Management Principles in Thirukural - Development of Modern literature in Tamil - Contribution of Bhàrathiyar and Bharathidhasan.

UNIT – II HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE 3

Hero stone to modern sculpture - Bronze statues - Tribals and their handicrafts, toys - Clay sculptures - Thiruvalluvar statue at Kumarimunai

UNIT – III FOLK AND MARTIAL ARTS **3**

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, Silambattam, Valari, Tiger dance - Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram Sports and Games of Tamils.

UNIT – IV INSCRIPTION AND ARCHAEOGY **3**

History of Inscription Uttaramerur Inscription – Election Methods - Thanjavur Peruvudaiyar Temple Inscription – What is Archaeology? Its Work - Tamil Cities; Poompuhar, Keezhadi, Arikkamedu,

UNIT – V CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE **3**

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - - Women's Rights and Social Uprising Movement - Laws for Social Justice - Reservation and Educational Opportunity.

TOTAL: 15 PERIODS

பாடநூல் / TEXT BOOKS:

1. தமிழக வரலாறு மக்களும் பண்பாடும் கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்.
2. கணினித் தமிழ் -முனைவர் இல, சுந்தரம், (விகடன் பிரசுரம்).
3. கீழடி வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)
5. Social Life of Tamils (Dr.K.K. Pillay) A joint publication of TNTB & ESC and RMRL-(in print)
6. Social Life of the Tamils The Classical Period (Dr.S. Singaravelu) (Published by: International Institute of Tamil Studies.
7. Historical Heritage of the Tamils (Dr.S.V. Subatamanian, Dr. K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).

பார்வை நூல் : REFERENCES:

1. The Contributions of the Tamils to Indian Culture (Dr. M. Valarmathi) (Published by: International Institute of Tamil Studies.)
2. Keeladi - 'Sangam City Civilization on the banks of river Vaigai (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation,
3. Tamil Nadu) Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
4. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
5. Journey of Civilization Indus to Vaigai (R. Balakrishnan) (Published by: RMRL) - Reference Book.

Course Coordinator **BoS Chairman / HoD (S&H)**

24CY3051	ENGINEERING CHEMISTRY	L	T	P	C
		3	0	2	4

COURSE OBJECTIVES:

1. To inculcate sound understanding of water quality parameters and sample analysis methodologies.
2. To impart knowledge on the basic principles and preparatory methods of nanomaterials.
3. To introduce the basic concepts and applications of phase rule and alloys.
4. To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices.
5. To make students understand the fundamentals of polymer chemistry.

UNIT I WATER TREATEMENT & ANALYSIS **9**

Water: Sources and impurities, Water quality parameters, Boiler troubles: Scale and sludge, Boiler corrosion, Caustic embrittlement, Priming & Foaming. Desalination of brackish water: Reverse Osmosis Treatment of boiler feed water: Internal treatment (phosphate, colloidal, sodium aluminate and calgon conditioning) and External treatment – Ion exchange demineralization.

UNIT – II NANOCHEMISTRY **9**

Basics: Distinction between molecules, nanomaterials and bulk materials. Types of nanomaterials: definition, properties and uses of nanorods, nanowire and nanotube .Properties of nanomaterials (optical, electrical, mechanical and magnetic). Preparation of nanomaterials: Laser ablation, electrochemical deposition and electro spinning. Applications of nanomaterials in medicine, agriculture, energy, electronics and catalysis.

UNIT – III PHASE RULE AND ALLOYS **9**

Phase rule: Introduction, Terms. One component system – water system; Reduced phase rule; Construction of a simple eutectic phase diagram - Two component system: lead-silver system, Alloys: Introduction- Definition- properties of alloys- significance of alloying, functions and effect of alloying elements- Nichrome and stainless steel (18/8) – heat treatment of steel.

UNIT – IV ENERGY SOURCES AND STORAGE DEVICES **9**

Nuclear energy: light water nuclear power plant, breeder reactor. Solar energy conversion - Recent developments in solar cell materials. Geothermal energy; Batteries: Types of batteries, Primary battery – dry cell, Secondary battery – lead acid battery and lithium-ion battery; Electric vehicles – working principles; Fuel cells: H_2-O_2 fuel cell.

UNIT – V POLYMER CHEMISTRY **9**

Introduction: Classification of polymers – Natural and synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerization. Types and mechanism of polymerization: Addition (Free Radical, cationic and anionic); condensation and copolymerization. Preparation, properties and uses of Nylon 6,6, and Epoxy resin.

TOTAL: 45 PERIODS

LIST OF EXPERIMENTS

1. Preparation of Na_2CO_3 as a primary standard and estimation of acidity of a water sample using the primary standard.
2. Determination of total, temporary & permanent hardness of water by EDTA method.
3. Determination of chloride content of water sample by Argentometric method.
4. Determination of strength of given hydrochloric acid using pH meter.
5. Synthesis of ZnO nanoparticles.

TOTAL : 30 PERIODS

TOTAL : 45+30 = 75 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 To give proper water treatment methods for analysing the acid, hardness, chloride and the pH metry methodology.

CO2 To recognize and use fundamental ideas in nanoscience and nanotechnology when planning the synthesis of nanomaterials for engineering and technological use.

CO3 To utilize the phase rule and alloys expertise to work for the needs of material selection.

CO4 To identify various energy resource types and use them for proper uses in the energy sector.

CO5 To educate students the fundamentals of polymer chemistry.

TEXT BOOKS:

1. P. C. Jain and Monica Jain, "Engineering Chemistry", 17th Edition, Dhanpat Rai Publishing Company (P) Ltd, New Delhi, 2018.
2. Sivasankar B., "Engineering Chemistry", Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2008.
3. S.S. Dara, "A Text book of Engineering Chemistry", S. Chand Publishing, 12th Edition, 2018.
4. O.G. Palanna, "Engineering Chemistry" McGraw Hill Education (India) Private Limited, 2nd Edition, 2017.

REFERENCES:

1. B. S. Murty, P. Shankar, Baldev Raj, B. B. Rath and James Murday, "Text book of nanoscience and nanotechnology", Universities Press-IIM Series in Metallurgy and Materials Science, 2018.
2. T. Pradeep, "Nano: The Essentials: Understanding Nano science and Nano technology", (2008) Tata McGraw-Hill Publishing Company Limited, New Delhi.
3. B.R.Puri, L.R.Sharma, M.S.Pathania.,"Principles of Physical Chemistry", Vishal Publishing Company, 2008.
4. O.V. Roussak and H.D. Gesser, Applied Chemistry-A Text Book for Engineers and Technologists, Springer Science Business Media, New York, 2nd Edition, 2013.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	2	2	2		1		2			1		
2	2	1	1	1		2		1			1		
3	3	1	1	1		1		1			1		
4	3	1	1	1		2		1			1		
5	3	1	2	1		2		2			2		
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BoS Chairman / HoD (S&H)

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24GE3171 **PROGRAMMING IN C LABORATORY**

L	T	P	C
0	0	4	2

COURSE OBJECTIVES:

1. To familiarize with C programming constructs
2. To develop programs in C using basic constructs.
3. To develop programs in C using arrays.
4. To develop applications in C using strings, pointers, functions.
5. To develop applications in C using structures.
6. To develop applications in C using file processing.

LIST OF EXPERIMENTS:

1. I/O statements, operators, expressions
2. decision-making constructs: if-else, goto, switch-case, break-continue
3. Loops: for, while, do-while
4. Arrays: 1D and 2D
5. Strings: operations
6. Functions: call, return, passing parameters by (value, reference)
7. Recursion
8. Pointers: Pointers to functions, Pointers to Pointers
9. Structures: Nested Structures, Arrays of Structures
10. Files: reading and writing, file operations.

TOTAL:60 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Demonstrate knowledge on C programming constructs.
CO2 Develop programs in C using basic constructs
CO3 Develop programs in C using arrays.
CO4 Develop applications in C using strings, pointers, functions
CO5 Develop applications in C using structures.
CO6 Develop applications in C using file processing.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	1	3	3	1	1	1		2	1	2	2	2	2
2	2	3	3	2	1	1		2	1	2	2	2	3
3	2	2	2	1	1	2		2		2	2	2	2
4	2	2	2	2	1	2		3		3	3	3	2
5	2	2	3	2	3	2		3		3	3	3	3
6	2	2	3	2	1	2		2	1	2	2	2	2

Low (1) ; Medium (2) ; High (3)

COURSE COORDINATOR

BOS CHAIRMAN / HOD

24GE3071	ENGINEERING PRACTICES LABORATORY	L	T	P	C
		0	0	4	2

COURSE OBJECTIVES:

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

PART I **GROUP – A (CIVIL & ELECTRICAL)**

CIVIL ENGINEERING PRACTICES **15**

PLUMBING WORK:

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

WOOD WORK:

1. Sawing,
2. Planing and
3. Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.

PART II **ELECTRICAL ENGINEERING PRACTICES** **15**

1. Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin socket
2. Staircase wiring
3. Fluorescent Lamp wiring with introduction to CFL and LED types.
4. Energy meter wiring and related calculations/ calibration
5. Study of Iron Box wiring and assembly
6. Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac)
7. Study of emergency lamp wiring/Water heater

GROUP – B (MECHANICAL AND ELECTRONICS)

PART III **MECHANICAL ENGINEERING PRACTICES** **15**

WELDING WORK:

1. Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.
2. Practicing gas welding.

BASIC MACHINING WORK:

1. (simple)Turning.
2. (simple)Drilling.

3. (simple)Tapping.

SHEET METAL WORK:

1. Making of a square tray

PART IV ELECTRONIC ENGINEERING PRACTICES 15

SOLDERING WORK:

1. Soldering simple electronic circuits and checking continuity.

ELECTRONIC ASSEMBLY AND TESTING WORK:

1. Assembling and testing electronic components on a small PCB.

ELECTRONIC EQUIPMENT STUDY:

1. Study an element of smart phone.
2. Assembly and dismantle of LED TV.

TOTAL: 60 PERIODS

OUTCOMES:

At the end of the course the students will be able to

CO1 Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.

CO2 Wire various electrical joints in common household electrical wire work.

CO3 Weld various joints in steel plates using arc welding work;.

CO4 Machine various simple processes like turning, drilling, tapping in parts; Make a tray out of metal sheet using sheet metal work.

CO5 Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	2	2		2					1	2	2	
2	3	2	2		2					1	2	2	
3	3	2	2		2					1	2	2	
4	3	2	2		2					1	2	2	
5	3	2	2		2					1	2	2	
Low (1) ; Medium (2) ; High (3)													

M. Chauk
Course Coordinator

BoS Chairman/HoD

Chairman - Board of Studies
Department Of Mechanical Engineering
Sri Ranganathar Institute of Engineering and Technology
Coimbatore - 641 110.

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24ES3151	BASIC COMPUTING SKILLS FOR ENGINEERS	L	T	P	C
		0	0	2	1

COURSE OBJECTIVES:

1. Create and edit documents, spreadsheets, and presentations using MS Office.
2. Use advanced features like mail merge, data forms, and subtotalling in MS Excel
3. Design professional slides and presentations using MS PowerPoint.
4. Apply data analysis and visualization techniques using charts and graphs.
5. Use internet resources effectively and safely.

UNIT -I MS OFFICE **7**

Creating, editing, saving and printing text documents - Font and paragraph formatting - Simple character formatting - Inserting tables, smart art, page breaks - Using lists and styles - Working with images - Using Spelling and Grammar check - Understanding document properties - Mail Merge.

UNIT – II MS EXCEL **7**

Spreadsheet basics - Creating, editing, saving and printing spreadsheets - Working with functions & formulas - Modifying worksheets with color & autoformats - Graphically representing data : Charts & Graphs - Speeding data entry : Using Data Forms - Analyzing data : Data Menu, Subtotal, Filtering Data- Formatting worksheets - Securing & Protecting spreadsheets.

UNIT – III MS POWER POINT **8**

Opening, viewing, creating, and printing slides - Applying auto layouts Adding custom animation - Using slide transitions - Graphically representing data : Charts & Graphs - Creating Professional Slide for Presentation.

UNIT -IV INTERNET **8**

Understanding how to search/Google - bookmarking and Going to a specific website - Copy and paste Internet content into your word file and emails - Understanding social media platforms such as Facebook & Many more - learn with best practices.

TOTAL: 30 PERIODS

COURSE OUTCOMES

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

CO1	To create, edit, and format professional documents using MS Word.
CO2	To design, create, and manage spreadsheets using MS Excel for data analysis.
CO3	To create engaging presentations using MS PowerPoint with multimedia elements.
CO4	To effectively use internet resources, apply online safety practices, and leverage social media.

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	2				3							3	
2	3	2	2	2	3							3	2
3			2		3							3	
4					3	2						3	

Low (1) ; Medium (2) ; High (3)

COURSE COORDINATOR

BOS CHAIRMAN/ HOD

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24GE3172	SOFT SKILLS I	L	T	P	C
		0	0	2	1

COURSE OBJECTIVES:

1. To build verbal competence by improving skills in verbal analogy, sentence structuring, error spotting, and contextual language use.
2. To develop effective listening and communication strategies by overcoming barriers and applying the principles of the 7C's of communication.
3. To enhance interpersonal skills through training in group decision-making, negotiation, and paralanguage for professional settings.
4. To foster personal and professional development through self-grooming, SWOT analysis, and effective communication etiquette.

UNIT I VERBAL COMPETENCE **10**

1. Verbal Analogy
2. Cloze Test
3. Corporate vocabulary

UNIT II EFFECTIVE COMMUNICATION **10**

1. Overcoming Communication Barriers
2. Body Language and its Etiquette
3. 7C's of Communication

UNIT III INTERPERSONAL SKILLS **10**

1. Group Decision Making
2. Negotiation Skills
3. Self-Grooming & SWOT analysis

TOTAL: 30 PERIODS

Course Coordinator

[D. Indumathi]
AP/Eng.

BoS Chairman / HoD (S&H)

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24HS3252	PROFESSIONAL ENGLISH	L	T	P	C
		2	0	0	2

COURSE OBJECTIVES:

1. Develop strategies and skills to augment their ability to read and comprehend engineering and technology texts.
2. Foster their ability to write convincing job applications and effective reports.
3. Develop their speaking skills to make technical presentations and participate in group discussions.
4. Strengthen their listening skill which will help them comprehend lectures and talks in their areas of specialization.

UNIT I APPLIED ENGLISH FOR TECHNICAL CONTEXTS 6

Listening: Listening to motivational speech-Speaking: Asking for and giving directions -Reading: Reading short technical texts from newspapers and magazines -Writing: Extended definitions, checklists, recommendation-Vocabulary Development: Technical vocabulary, abbreviations - Language Development: Mixed tenses

UNIT – II TECHNICAL DOCUMENTATION AND COMMUNICATION 6

Listening: Listening to TED talks-Speaking: Describing a process, narrating a story-Reading:Reading advertisements, summarizing -Writing: Interpreting charts, graphs, Formal Letters (Quotations, Clarification, Placing orders & Complaint letters)-Vocabulary-Development: Vocabulary used in formal letters/emails and reports -Language Development: British and American spelling, numerical adjectives.

UNIT – III INTEGRATED SKILLS FOR ACADEMIC ENGLISH PROFICIENCY 6

Listening: Listening to classroom lectures, commentaries Speaking: Oral presentations -Reading: User manuals, speed reading techniques-Writing: Process writing, Use of sequence words, Analytical essays and issue-based essays -Vocabulary Development: Sequence words, misspelled words-Language Development: Identifying different types of sentences

UNIT – IV JOB READINESS AND CAREER SKILLS 6

Listening: Listening to documentaries, listening to virtual interviews Speaking: Mock interview Reading: Reading for detailed comprehension Writing: Email writing, Job application- Résumé preparation, Vocabulary Development: Finding suitable synonyms, Paraphrasing Language Development: Clauses, If conditionals

UNIT – V REPORTS AND COLLABORATIVE SPEAKING 6

Listening: Listening to talks based on the profession -Speaking: Participating in a group discussion - Reading: Reading pictography-Writing: Writing reports- feasibility, Survey and Industrial reports -Vocabulary Development: one-word substitution-Language Development: Reported speech, Active and Passive voice, Impersonal passive

TOTAL: 30 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Develop listening skills effectively in both academic and professional settings.

CO2 Enhance speaking skills by engaging confidently in technical and professional discussions.

CO3 Practice and refine reading techniques to efficiently extract key information from academic and technical texts.

CO4 Gains expertise in writing various forms of academic and professional documents.

CO5 Expand corporate vocabulary and gain job readiness through career-oriented tasks.

TEXT BOOKS:

1. Tom Hutchinson and Alan Waters, English for Specific Purposes: A Learning-Centered Approach, Cambridge University Press, 2019.
2. Paul Emmerson, English for Careers: Business, Professional, and Technical English, Cambridge University Press, 2008.

REFERENCES:

1. Michael Swan, Practical English Usage, Oxford University Press, 2005.
2. Gerald J. Alred, Charles T. Brusaw, and Walter E. Oliu, The Handbook of Technical Writing, St. Martin's Press, 2018.
3. M. Ashraf Rizvi, Business Communication, Tata McGraw-Hill Education, 2010.
4. M. K. Murthy, English for Engineers and Technologists, Wiley, 2014.

CO's-PO's & PSO's MAPPING:

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	1	1	1	1	1	3	3	1	3		3		
2	1	1	1	1	1	3	3	1	3		3		
3	2	3	2	3	2	3	3	2	3	3	3		
4	2	3	2	3	2	3	3	2	3	3	3		
5	2	3	3	3		3	3	2	3		3		
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

[D. INDUMATHI]
AP/Eng.

BoS Chairman / HoD (S&H)

24MA3251 STATISTICS AND NUMERICAL METHODS

L	T	P	C
3	1	0	4

COURSE OBJECTIVES:

1. To provide the necessary basic concepts of a statistical hypothesis testing to understand problems occurring in engineering and technology.
2. To understand and apply statistical principles in designing experiments and analyzing data to draw meaningful conclusions.
3. To introduce the basic concepts of solving algebraic and transcendental equations.
4. To introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines.
5. To acquaint the knowledge of various techniques and methods of solving ordinary differential equations

UNIT – I TESTING OF HYPOTHESIS **9+3**

Sampling distributions - Tests for single mean, proportion and difference of means (Large and small samples) – Tests for single variance and equality of variances – Chi square test for goodness of fit – Independence of attributes.

UNIT – II DESIGN OF EXPERIMENTS **9+3**

One way and two way classifications - Completely randomized design – Randomized block design – Latin square design

UNIT – III SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS **9+3**

Solution of algebraic and transcendental equations - Fixed point iteration method – Newton Raphson method- Solution of linear system of equations - Gauss elimination method – Pivoting - Gauss Jordan method – Iterative methods of Gauss Jacobi and Gauss Seidel - Eigenvalues of a matrix by Power method for symmetric matrices.

UNIT – IV INTERPOLATION, NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION **9+3**

Lagrange's and Newton's divided difference interpolations – Newton's forward and backward difference interpolation – Approximation of derivatives using interpolation polynomials – Numerical single and double integrations using Trapezoidal and Simpson's 1/3 rules.

UNIT – V NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS **9+3**

Single step methods: Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first order differential equations - Multi step methods: Milne's predictor corrector method for solving first order differential equations.

TOTAL: 45+15 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Apply the concept of testing of hypothesis for small and large samples in real life problems.

CO2 Apply the basic concepts of classifications of design of experiments in the field of agriculture.

CO3 Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.

CO4 Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.

CO5 Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

TEXT BOOKS:

1. Grewal, B.S., and Grewal, J.S., "Numerical Methods in Engineering and Science", Khanna Publishers, 10th Edition, New Delhi, 2015.
2. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 8th Edition, 2015.

REFERENCES:

1. Burden, R.L and Faires, J.D, "Numerical Analysis", 9th Edition, Cengage Learning, 2016.
2. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2014.
3. Gerald. C.F. and Wheatley. P.O. "Applied Numerical Analysis" Pearson Education, Asia, New Delhi, 7th Edition, 2007.
4. Gupta S.C. and Kapoor V. K., "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi, 12th Edition, 2020.
5. Spiegel. M.R., Schiller. J. and Srinivasan. R.A., "Schaum's Outlines on Probability and Statistics ", Tata McGraw Hill Edition, 4th Edition, 2012.
6. Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", 9th Edition, Pearson Education, Asia, 2010.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	1	1				2		2	3		
2	3	3	1	1				2		2	3		
3	3	3	1	1				2		2	3		
4	3	3	1	1				2		2	3		
5	3	3	1	1				2		2	3		
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/ HoD(S&H)

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24GE3052	PROBLEM SOLVING AND PYTHON PROGRAMMING	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

1. To understand the basics of algorithmic problem solving.
2. To learn to solve problems using Python conditionals and loops.
3. To define Python functions and use function calls to solve problems.
4. To use Python data structures - lists, tuples, dictionaries to represent complex data.
5. To do input/output with files in Python.

UNIT I COMPUTATIONALTHINKING AND PROBLEM SOLVING 9

Fundamentals of Computing – Identification of Computational Problems -Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), simple strategies for developing algorithms (iteration, recursion) tower of Hanoi.

UNIT – II DATATYPE, EXPRESSIONS, CONDITIONS 9

Python interpreter and interactive mode, debugging; values and types: int, float, boolean, string and list; variables, expressions, statements, precedence of operators, comments, Conditionals: Boolean values and operators, conditional (if), alternative (if-else),chained conditional (if-elif-else)

UNIT – III CONTROL FLOW, FUNCTIONS, STRINGS 9

Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module.

UNIT – IV LISTS, TUPLES, DICTIONARIES 9

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: operations and methods, tuple assignment, Dictionaries: operations and methods; advanced list processing.

UNIT – V FILES, MODULES, PACKAGES AND LIBRARIES 9

Files and exceptions: text files, reading and writing files, command line arguments, errors and exceptions, handling exceptions, modules, packages; NumPy and Pandas-Introduction, data frames, data handling.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Develop algorithmic solutions to simple computational problems.
CO2 Develop and execute simple Python programs using condition.
CO3 Decompose a Python program into functions and execute simple program using functions.
CO4 Represent compound data using Python lists, tuples, dictionaries etc.
CO5 Read and write data from/to files in Python programs.

TEXT BOOKS:

1. Allen B. Downey, "Think Python: How to Think like a Computer Scientist", 2nd Edition, O'Reilly Publishers, 2016.
2. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited, 2017.

REFERENCES:

1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.
2. G Venkatesh and Madhavan Mukund, "Computational Thinking: A Primer for Programmers and Data Scientists", 1st Edition, Notion Press, 2021.
3. John VGuttag,"Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data", Third Edition, MIT Press, 2021
4. Eric Matthes, "Python Crash Course, A Hands - on Project Based Introduction to Programming", 2nd Edition, No Starch Press, 2019.

CO's-PO's & PSO's MAPPING

COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	3	3	2					2	2	3	3
2	3	3	3	3	2					2	2	3	
3	3	3		3	2					2		3	
4	2	2		2	2					1		3	
5	1	2			1					1		2	
Low (1) ; Medium (2) ; High (3)													

COURSE COORDINATOR

BOS CHAIRMAN / HOD

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24GE3051	ENGINEERING GRAPHICS	L	T	P	C
		2	2	0	4

COURSE OBJECTIVES:

1. Drawing engineering curves
2. Drawing of projection of lines and plane surfaces
3. Drawing projection of solids.
4. Drawing section of solids and development of solids
5. Drawing isometric and freehand sketch of simple objects.

UNIT I PLANE CURVES **12**

Basic Geometrical constructions, Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola by eccentricity method — Construction of cycloid — construction of involutes of square and circle — Drawing of tangents and normal to the above curves.

UNIT – II PROJECTION OF LINES AND PLANE SURFACE **12**

Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT – III PROJECTION OF SOLIDS **10**

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one of the principal planes and parallel to the other by rotating object method.

UNIT – IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES **12**

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other — obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids — Prisms, pyramids cylinders and cones

UNIT – V ISOMETRIC AND FREE HAND SKETCHING **14**

Principles of isometric projection — isometric scale - Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders. Visualization concepts and Free Hand sketching: Visualization principles —Representation of Three dimensional objects — Layout of views- Freehand sketching of multiple views from pictorial views of objects.

TOTAL: 60 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Draw basic geometrical constructions and draw various engineering curves such as conics (ellipse, parabola, hyperbola), cycloids, and involutes, including constructing tangents and normal to these curves.

CO2 Apply principles of orthographic projection to lines and plane surfaces in first angle projection, and determine true lengths and inclinations of lines and planes using the rotating line and rotating object methods.

CO3 Project simple solids with inclined axes using rotating object method.

CO4 Demonstrate proficiency in sectioning solids with inclined cutting planes and developing lateral surfaces of various solids, and also obtaining true shapes of sections and surface developments.

CO5 Draw isometric projections of simple and truncated solids using isometric scales and apply visualization principles to represent 3D objects accurately through freehand techniques.

TEXT BOOKS:

1. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 53rd Edition, 2019.
2. Natrajan K.V., "A Text Book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.
3. Parthasarathy, N. S. and Vela Murali, "Engineering Drawing", Oxford University Press, 2015

REFERENCES:

1. Basant Agarwal and Agarwal C.M.,"Engineering Drawing", McGraw Hill, 2nd Edition, 2019.
2. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore, 27th Edition, 2017.
3. Luzzader, Warren.J. and Duff, John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	2	2	1	1						2	1	3
2	3	3	2	1	1						2	1	3
3	3	2	2	1	1						2	1	3
4	3	3	2	1	1						2	1	3
5	3	2	3	1	1						2	2	3
Low (1) ; Medium (2) ; High (3)													

M. Chandra.
Course Coordinator

BoS Chairman/HoD

24EE3251	CIRCUIT THEORY	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

1. To introduce electric circuits and its analysis and key concepts to analyze and understand electrical circuits.
2. To impart knowledge on solving circuit equations using network theorems.
3. To educate on obtaining the transient response of circuits.
4. To introduce the phenomenon of resonance in coupled circuits.
5. To introduce Phasor diagrams and analysis of single & three phase circuits.

UNIT – I BASIC CIRCUIT ANALYSIS **9**

Fundamentals concepts of R, L and C Elements-Energy Sources- Ohm' s Law -Kirchhoff's Laws - DC Circuits - Resistors in series and parallel circuits - A.C Circuits - Average and RMS Value - Complex Impedance - Phasor diagram - Real and Reactive Power, Power Factor, Energy -Mesh current and node voltage methods of analysis D.C and A.C Circuits.

UNIT – II NETWORK REDUCTION AND THEOREMS FOR DC AND AC CIRCUITS **9**

Network reduction: voltage and current division, source transformation – star delta conversion. Theorems – Superposition, Thevenin's and Norton's Theorem – Maximum power transfer theorem –Reciprocity Theorem – Millman's theorem- Tellegen's Theorem (Statement only)

UNIT – III TRANSIENT RESPONSE ANALYSIS **9**

Introduction - Laplace transforms and inverse Laplace transforms- standard test signals -Transient response of simple RL, RC and RLC series and parallel circuits for DC excitation.

UNIT – IV RESONANCE AND COUPLED CIRCUITS **9**

Series and parallel resonance -frequency response - Quality factor and Bandwidth - Self and mutual inductance - Coefficient of coupling - Dot Rule-Analysis of coupled circuits - Single Tuned circuits.

UNIT – V THREE PHASE CIRCUITS **9**

Analysis of three phase 3-wire and 4-wire circuits with star and delta connected balanced and unbalanced loads - phasor diagram of voltages and currents - power measurement in three phase circuits using two wattmeter method.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Explain circuit's behavior using circuit laws and Apply mesh analysis/ nodal analysis / to determine behavior of the given DC and AC circuit.

CO2 Apply network theorems to determine behavior of the given DC and AC circuit.

CO3 Compute the transient response of first order and second order systems to step and sinusoidal input.

CO4 Explain the frequency response of series and parallel RLC circuits and the behavior of magnetically coupled circuits.

CO5 Compute power, line/ phase voltage and currents of the given three phase circuit.

TEXT BOOKS:

1. William H. HaytJr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis", McGraw Hill publishers, 9thedition, New Delhi, 2020.
2. Charles K. Alexander, Mathew N.O. Sadiku, "Fundamentals of Electric Circuits", Second Edition, McGraw Hill, 2019.
3. Allan H. Robbins, Wilhelm C. Miller, "Circuit Analysis Theory and Practice", Cengage Learning India, 2013.

REFERENCES:

1. Chakrabarti A, "Circuits Theory (Analysis and synthesis), Dhanpat Rai& Sons, New Delhi, 2020.
2. Joseph A. Edminister, Mahmood Nahvi, "Electric circuits", Schaum's series, McGraw-Hill, First Edition, 2019.
3. M E Van Valkenburg, "Network Analysis", Prentice-Hall of India Pvt Ltd, New Delhi, 2015.
4. Richard C. Dorf and James A. Svoboda, "Introduction to Electric Circuits", 7th Edition, John Wiley Sons, Inc. 2018.
5. Sudhakar A and Shyam Mohan SP, "Circuits and Networks Analysis and Synthesis", McGraHill, 2015.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	3	2	2	2	1				3	3	3
2	3	3	3	3	2	2	1				3	3	3
3	3	3	3	3	2	2	1				3	3	3
4	3	3	3	3	2	2	1				3	3	3
5	3	3	3	3	2	2	1				3	3	3
Low (1); Medium (2); High (3)													

Course Coordinator

BOS Chairman/HOD

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24GE3252 **தமிழர் தொழில்நுட்பம்** **L T P C**
1 0 0 1

COURSE OBJECTIVES:

1. பண்டைய தமிழரின் தொழில்நுட்பத் திறன்கள் பற்றி அறிதல்.
2. வழிபாட்டு கட்டிடக் கலையின் பரிணாம வளர்ச்சியை அறிதல்.
3. பண்டைய உற்பத்தி நுட்பங்களை மதிப்பீடு செய்தல்.
4. வேளாண்மை மற்றும் நீர்ப்பாசன முறைகளின் நவீன முன்னோடிகளைக் கண்டறிதல்.
5. தமிழில் அறிவியல் மற்றும் கணினி நுட்பங்களை அறிந்து பயன்படுத்து திறன் வளர்த்தல்.

அலகு I நெசவு மற்றும் பானை தொழில் நுட்பம் **3**

சங்க காலத்தில் நெசவுத் தொழில் – பானை தொழில் நுட்பம் - கருப்பு மற்றும் சிவப்புப் மட்பாண்டங்கள்.

அலகு – II வடிவமைப்பு மற்றும் கட்டுமான தொழில் நுட்பம் **3**

சங்க காலத்தில் வீட்டு வடிவமைப்புகள் - சங்க கால கட்டுமானப் பொருட்கள் - மாமல்லபுரத்தின் சிற்பங்கள் மற்றும் கோயில்கள் - சோழர்களின் பெரிய கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் - நாயக்கர் கால கோயில்கள் - செட்டி நாட்டு வீடுகள்.

அலகு– III உற்பத்தி தொழில்நுட்பம் **3**

கப்பல் கட்டும் கலை - இரும்புத் தொழில் - இரும்பு உருக்குதல் - செம்பு மற்றும் தங்க நாணயங்கள் - மணிகள் தயாரிக்கும் தொழில்கள் - கல் மணிகள் – கண்ணாடி மணிகள் - ஓடு மணிகள் - எலும்பு மணிகள்.

அலகு – IV வேளாண்மை மற்றும் நீர்ப்பாசன தொழில்நுட்பம் **3**

அணை, குளம், குளங்கள், மதகு, சோழர் கால குமிழி தூம்புவின் முக்கியத்துவம், கால்நடை பராமரிப்பு - விவசாயம் மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள் - கடல் பற்றிய அறிவு – மீன்பிடித்தல் - முத்து மற்றும் முத்துக்குளித்தல்.

அலகு -V அறிவியல் தமிழ மற்றும தமிழ்கணினி **3**

அறிவியல் தமிழ் வளர்ச்சி – தமிழ் கணினிமயமாக்கல் - தமிழில் இணையம் மற்றும் தகவல் தொடர்பு சாதனங்கள் -தமிழ் எழுதும் எழுத்துருக்கள் - தமிழில் தொழில்நுட்ப சொற்கள் - தமிழ் இணையக் கல்விக்கழகம்– தமிழ் மின் நூலகம்- மின் இதழ்கள்.

TOTAL: 15 PERIODS

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24GE3252	TAMILS AND TECHNOLOGY	L	T	P	C
		1	0	0	1

COURSE OBJECTIVES:

1. To understand the technological skills of the ancient Tamils.
2. To study the evolutionary development of temple architecture.
3. To evaluate ancient production techniques.
4. To identify the ancient precedents of modern agricultural and irrigation practices.
5. To develop the ability to understand and use scientific and computer technologies in Tamil.

UNIT I WEAVING AND CERAMIC TECHNOLOGY 3

Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.

UNIT – II DESIGN AND CONSTRUCTION TECHNOLOGY 3

Designing and Structural construction House & Designs in household materials during Sangam Age - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Chetti Nadu Houses,

UNIT – III MANUFACTURING TECHNOLOGY 3

. Art of Ship Building - Iron industry - Iron smelting,steel -Copper and goldCoins as source of history - Minting of Coins – Beads making-industries Stone beads -Glass beads - Terracotta beads - Shell beads/ bone beats.

UNIT – IV AGRICULTURE AND IRRIGATION TECHNOLOGY 3

Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving .

UNIT – V SCIENTIFIC TAMIL & TAMIL COMPUTING 3

Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Tamil Digital Library – Internet and Information Communication Devices in Tamil – Tamil Writing Fonts – Technical Terms in Tamil – Tamil Virtual Academy – Tamil E-Library.

பாடநூல் / TEXT BOOKS:

1. தமிழக வரலாறு மக்களும் பண்பாடும் கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்.
2. கணினித் தமிழ் -முனைவர் இல, சுந்தரம், (விகடன் பிரசுரம்).
3. கீழடி வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL-(in print)
6. Social Life of the Tamils The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).

பார்வை நூல் : REFERENCES:

1. The Contributions of the Tamils to Indian Culture (Dr.M. Valarmathi) (Published by: International Institute of Tamil Studies).
2. Keeladi - 'Sangam City Civilization on the banks of river Vaigai (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu) Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author).
3. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
4. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) - Reference Book.

Course Coordinator **BoS Chairman / HoD (S&H)**

NCC Credit Course Level 1*

24NX3251 **(ARMY WING) NCC Credit Course Level - I**

L	T	P	C
2	0	0	2

NCC GENERAL		**6**
NCC 1	Aims, Objectives & Organization of NCC	1
NCC 2	Incentives	2
NCC 3	Duties of NCC Cadet	1
NCC 4	NCC Camps: Types & Conduct	2
NATIONAL INTEGRATION AND AWARENESS		**4**
NI 1	National Integration: Importance & Necessity	1
NI 2	Factors Affecting National Integration	1
NI 3	Unity in Diversity & Role of NCC in Nation Building	1
NI 4	Threats to National Security	1
PERSONALITY DEVELOPMENT		**7**
PD 1	Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving	2
PD 2	Communication Skills	3
PD 3	Group Discussion: Stress & Emotions	2
LEADERSHIP		**5**
L 1	Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour 'Code	3
L 2	Case Studies: Shivaji, Jhasi Ki Rani	2
SOCIAL SERVICE AND COMMUNITY DEVELOPMENT		**8**
SS 1	Basics, Rural Development Programmes, NGOs, Contribution of Youth	3
SS 4	Protection of Children and Women Safety	1
SS 5	Road / Rail Travel Safety	1
SS 6	New Initiatives	2
SS 7	Cyber and Mobile Security Awareness	1

TOTAL : 30 PERIODS

COURSE COORDINATOR **BOS CHAIRMAN**

NCC Credit Course Level 1*

24NX3252	(NAVAL WING) NCC Credit Course Level - I	L	T	P	C
		2	0	0	2
NCC GENERAL					**6**
NCC 1	Aims, Objectives & Organization of NCC				1
NCC 2	Incentives				2
NCC 3	Duties of NCC Cadet				1
NCC 4	NCC Camps: Types & Conduct				2
NATIONAL INTEGRATION AND AWARENESS					**4**
NI 1	National Integration: Importance & Necessity				1
NI 2	Factors Affecting National Integration				1
NI 3	Unity in Diversity & Role of NCC in Nation Building				1
NI 4	Threats to National Security				1
PERSONALITY DEVELOPMENT					**7**
PD 1	Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem-Solving				2
PD 2	Communication Skills				3
PD 3	Group Discussion: Stress & Emotions				2
LEADERSHIP					**5**
L 1	Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code				3
L 2	Case Studies: Shivaji, Jhasi Ki Rani				2
SOCIAL SERVICE AND COMMUNITY DEVELOPMENT					**8**
SS 1	Basics, Rural Development Programmes, NGOs, Contribution of Youth				3
SS 4	Protection of Children and Women Safety				1
SS 5	Road / Rail Travel Safety				1
SS 6	New Initiatives				2
SS 7	Cyber and Mobile Security Awareness				1

TOTAL : 30 PERIODS

COURSE COORDINATOR

BOS CHAIRMAN

NCC Credit Course Level 1*

24NX3253	(AIR FORCE WING) NCC Credit Course Level - I	L	T	P	C
		2	0	0	2

NCC GENERAL		**6**
NCC 1	Aims, Objectives & Organization of NCC	1
NCC 2	Incentives	2
NCC 3	Duties of NCC Cadet	1
NCC 4	NCC Camps: Types & Conduct	2
NATIONAL INTEGRATION AND AWARENESS		**4**
NI 1	National Integration: Importance & Necessity	1
NI 2	Factors Affecting National Integration	1
NI 3	Unity in Diversity & Role of NCC in Nation Building	1
NI 4	Threats to National Security	1
PERSONALITY DEVELOPMENT		**7**
PD 1	Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving	2
PD 2	Communication Skills	3
PD 3	Group Discussion: Stress & Emotions	2
LEADERSHIP		**5**
L 1	Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code	3
L 2	Case Studies: Shivaji, Jhasi Ki Rani	2
SOCIAL SERVICE AND COMMUNITY DEVELOPMENT		**8**
SS 1	Basics, Rural Development Programmes, NGOs, Contribution of Youth	3
SS 4	Protection of Children and Women Safety	1
SS 5	Road / Rail Travel Safety	1
SS 6	New Initiatives	2
SS 7	Cyber and Mobile Security Awareness	1

TOTAL : 30 PERIODS

COURSE COORDINATOR

BOS CHAIRMAN

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24PH3051	ENGINEERING PHYSICS	L	T	P	C
		3	0	2	4

COURSE OBJECTIVES:

1. To make the students effectively achieve an understanding the basics of Properties of Matter and i applications.
2. To introduce the basics of optics and lasers and its applications.
3. To enable the students to gain knowledge of fiber optic technology and its applications.
4. Equipping the students to successfully understand the importance of Thermal properties.
5. To inculcate an idea of significance of nano structures, quantum confinement and ensuing nano device applications.

UNIT I PROPERTIES OF MATTER 9

Elasticity - Stress-strain diagram and its uses - Factors affecting elastic modulus - Torsional stress and deformations - Torsional pendulum: theory and experiment.

Bending of beams - Bending moment - Cantilever: theory and experiment- Uniform and non-uniform bending: theory and experiment.

UNIT – II OPTICS AND LASERS 9

Optics: Reflection and refraction of light waves – Total internal reflection – Interference – Theory of Air-wedge experiment.

LASER: Principle of Spontaneous emission and stimulated emission. Population inversion, pumping methods- Einstein's A and B coefficients: derivation. Types of Lasers - Semiconductor Laser-homojunction and heterojunction - Industrial applications of Laser.

UNIT – III FIBER OPTIC TECHNOLOGY 9

Principle and propagation of light - Numerical aperture and Acceptance angle - Types of optical fibers (material, refractive index, mode) - Fiber optic communication System - Block diagram – Fiber optic sensors – temperature and displacement – Endoscope.

UNIT – IV THERMAL PHYSICS 9

Transfer of heat energy – thermal expansion of solids and liquids –bimetallic strips - thermal conduction, convection and radiation– thermal conductivity - Lee's disc method: (theory only) - conduction through compound media (series and parallel) – thermal insulation – applications: refrigerators, ovens and solar water heaters.

UNIT – V NANO DEVICES 9

Introduction - quantum confinement – quantum structures: quantum wells, wires and dots — band gap of nanomaterials. Tunneling – Single electron phenomena: Coulomb blockade – resonant tunneling diode – single electron transistor - Carbon nanotubes: Properties and applications - Optics in quantum structures – quantum well laser.

TOTAL: 45 PERIODS

LIST OF EXPERIMENTS (Any 5)

1. Determination of rigidity modulus of wire and moment of inertia of the disc -Torsional pendulum.
2. Determination of Young's modulus by uniform bending method.
3. Determination of Young's modulus by non-uniform bending method.

4. Simple harmonic oscillations of cantilever and Find young's modulus of the bar.
5. Determination of thickness of a thin wire by using travelling microscope – Air wedge method.
6. Determination of wavelength of the Laser using grating.
7. Determination of Numerical aperture and acceptance angle of an optical fiber.

TOTAL: 30 PERIODS

TOTAL : 45+30 = 75 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Understand the importance of properties of matter, elastic behaviour and Bending moment of materials.

CO2 Demonstrate a strong foundational knowledge in optics and laser, the thickness of the thin materials by using interference concept.

CO3 Express their knowledge in fiber optic technology.

CO4 Understand the importance of thermal properties of materials.

CO5 Understand the basics of quantum structures and their applications.

TEXT BOOKS:

1. Bhattacharya D K and Poonam Tandon, "Engineering Physics", 2nd edition, Oxford University Press, Chennai, 2017
2. Marikani A, "Engineering Physics", 3rd edition, PHI publishers, Chennai, 2021.
3. Parag K. Lala, Quantum Computing: A Beginner's Introduction, McGraw-Hill Education (Indian Edition), 2020.
4. Gaur, R.K. & Gupta, S.L. "Engineering Physics". Dhanpat Rai Publishers, 2012.

REFERENCES:

1. Charles Kittel, Introduction to Solid State Physics, Wiley India Edition, 2019
2. V. V.Mitin, V.A. Kochelap and M.A.Stroscio, Introduction to Nanoelectronics, Cambridge Univ.Press, 2008
3. G.W. Hanson, Fundamentals of Nanoelectronics, Pearson Education (Indian Edition) 2009.
4. Y.B.Band and Y.Avishai, Quantum Mechanics with Applications to Nanotechnology and Information Science, Academic Press, 2013.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	1	2										
2	3	1	2										
3	3	1	2										
4	3	1	1										
5	3	1	1										
Low (1) ; Medium (2) ; High (3)													

Course Coordinator **BoS Chairman / HoD (S&H)**

24EE3271	ELECTRIC CIRCUITS LABORATORY	L	T	P	C
		0	0	4	2

COURSE OBJECTIVES:

1. To simulate various electric circuits using Pspice/ Matlab/e-Sim /Scilab.
2. To gain practical experience on electric circuits and verification of theorems.

LIST OF EXPERIMENTS

Familiarization of various electrical components, sources and measuring instruments

1. Simulation and experimental verification of series and parallel electrical circuit using fundamental laws.
2. Simulation and experimental verification of electrical circuit problems using Thevenin's theorem.
3. Simulation and experimental verification of electrical circuit problems using Norton's theorem.
4. Simulation and experimental verification of electrical circuit problems using Superposition theorem.
5. Simulation and experimental verification of electrical circuit problems using Maximum Power transfer theorem.
6. Simulation and Experimental validation of R-L, R-C and RLC electric circuit transients.
7. Simulation and Experimental validation of frequency response of RLC electric circuit.
8. Design and implementation of series and parallel resonance circuit.
9. Simulation and experimental verification of three phase balanced and unbalanced star, delta networks circuit (Power and Power factor calculations).

TOTAL: 60 PERIODS

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 Use Simulation and Experimental methods to verify the fundamental electrical laws for the given DC/AC circuit (Ex 1).

CO2 Use simulation and experimental methods to verify the various electrical theorems (Superposition, Thevenin, Norton and maximum power transfer) for the given DC/AC Circuit (Ex 2-5).

CO3 Analyze the transient behavior of the given RL/RC/RLC circuit using simulation and experimental methods (Ex 6).

CO4 Analyze the frequency response of the given series and parallel RLC circuit using simulation and experimentation methods (Ex 7-8).

CO5 Analyze the performance of the given three-phase circuit using simulation and experimental methods (Ex 9).

TEXT BOOKS:

1. William H. HaytJr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis", McGraw Hill publishers, 9thedition, New Delhi, 2020.
2. Charles K. Alexander, Mathew N.O. Sadiku, "Fundamentals of Electric Circuits", Second Edition, McGraw Hill, 2019.
3. Allan H. Robbins, Wilhelm C. Miller, "Circuit Analysis Theory and Practice", Cengage Learning India, 2013.

REFERENCES:

1. Chakrabarti A, "Circuits Theory (Analysis and synthesis), Dhanpat Rai& Sons, New Delhi, 2020.
2. Joseph A. Edminister, Mahmood Nahvi, "Electric circuits", Schaum's series, McGraw-Hill, First Edition, 2019.
3. M E Van Valkenburg, "Network Analysis", Prentice-Hall of India Pvt Ltd, New Delhi, 2015.
4. Richard C. Dorf and James A. Svoboda, "Introduction to Electric Circuits", 7th Edition, John Wiley Sons, Inc. 2018.
5. Sudhakar A and Shyam Mohan SP, "Circuits and Networks Analysis and Synthesis", McGraHill, 2015.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	3	3	3	2	1.5	3			3	3	3
2	3	3	3	3	3	2	1.5	3			3	3	3
3	3	3	3	3	3	2	1.5	3			3	3	3
4	3	3	3	3	3	2	1.5	3			3	3	3
5	3	3	3	3	3	2	1.5	3			3	3	3
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/HOD

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24GE3072	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	L	T	P	C
		0	0	4	2

COURSE OBJECTIVES:

1. To understand the problem solving approaches.
2. To learn the basic programming constructs in Python.
3. To practice various computing strategies for Python-based solutions to real world problems.
4. To use Python data structures - lists, tuples, dictionaries.
5. To do input/output with files in Python.

LIST OF EXPERIMENTS:

1. Identification and solving of simple real life or scientific or technical problems, and developing flow charts for the same. (Electricity Billing, Retail shop billing, compute Electrical Current in Three Phase AC Circuit, etc.)
2. Python programming using simple statements and expressions (exchange the values of two variables, circulate the values of n variables, distance between two points).
3. Scientific problems using Conditionals and Iterative loops. (Number series, Number Patterns, pyramid pattern)
4. Implementing real-time/technical applications using Lists, Tuples. (Items present in a library/Components of a car/ Materials required for construction of a building – operations of list & tuples).
5. Implementing real-time/technical applications using Sets, Dictionaries. (Language, components of an automobile, Elements of a civil structure, etc.- operations of Sets & Dictionaries)
6. Implementing programs using Functions. (Factorial, largest number in a list, area of shape)
7. Implementing programs using Strings. (reverse, palindrome, character count)
8. Implementing programs using written modules and Python Standard Libraries pandas, numpy. Matplotlib)
9. Implementing real-time/technical applications using File handling. (copy from one file to another, word count, longest word)
10. Implementing real-time/technical applications using Exception handling. (divide by zero error, voter's age validity, student mark range validation).

TOTAL:60 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1	Develop algorithmic solutions to simple computational problems.
CO2	Develop and execute simple Python programs
CO3	Implement programs in Python using conditionals and loops for solving problems.
CO4	Deploy functions to decompose a Python program
CO5	Process compound data using Python data structures.

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	3	3	2					2	2	3	3
2	3	3	3	3	2					2	2	3	
3	3	3	3	3	2					2		3	
4	2	2		2	2					1		3	
5	1	2			1					1		2	
Low (1) ; Medium (2) ; High (3)													

COURSE COORDINATOR

BOS CHAIRMAN / HOD

24GE3272	SOFT SKILLS II	L	T	P	C
		0	0	2	1

COURSE OBJECTIVES:

1. To develop effective presentation skills through structured techniques, body language, and time management.
2. To enhance group discussion and public speaking abilities by fostering confidence, strategic thinking, and audience engagement.
3. To equip learners with essential interview skills, including preparation, etiquette, and handling various interview formats.
4. To improve professional communication and soft skills required for academic, corporate, and real-world scenarios.

UNIT I PRESENTATION SKILLS **10**

1. Presentation techniques
2. Virtual presentation
3. Public speaking

UNIT II GROUP DISCUSSION AND PUBLIC SPEAKING **10**

1. Introduction to Group Discussion
2. Group Discussion Strategies
3. Activities to improve GD skills

UNIT III INTERVIEW SKILLS **10**

1. Listening to Interviews
2. Interview Techniques and Etiquette
3. Online Interview Techniques

TOTAL: 30 PERIODS

Course Coordinator
(D. Indumathi)
AP/Eng.

BoS Chairman / HoD (S&H)

24MA3303 PROBABILITY AND COMPLEX FUNCTIONS

L	T	P	C
3	1	0	4

COURSE OBJECTIVES:

The objective of the course is:

1. To introduce the basic concepts of probability and random variables.
2. To introduce the basic concepts of two-dimensional random variables.
3. To acquaint the student with the concepts of vector calculus needed for problems in engineering discipline.
4. To develop an understanding of the standard techniques of complex variable theory in particular analytic function and its mapping property.
5. To familiarize the students with complex integration techniques and contour integration techniques which can be used in real integrals.

UNIT I PROBABILITY AND RANDOM VARIABLES 9+3

Axioms of probability – Conditional probability – Baye's theorem - Discrete and continuous random variables – Moments – Moment generating functions – Binomial, Poisson, Geometric, Uniform, Exponential and Normal distributions – Functions of a random variable.

UNIT – II TWO- DIMENSIONAL RANDOM VARIABLES 9+3

Joint distributions – Marginal and conditional distributions – Covariance – Correlation and linear regression – Transformation of random variables – Central limit theorem (for independent and identically distributed random variables).

UNIT – III VECTOR CALCULUS 9+3

Gradient, divergence and curl – Directional derivative – Irrotational and solenoidal vector fields – Vector integration – Green's theorem in a plane, Gauss divergence theorem and Stokes' theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelopipeds.

UNIT – IV ANALYTIC FUNCTIONS 9+3

Analytic functions – Necessary and sufficient conditions for analyticity in Cartesian and Polar coordinates – properties – Harmonic conjugates – Construction of analytic function – Conformal mapping: $w = z+k$, kz, $1/z$, z^2, e^z and bilinear transformation

UNIT – V COMPLEX INTEGRATION 9+3

Line integral - Cauchy's integral theorem – Cauchy's integral formula – Taylor's and Laurent's series – Singularities – Residues – Residue theorem – Application of residue theorem for evaluation of real integrals – Applications of circular contour and semicircular contour (with poles NOT on real axis).

TOTAL: 45+15 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.

CO2 Understand the basic concepts of one- and two-dimensional random variables and apply in engineering applications.

CO3 Apply vector calculus concepts, including gradient, divergence, and curl, to solve problems involving vector integration.

CO4 To develop an understanding of the standard techniques of complex variable theory in particular analytic function and its mapping property

CO5 To familiarize the students with complex integration techniques and contour integration techniques which can be used in real integrals

TEXT BOOKS:

1. Johnson. R.A., Miller. I and Freund. J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 9th Edition, 2016.
2. Milton. J. S. and Arnold. J.C., "Introduction to Probability and Statistics", Tata McGraw Hill, 4th Edition, 2007
3. Grewal.B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition,

REFERENCES:

1. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2014.
2. Papoulis. A. and Unnikrishnapillai . S., "Probability, Random Variables and Stochastic Processes", McGraw Hill Education India, 4th Edition, New Delhi, 2010.
3. Ross.S.M.,"Introduction to Probability and Statistics for Engineers and Scientists",5th Edition, Elsevier, 2014.
4. Spiegel. M.R., Schiller. J. and Srinivasan. R.A., "Schaum's Outline of Theory and Problems of Probability and Statistics", Tata McGraw Hill Edition, 4th Edition, 2012.
5. Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", Pearson Education, Asia, 9th Edition, 2010.
6. Kreyszig.E, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2016.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3						2			2		
2	3	3						2			2		
3	3	3						2			2		
4	3	3						2			2		
5	3	3						2			2		
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/ HoD(S&H)

24EE3301	ELECTROMAGNETIC THEORY	L	T	P	C
		3	1	0	4

COURSE OBJECTIVES:

1. To introduce the basic mathematical concepts related to electromagnetic vector fields.
2. To impart knowledge on the concepts of electrostatic fields, electric potential, energy density and their applications.
3. To impart knowledge on the concepts of magneto static fields, magnetic flux density, vector potential and its applications.
4. To impart knowledge on the concepts of different methods of emf generation and Maxwell's equation.
5. To impart knowledge on the concepts of electromagnetic waves and characterizing parameters.

UNIT – I ELECTROSTATICS - I **12**

Sources and effects of electromagnetic fields – Coordinate Systems -Vector fields - Gradient Divergence, curl – theorems and applications- Coulomb's Law- Electric field intensity- Field due to discrete and continuous charges- Gauss's Law and applications.

UNIT – II ELECTROSTATICS - II **12**

Electric potential – Electric field and equipotential plots, Uniform and Non-uniform field, Utilization factor – Electric field in free space, conductors, dielectrics – Dielectric polarization – Dielectric strength – Electric field in multiple dielectrics – Boundary conditions, Poisson's and Laplace's equations, Capacitance, Energy density, Applications

UNIT – III MAGNETOSTATICS **12**

Lorentz force, magnetic field intensity(H) – Biot-Savart's Law – Ampere's Circuit Law – H due to straight conductors, circular loop, infinite sheet of current, Magnetic flux density(B) - B in free space, conductor, magnetic materials – Magnetization, Magnetic field in multiple media – Boundary conditions, Scalar and vector potential, Poisson's Equation, Magnetic force, Torque, Inductance, Energy density, Applications.

UNIT – IV ELECTRODYNAMIC FIELDS **12**

Magnetic circuits – Faraday's law – Transformer and motional EMF – Displacement current – Maxwell's equations (differential and integral form) – Relation between field theory and circuit theory – Applications.

UNIT – V ELECTROMAGNETIC WAVES **12**

Electromagnetic wave generation and equations – Wave parameters; velocity, intrinsic impedance, propagation constant – Waves in free space, lossy and lossless dielectrics, conductors – Skin depth– Poynting vector.

TOTAL: 60 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Visualize and explain Gradient, divergence and Curl operations on electromagnetic vector fields and identify the electromagnetic sources and their effects.

CO2 Compute and analyse electrostatic fields, electric potential, energy density along with their applications.

CO3 Compute and analyse magneto static fields, magnetic flux density, vector potential, along with their applications.

CO4 Explain different methods of emf generation and Maxwell's equation.

CO5 Explain the concepts of electromagnetic waves and characterizing parameters.

TEXT BOOKS:

1. Mathew N. O. Sadiku, S.V. Kulkarni 'Principles of Electromagnetics', 6th Edition, Oxford University Press Inc. Asian edition, 2015.
2. William H. Hayt and John A. Buck, 'Engineering Electromagnetics', McGraw Hill Special Indian edition, 2014.
3. Kraus and Fleish, 'Electromagnetics with Applications', McMcGraw Hill International Editions, Fifth Edition, 2010.

REFERENCES:

1. V.V.Sarwate, 'Electromagnetic fields and waves', Second Edition, Newage Publishers, 2018.
2. J.P.Tewari, 'Engineering Electromagnetics - Theory, Problems and Applications', Second Edition, Khanna Publishers 2013.
3. Joseph.A.Edminister, 'Schaum's Outline of Electromagnetics, Fifth Edition (Schaum's Outline Series), McGraw Hill, 2018.
4. S.P.Ghosh, Lipika Datta, 'Electromagnetic Field Theory', First Edition, McGraw Hill Education(India) Private Limited, 2017.
5. K A Gangadhar, 'Electromagnetic Field Theory', Khanna Publishers; Sixteenth Edition Eighth Reprint :2015

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	2					3	1	2			1	3
2	3	2	1	2			1	1	2			1	3
3	3	2	1	2			1	1	2			1	3
4	3	2	1	2			1	1	2			1	3
5	3	2	1	2			1	1	2			1	3
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/HOD

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24EE3302 DC MACHINES AND TRANSFORMERS

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. To understand the concept of electromechanical energy conversion system.
2. To identify the appropriate machine for a given application based on its characteristics.
3. To identify the appropriate test to determine the performance parameters of a given machine.
4. To familiarize with the procedure for parallel operation of generators and transformers.
5. To deliberate the working of auto transformer and three phase transformers.

UNIT – I ELECTROMECHANICAL ENERGY CONVERSION 9

Fundamentals of Magnetic circuits- Statically and dynamically induced EMF - Principle of electromechanical energy conversion forces and torque in magnetic field systems- energy balance in magnetic circuits- magnetic force- co-energy in singly excited and multi excited magnetic field system mmf of distributed windings – Winding Inductances-, magnetic fields in rotating machines- magnetic saturation and leakage fluxes. Introduction to Indian Standard Specifications (ISS) - Role.

UNIT – II DC GENERATORS 9

Principle of operation, constructional details, armature windings and its types, EMF equation, wave shape of induced emf, armature reaction, demagnetizing and cross magnetizing Ampere turns, compensating winding, commutation, methods of improving commutation, interpoles, OCC and load characteristics of different types of DC Generators. Parallel operation of DC Generators, equalizing connections- applications of DC Generators.

UNIT – III DC MOTORS 9

Principle of operation, significance of back emf, torque equations and power developed by armature, speed control of DC motors, starting methods of DC motors, load characteristics of DC motors, losses and efficiency in DC machine, condition for maximum efficiency. Testing of DC Machines: Brake test, Swinburne's test, Hopkinson's test, Field test, Retardation test, Separation of core losses-applications of DC motors.

UNIT – IV SINGLE PHASE TRANSFORMER 9

Construction and principle of operation, equivalent circuit, phasor diagrams, testing - polarity test, open circuit and short circuit tests, voltage regulation, losses and efficiency, all day efficiency, back-to back test, separation of core losses, parallel operation of single-phase transformers, applications of single-phase transformer.

UNIT – V AUTO TRANSFORMER AND THREE PHASE TRANSFORMER 9

Construction and working of auto transformer, comparison with two winding transformers, applications of autotransformer. Three Phase Transformer- Construction, types of connections and their comparative features, Scott connection, applications of Scott connection.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Apply the laws governing the electromechanical energy conversion for singly and multiple excited systems.

CO2 Explain the construction, working and Characteristics principle of DC machines.

CO3 Compute various performance parameters of the machine, by conducting suitable tests.

CO4 Draw the equivalent circuit of transformer and predetermine the efficiency and regulation.

CO5 Describe the working principle of auto transformer, three phase transformer with different types of connections.

TEXT BOOKS:

1. I. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education, 5th Edition, 2017.
2. P. S. Bimbhra, "Electric Machinery", Khanna Publishers, 2nd Edition, 2021.

REFERENCES:

1. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", New York, McGraw Hill Education, 6th Edition 2017.
2. A. E. Clayton and N. N. Hancock, "Performance and design of DC machines", CBS Publishers, 2018.
3. M. G. Say, "Performance and design of AC machines", CBS Publishers, First Edition 2008.
4. Sahdev S. K. "Electrical Machines", Cambridge University Press, 2018.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	1	1	1			1				1	3
2	3	3	1	1	1			1				1	3
3	3	3	1	1	1			1				1	3
4	3	3	1	1	1			1				1	3
5	3	3	1	1	1			1				1	3
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/HOD

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24EE3303 MEASUREMENTS AND INSTRUMENTATIONS

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. To educate the fundamental concepts and characteristics of measurement and errors.
2. To impart the knowledge on the functional aspects of measuring instruments.
3. To infer the importance of various bridge circuits used with measuring instruments.
4. To educate the fundamental working of sensors and transducers and their applications.
5. To summarize the overall measurement and instrumentation with the knowledge on digital instrumentation principles.

UNIT – I CONCEPTS AND MEASUREMENTS **9**

Instruments: classification, applications - Elements of a generalized measurement system - Static and dynamic characteristics - Errors in measurement -Statistical evaluation of measurement data.

UNIT – II MEASUREMENT OF PARAMETERS IN ELECTRICAL SYSTEMS **9**

Classification of instruments - moving coil and moving iron meters - Induction type, dynamometer type watt meters - Energy meter - Megger - Instrument transformers (CT & PT).

UNIT – III AC/DC BRIDGES AND INSTRUMENTATION AMPLIFIERS **9**

Wheatstone bridge, Kelvin double bridge - Maxwell, Hay, Wien and Schering bridges - Errors and compensation in A.C. bridges - Instrumentation Amplifiers.

UNIT – IV TRANSDUCERS FOR MEASUREMENT OF NON- ELECTRICAL PARAMETERS **9**

Classification of transducers - Measurement of pressure, temperature, displacement, flow, angular velocity - Digital transducers - Smart Sensors.

UNIT – V DIGITAL INSTRUMENTATION **9**

A/D converters: types and characteristics - Sampling, Errors- Measurement of voltage, Current, frequency and phase - D/A converters: types and characteristics- DSO- Data Loggers - Basics of PLC programming and Introduction to Virtual Instrumentation - Instrument standards.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Ability to understand the fundamental art of measurement in engineering.
CO2 Ability to understand the structural elements of various instruments.
CO3 Ability to understand the importance of bridge circuits.
CO4 Ability to understand about various transducers and their characteristics by experiments.
CO5 Ability to understand the concept of digital instrumentation and virtual instrumentation by experiments.

TEXT BOOKS:

1. A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, New Delhi, Edition 2011.
2. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw-Hill, New Delhi, 2010

REFERENCES:

1. M.M.S. Anand, 'Electronics Instruments and Instrumentation Technology', Prentice Hall India, New Delhi, 2009.
2. J.J. Carr, 'Elements of Electronic Instrumentation and Measurement', Pearson Education India, New Delhi, 2011.
3. W.Bolton, Programmable Logic Controllers, 6th Edition, Elseiver, 2015.
4. R.B. Northrop, 'Introduction to Instrumentation and Measurements', Taylor & Francis, New Delhi, 3rd Edition 2014.
5. E. O. Doebelin and D. N. Manik, "Measurement Systems – Application and Design", Tata McGraw-Hill, New Delhi, 6th Edition 2017.
6. R. K. Rajput, "Electrical and Electronics Measurements and Instrumentation", Chand Pub, 2016.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	2	3		3		2		3		3	3	3
2	3	2	3	2							3	3	3
3	3	2	3		3		2				3	3	3
4	3	2	3						3			3	3
5	3	2	3	2	3		2		3		3	3	3
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/HOD

24EE3304	ELECTRON DEVICES AND CIRCUITS	L	T	P	C
		3	0	2	4

COURSE OBJECTIVES:

1. To understand the structure of basic electronic devices.
2. To familiarize the operation and applications of transistor like BJT and FET.
3. To explore the characteristics of amplifier, gain and frequency response.
4. To know about cascaded amplifier operation in various modes.
5. To learn the required functionality of positive and negative feedback systems.

UNIT – I DIODES AND APPLICATIONS **9**

PN junction diode –structure, operation and V-I characteristics, diffusion and transition capacitance – Clipping & Clamping circuits - Rectifiers – Half Wave and Full Wave Rectifier– Display devices-LED, Laser diodes, Zener diode characteristics- Zener diode Reverse characteristics – Zener diode as regulator.

UNIT – II TRANSISTORS AND THYRISTORS **9**

BJT, JFET, MOSFET- structure, operation, characteristics and Biasing UJT, Thyristors and IGBT - Structure and characteristics.

UNIT – III ANALYSIS OF AMPLIFIERS **9**

BJT small signal model – Analysis of CE, CB, CC amplifiers- MOSFET small signal model– Analysis of CS and Source follower – Gain and frequency response.

UNIT – IV MULTISTAGE AMPLIFIERS AND DIFFERENTIAL AMPLIFIER **9**

BIMOS cascade amplifier, Differential amplifier – Common mode and Difference mode analysis – FET input stages – Single tuned amplifiers – Gain and frequency response – Neutralization methods.

UNIT – V FEEDBACK TECHNIQUES AND OSCILLATORS **9**

Advantages of negative feedback – voltage / current, series, Shunt feedback –positive feedback – Condition for oscillations, phase shift – Wien bridge, Hartley, Colpitts and Crystal oscillators.

TOTAL: 45 PERIODS

LIST OF EXPERIMENTS

1. Characteristics of Semiconductor diode, & Zener diode.
2. Characteristics of NPN Transistor under common emitter, common collector and common base configurations.
3. Characteristics of JFET and draw the equivalent circuit.
4. Characteristics of UJT and generation of saw tooth waveforms.
5. Characteristics of light activated relay circuit.
6. Design and testing of RC phase shift and LC oscillators.
7. Characteristics of Single-Phase half-wave and full wave rectifiers with inductive and capacitive filters.

TOTAL: 30 PERIODS

TOTAL: 45+30= 75 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Understand the structure and operation of PN junction devices (diode, Zener diode, LED, and Laser diode) and their applications.

CO2 Analyze the structure and characteristics of BJT, FET, MOSFET, UJT, Thyristor, and IGBT

CO3 Analyze the performance of various configurations of BJT and MOSFET-based amplifiers

CO4 Explain the characteristics of MOS-based cascade and differential amplifier

CO5 Explain the operation of various feedback amplifiers and oscillators

TEXT BOOKS:

1. David A. Bell," Electronic devices and circuits", Oxford University higher education, 5th edition 2010.
2. J. B. Gupta," Electronic Devices and Circuits" S.K. Kataria & Sons, 6th Edition 2016.
3. Sedra and Smith, "Microelectronic circuits",7th Ed., Oxford University Press.
4. Robert L. Boylestad and Louis Nasheresky, "Electronic Devices and Circuit Theory", 10th Edition, Pearson Education / PHI, 2008.
5. Adel .S. Sedra, Kenneth C. Smith, "Micro Electronic Circuits", Oxford University Press, 7 th Edition, 2014.

REFERENCES:

1. Anil K.Maini, Varsha Agarwal," ELECTRONIC DEVICES AND CIRCUITS" Wiley, 2nd Edition-2024.
2. Rivera D," CONCEPTS OF ELECTRONIC DEVICES AND CIRCUITS" American Academic Publisher (Exclusive),1 January 2023.
3. Balbir Kumar, Shail.B.Jain, "Electronic devices and circuits" PHI learning private limited, 2nd edition, 2014.
4. Thomas L.Floyd, "Electronic devices", Conventional current version, Pearson Prentice Hall, 10th Edition, 2017.
5. Robert L. Boylestad, "Electronic devices and circuit theory", 11th edition, Pearson Prentice Hall, 2013.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	2	2	3	2	2			1				1	3
2	2	2	3	2	2			1				1	3
3	3	3	3	2	2			1				1	3
4	2	2	3	2	2			1				1	3
5	2	2	3	2	2			1				1	3
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/HOD

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24CS3303	DATA STRUCTURES USING C	L	T	P	C
		3	0	2	4

COURSE OBJECTIVES:

1. To introduce the basics of C programming language.
2. To learn the concepts of advanced features of C.
3. To understand the concepts of ADTs and linear data structures.
4. To know the concepts of non-linear data structure and hashing.
5. To familiarize the concepts of sorting and searching techniques.

UNIT I C PROGRAMMING FUNDAMENTALS **9**

Data Types – Variables – Operations – Expressions and Statements – Conditional Statements – Functions – Recursive Functions – Arrays – Single and Multi-Dimensional Arrays.

UNIT – II C PROGRAMMING - ADVANCED FEATURES **9**

Structures – Union – Enumerated Data Types – Pointers: Pointers to Variables, Arrays and Functions – File Handling – Preprocessor Directives.

UNIT – III LINEAR DATA STRUCTURES **9**

Abstract Data Types (ADTs) – List ADT – Array-Based Implementation – Linked List – Doubly-Linked Lists – Circular Linked List – Stack ADT – Implementation of Stack – Applications – Queue ADT – Priority Queues – Queue Implementation – Applications.

UNIT IV NON-LINEAR DATA STRUCTURES **9**

Trees – Binary Trees – Tree Traversals – Expression Trees – Binary Search Tree – Hashing - Hash Functions – Separate Chaining – Open Addressing – Linear Probing– Quadratic Probing – Double Hashing – Rehashing.

UNIT V SORTING AND SEARCHING TECHNIQUES **9**

Insertion Sort – Quick Sort – Heap Sort – Merge Sort –Linear Search – Binary Search.

TOTAL: 45 PERIODS

PRACTICALS

1. Practice of C programming using statements and expressions, decision making and iterative statements.
2. Practice of C programming using Functions and Arrays.
3. Implement C programs using Pointers and Structures.
4. Implement C programs using Files.
5. Applications of List, Stack and Queue ADTs.
6. Implementation of Binary Trees and operations of Binary Trees.

7. Implementation of Binary Search Trees.
8. Implementation of Sorting algorithms: Insertion Sort, Quick Sort, Merge Sort.

PRACTICALS: 30 PERIODS

TOTAL: 45+30= 75 PERIODS

COURSE OUTCOMES

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

CO1	Develop C programs for any real world/technical application.
CO2	Apply advanced features of C in solving problems.
CO3	Write functions to implement linear and non–linear data structure operations.
CO4	Suggest and use appropriate linear/non–linear data structure operations for solving a given problem.
CO5	Appropriately use sort and search algorithms for a given application.

TEXT BOOKS

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education, 2014.
2. Reema Thareja, "Programming in C", 2nd Edition, Oxford University Press, 2016.

REFERENCE BOOK

1. Brian W. Kernighan, Rob Pike, "The Practice of Programming", Pearson Education, 2010.
2. Paul J. Deitel, Harvey Deitel, "C How to Program", 7th Edition, Pearson Education, 2013.
3. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, "Data Structures and Algorithms", PearsonEducation, 2014.
4. Ellis Horowitz, SartajSahni and Susan Anderson, "Fundamentals of Data Structures", Galgotia, 2008.

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

CO's-PO's & PSO's MAPPING

CO	PO											PSO	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	2	3	1	2	2	1		1	2	1	3	2	1
2	1	2	1	2	2			1	1	1	2	2	2
3	2	3	1	2	3			1	1	1	2	2	1
4	2	1		1	1			2	1	1	2	2	3
5	1	2	1	2	2	1		1	2	1	3	2	2
Low (1) ; Medium (2) ; High (3)													

COURSE COORDINATOR

BOS CHAIRMAN/HOD

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24EE3311	DC MACHINES AND TRANSFORMERS LABORATORY	L	T	P	C
		0	0	3	1.5

COURSE OBJECTIVES:

1. To expose the students to determine the characteristics of DC machines and transformers by performing experiments on these machines.
2. To provide hands on experience to evaluate the performance parameters of DC machines and transformer by conducting suitable tests.

LIST OF EXPERIMENTS

1. Open circuit and load characteristics of DC shunt generator- calculation of critical resistance and critical speed.
2. Load characteristics of DC compound generator with differential and cumulative connections.
3. Load test on DC shunt motor.
4. Load test on DC compound motor.
5. Load test on DC series motor.
6. Swinburne's test and speed control of DC shunt motor.
7. Hopkinson's test on DC motor – generator set.
8. Load test on single-phase transformer and three phase transformers.
9. Open circuit and short circuit tests on single phase transformer.
10. Sumpner's test on single phase transformers.
11. Separation of no-load losses in single phase transformer.
12. Study of starters and 3-phase transformers connections.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the students will be able to

CO1 Construct the circuit with appropriate connections for the given DC machine/transformer.
CO2 Experimentally determine the characteristics of different types of DC machines.
CO3 Demonstrate the speed control techniques for a DC motor for industrial applications.
CO4 Identify suitable methods for testing of transformer and DC machines and Performance Parameters.
CO5 Understand DC motor starters and 3-phase transformer connections.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	1	1				1				3	1
2	3	3	1	1				1				3	3
3	3	3	1	1				1				3	3
4	3	3	1	1				1				2	3
5	3	3	1	1				1				2	3
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/HOD

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24EE3372	ELECTRICAL SAFETY	L	T	P	C
		0	0	2	1

COURSE OBJECTIVES:

1. Understand the concepts of short circuits and how to rectify them.
2. Outline the electrical safety during installation, testing and commissioning procedure.
3. Analyze about grounding and their types as well the types of electrical insulation.
4. Distinguish the difference between MCB and fuse and their protection.

LIST OF EXPERIMENTS:

1. Demonstration of Short Circuit
   a. Show what happens when a direct short circuit occurs using low-voltage sources.
   b. Emphasize heat generation and fuse operation.
2. Fuse Testing Experiment
   a. Compare wires of different thicknesses or fuse types under increasing current.
   b. Observe when and how fuses blow to prevent overheating.
3. Earthing/Grounding Demonstration
   a. Use a setup with and without grounding to show the difference in current flow during faults.
   b. Demonstrate voltage drop across different ground paths.
4. Circuit Breaker Simulation
   a. Use a miniature circuit breaker (MCB) to simulate overcurrent and trip response.
   b. Teach the difference between MCB and fuse.
5. Insulation Test
   a. Use different materials (plastic, rubber, wood, metal) and a multimeter to test insulating properties.
6. Proper Wiring Techniques

   Teach students how to wire a plug properly, identify color codes, and test with continuity checks.

TOTAL:30 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 To understand the concepts of short circuits and how to rectify them.
CO2 To outline the electrical safety during installation, testing and commissioning procedure.
CO3 To gain knowledge about grounding and their types as well the types of electrical insulation.
CO4 To distinguish the difference between MCB and fuse and their protection.

Course Coordinator

BOS Chairman/HOD

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24GE3451	ENVIRONMENTAL SCIENCE AND SUSTAINABILITY	L	T	P	C
		2	0	0	2

COURSE OBJECTIVES:

1. To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.
2. To impart knowledge on the causes, effects and control or prevention measures of environmental pollution and natural disasters.
3. To facilitate the understanding of global and Indian scenario of renewable and nonrenewable resources, causes of their degradation and measures to preserve them.
4. To familiarize the concept of sustainable development goals and appreciate the interdependence of economic and social aspects of sustainability, recognize and analyze climate changes.
5. To inculcate and embrace sustainability practices and develop a broader understanding on green materials, energy cycles and analyze the role of sustainable urbanization.

UNIT I ENVIRONMENT AND BIODIVERSITY 6

Definition, scope and importance of environment-need for public awareness. Eco-system and Energy flow- Types of biodiversity: genetic, species and ecosystem diversity-values of biodiversity, India as a mega-diversity nation-hot-spots of biodiversity-threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts -conservation of biodiversity: In-situ and ex-situ.

UNIT – II ENVIRONMENTAL POLLUTION 6

Causes, Effects and Preventive measures of Water, Soil, Air and Noise Pollutions. Solid and E-Waste management. Case studies on Occupational Health and Safety Management system (OHASMS). Environmental protection, Environmental protection acts.

UNIT – III RENEWABLE SOURCES OF ENERGY 6

Energy management and conservation, New Energy Sources: Need of new sources. Different types new energy sources. Applications of-Hydrogen energy, Ocean energy resources, Tidal energy conversion. Concept, origin and power plants of geothermal energy.

UNIT – IV SUSTAINABILITY AND MANAGEMENT 6

Development, GDP ,Sustainability-concept, needs and challenges-economic, social and aspects of sustainability-from unsustainability to sustainability-millennium development goals, and protocols-Sustainable Development Goals-targets, indicators and intervention areas Climate change-Global, Regional and local environmental issues and possible solutions-case studies.

UNIT – V SUSTAINABILITY PRACTICES 6

Zero waste and R concept, Circular economies ISO:14000 Series, Material Life cycle assessment, Environmental Impact Assessment. Sustainable habitat: Green buildings, Green materials, Energy efficiency, Sustainable transports. Sustainable energy: Green Engineering: Sustainable urbanization.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.

CO2 To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.

CO3 To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.

CO4 To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.

CO5 To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.

TEXT BOOKS:

1. Anubha Kaushik and C. P. Kaushik's "Perspectives in Environmental Studies", 6th Edition, New Age International Publishers, 2018.
2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2016.
3. Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education, 2004.
4. Allen, D. T. and Shonnard, D. R., Sustainability Engineering: Concepts, Design and Case Studies, Prentice Hall.
5. Bradley. A.S; Adebayo, A.O., Maria, P. Engineering applications in sustainable design and development, Cengage learning.
6. Environment Impact Assessment Guidelines, Notification of Government of India, 2006.
7. Mackenthun, K.M., Basic Concepts in Environmental Management, Lewis Publication, London, 1998.

REFERENCES:

1. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media. 38. Edition 2010.
2. Cunningham, W.P. Cooper, T.H. Gorhani, 'Environmental Encyclopedia', Jaico Publ., House, Mumbai, 2001.
3. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT. LTD, New Delhi, 2007.
4. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, Third Edition, 2015.
5. Erach Bharucha "Textbook of Environmental Studies for Undergraduate Courses" Orient Blackswan Pvt. Ltd. 2013.
6. S.Pream Kumar, K.Vijay Sankar, A. Suresh Kumar, M.Priyanka, "Environmental Science and Sustainability", Charulatha Publications.2025

COs' – PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	2	2	2	2	2	2	1	2	1		1	2	1
2	2	2	2	2	2	2	1	2	1		1	2	1

3	2	2	2	2	2	2	1	2	1	1	2	2	1
4	2	2	2	2	2	2	1	2	1	2	2	2	1
5	2	2	2	2	2	2	1	2	1	1	2	2	1
Low (1) ; Medium (2) ; High (3)													

Course Instructor

HoD

24EE3401 TRANSMISSION AND DISTRIBUTION

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. To impart knowledge about the configuration of the electrical power systems.
2. To study the line parameters and interference with neighboring circuits.
3. To understand the mechanical design and performance analysis of transmission lines.
4. To learn about different insulators and underground cables.
5. To understand and analyze the distribution system.

UNIT – I TRANSMISSION LINE PARAMETERS **9**

Structure of electric power system - Parameters of single and three phase transmission lines with single and double circuits -Resistance, inductance, and capacitance of solid, stranded, and bundled conductors - Typical configuration, conductor types - Symmetrical and unsymmetrical spacing and transposition - application of self and mutual GMD; skin and proximity effects - Effects of earth.

UNIT – II MODELLING AND PERFORMANCE OF TRANSMISSION LINES **9**

Performance of Transmission lines - short line, medium line and long line - equivalent circuits, phasor diagram, attenuation constant, phase constant, surge impedance - transmission efficiency and voltage regulation, real and reactive power flow in lines - Power Circle diagrams - Ferranti effect - Formation of Corona - Critical Voltages - Effect on line Performance.

UNIT – III SAG CALCULATION AND LINE SUPPORTS **9**

Mechanical design of overhead lines - Line Supports -Types of towers - Tension and Sag Calculation for different weather conditions - Methods of grounding - Insulators: Types, voltage distribution in insulator string, improvement of string efficiency, testing of insulators.

UNIT – IV UNDERGROUND CABLES **9**

Underground cables - Types of cables - Construction of single-core and 3-core belted cables Insulation Resistance - Potential Gradient - Capacitance of single-core and 3-core belted cables - Grading of cables - Power factor and heating of cables- DC cables.

UNIT – V DISTRIBUTION SYSTEMS **9**

Distribution Systems - General Aspects - Kelvin' s Law - AC and DC distributions - Concentrated and Distributed loading- Techniques of Voltage Control and Power factor improvement - Distribution Loss - Types of Substations - Trends in Transmission and Distribution: EHVAC, HVDC and FACTS (Qualitative treatment only).

TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Understand the structure of power system, computation of transmission line parameters for different configurations.

CO2 Model the transmission lines to determine the line performance and to understand the impact of Ferranti effect and corona on line performance.

CO3 Do Mechanical design of transmission lines, grounding and to understand about the insulators in transmission system.

CO4 Design the underground cables and understand the performance analysis of underground cable.

CO5 Understand the modelling, performance analysis and modern trends in distribution system.

TEXT BOOKS:

1. D.P.Kothari, I.J. Nagarath, 'Power System Engineering', Mc Graw-Hill Publishing Company limited, New Delhi, Third Edition, 2019.
2. C.L.Wadhwa, 'Electrical Power Systems', New Age International Ltd, seventh edition 2022.
3. S.N. Singh, 'Electric Power Generation, Transmission and Distribution', Prentice Hall of India Pvt. Ltd, New Delhi, Second Edition, 2008.

REFERENCES:

1. B.R.Gupta, 'Power System Analysis and Design' S. Chand, New Delhi, Sixth Edition, 2011.
2. Luces M.Fualken berry, Walter Coffer, 'Electrical Power Distribution and Transmission', Pearson Education, 2007.
3. Arun Ingole, "Power transmission and distribution" Pearson Education, first edition, 2018
4. J.Brian Hardy and Colin R.Bayliss 'Transmission and Distribution in Electrical Engineering Newnes; Fourth Edition, 2011.
5. G.Ramamurthy, "Handbook of Electrical power Distribution," Universities Press, 2013.
6. V.K.Mehta, Rohit Mehta, 'Principles of power system', S. Chand & Company Ltd, New Delhi, 84 2013.
7. Hadi Saadat, 'Power System Analysis', McGraw Hill Education Pvt. Ltd., New Delhi, 3rd Edition, 23rd reprint, 2015.
8. R.K.Rajput, 'A Text Book of Power System Engineering' 2nd edition, Laxmi Publications (P) Ltd, New Delhi, 2016.

COs' – PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	2	1					1	2	1		1		1
2	3	2	1	1		1	2	2	1		1	3	3
3	3	2	1	1		1	2	2	1	1	2	3	3
4	3	2	1	1		1	2	2	1	2	2	3	3
5	3	2	1	1		1	2	2	1	1	2	3	3
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/HOD

24EE3402 INDUCTION AND SYNCHRONOUS MACHINES

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. Construction and performance of salient and non – salient type synchronous generators.
2. Principle of operation and performance of synchronous motor.
3. Construction, principle of operation and performance of induction machines.
4. Starting and speed control of three-phase induction motors.
5. Construction, principle of operation and performance of single phase induction motors and special machines.

UNIT – I THREE PHASE INDUCTION MOTOR **9**

Constructional details – Types of rotors –- Principle of operation – Slip –cogging and crawling- Equivalent circuit – Torque-Slip characteristics - Condition for maximum torque – Losses and efficiency – Load test - No load and blocked rotor tests - Circle diagram – Separation of losses – Double cage induction motors –Induction generators – Synchronous induction motor.

UNIT – II STARTING AND SPEED CONTROL OF THREE PHASE INDUCTION MOTOR **9**

Need for starting – Types of starters – DOL, Rotor resistance, Autotransformer and Star delta starters – Speed control – Voltage control, Frequency control and pole changing – Cascaded Connection-V/f control – Slip power recovery Scheme-Braking of three phase induction motor: Plugging, dynamic braking and regenerative braking.

UNIT – III SINGLE PHASE INDUCTION MOTORS AND SPECIAL MACHINES **9**

Constructional details of single phase induction motor – Double field revolving theory and operation –Equivalent circuit – No load and blocked rotor test – Performance analysis – Starting methods of single-phase induction motors – Capacitor-start capacitor run Induction motor- Shaded pole induction motor - Linear induction motor – Repulsion motor – BLDC motor- Servo motors- Stepper motors - introduction to magnetic levitation systems.

UNIT – IV SYNCHRONOUS GENERATOR **9**

Constructional details – Types of rotors –winding factors- EMF equation – Synchronous reactance Armature reaction – Phasor diagrams of non-salient pole synchronous generator connected to infinite bus--Synchronizing and parallel operation – Synchronizing torque -Change of excitation and mechanical input- Voltage regulation – EMF, MMF and ZPF methods–-slip test.

UNIT – V SYNCHRONOUS MOTOR **9**

Principle of operation – Torque equation – Operation on infinite bus bars - V and Inverted V curves –Power input and power developed equations – Starting methods – Current loci for constant power input, constant excitation and constant power Developed-Hunting – natural frequency of oscillations –damper windings- synchronous condenser.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Ability to understand the construction and working principle of Three Phase Induction Motor.

CO2 Acquire knowledge about the starting and speed control of induction motors.

CO3 To gain knowledge about the basic principles and working of Single Phase Induction motors and special Electrical Machines.

CO4 Ability to understand the construction and working principle of Synchronous Generator.

CO5 Ability to understand the construction and working principle of a synchronous Motor.

TEXT BOOKS:

1. A.E. Fitzgerald, Charles Kingsley, Stephen. D. Umans, 'Electric Machinery', Mc Graw Hill publishing Company Ltd, 6th Education 2017.
2. Stephen J. Chapman, 'Electric Machinery Fundamentals'4th edition, McGraw Hill Education Pvt. Ltd, 4th Edition 2017.
3. D.P. Kothari and I.J. Nagrath, 'Electric Machines', McGraw Hill Publishing Company Ltd, 5th Edition 2017.
4. P.S. Bhimbhra, 'Electrical Machinery', Khanna Publishers, edition 2, 2021.

REFERENCES:

1. Vincent Del Toro, 'Basic Electric Machines' Pearson India Education, 2016.
2. M.N. Bandyo padhyay, Electrical Machines Theory and Practice, PHI Learning PVT LTD., New Delhi, 2011.
3. B.R.Gupta, 'Fundamental of Electric Machines' New age International Publishers,3rd Edition, Reprint 2015.
4. Murugesh Kumar, 'Electric Machines', Vikas Publishing House Pvt. Ltd, First edition 2010.
5. Alexander S. Langsdorf, 'Theory of Alternating-Current Machinery', McGraw Hill Publications, 2001.

COs' – PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	3	3	2			2	2	1	2	3	2
2	3	2	3	2	2			2	2	1	2	3	3
3	2	3	3	2	3			1	2		1	2	2
4	3	2	2	3	3			1	2		1	3	3
5	1	3	3	3	2			2	2	2	1	2	2
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/HOD

24EE3403 **CONTROL SYSTEMS** **L T P C**
3 1 0 4

COURSE OBJECTIVES:

1. To make the students to familiarize with various representations of systems.
2. To make the students to analyze the stability of linear systems in the time domain and frequency domain.
3. To make the students to analyze the stability of linear systems in the frequency domain.
4. To make the students to design compensator based on the time and frequency domain specifications.
5. To develop linear models: mainly state variable model and Transfer function model.

UNIT – I MODELING OF LINEAR TIME INVARIANT SYSTEM 9+3

Control System: Open loop and closed loop – Feedback control system characteristics – First principle modeling: Mechanical, Electrical and Electromechanical systems – Transfer function representations: Block diagram and signal flow graph.

UNIT – II TIME DOMAIN ANALYSIS 9+3

Standard test inputs – Time Response – Time domain specifications – Stability analysis: Concept of stability – Routh Hurwitz stability criterion – Root locus: Construction and interpretation. Effect of adding poles and zeros.

UNIT – III FREQUENCY DOMAIN ANALYSIS 9+3

Bode plot, Polar plot and Nyquist plot – Frequency domain specifications introduction to closed loop Frequency Response.

UNIT – IV DESIGN OF FEEDBACK CONTROL SYSTEM 9+3

Design specifications – Lead, Lag and Lag-Lead compensators using Root locus and Bode plot techniques – PID controller – Design using reaction curve and Ziegler Nichols technique – PID control in State Feedback form.

UNIT – V STATE VARIABLE ANALYSIS 9+3

State variable formulation – Non uniqueness of state space model – State transition matrix – Eigen values – Eigen vectors – Free and forced responses for Time Invariant and Time Varying Systems – Controllability – Observability.

TOTAL: 45+15 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Represent simple systems in transfer function
CO2 Analyse a simple system in the Time domain
CO3 Analyse simple system in frequency domain
CO4 Analyze the design of Lag, Lead and Lag-Lead compensators and design PID controllers.
CO5 Represent the state variable forms.

TEXT BOOKS:

1. Benjamin C. Kuo, Farid Golnaraghi "Automatic Control Systems", 10th edition PHI Learning Private Ltd, 2017.

2. Nagarath, I.J. and Gopal, M., "Control Systems Engineering", New Age International Publishers 2017.

REFERENCES:

1. Richard C.Dorf and Bishop, R.H., "Modern Control Systems", Education Pearson, 3 impression 2009.
2. Kastsuhiko Ogata, "Modern Control Engineering", PHI Learning Private Ltd, 5th Edition, 2010
3. NPTEL Video Lecture Notes on "Control Engineering" by Prof. S.D. Agashe, IIT Bombay.

COs' – PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	3	3	3		1				3	3	3
2	3	3	3	3	3		1				3	3	3
3	3	3	3	3	3		1				3	3	3
4	3	3	3	3	3		1				3	3	3
5	3	3	3	3	3		1				3	3	3
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/HOD

NCC Credit Course Level 2*

24NX3451	(ARMY WING) NCC Credit Course Level - II	L T P C 3 0 0 3

PERSONALITY DEVELOPMENT		**9**
PD 3	Group Discussion: Change your mindset, Time Management, Social Skills	6
PD 5	Public Speaking	3
LEADERSHIP		**7**
L 2	Case Studies: APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murty, Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965	7
DISASTER MANAGEMENT		**13**
DM 1	Disaster Management Capsule: Organisation, Types of Disasters, Essential Services, Assistance, Civil Defence Organisation	3
DM 2	Initiative Training, Organising Skills, Do's & Don't's, Natural Disasters, Man Made Disasters	9
DM 3	Fire Service & Fire Fighting	1
ENVIRONMENTAL AWARENESS & CONSERVATION		**3**
EA 1	Environmental Awareness and Conservation	3
GENERAL AWARENESS		**4**
GA 1	General Knowledge	4
ARMED FORCES		**6**
AF 1	Armed Forces, Army, CAPF, Police	6
ADVENTURE		**1**
AD 1	Introduction to Adventure Activities	1
BORDER & COASTAL AREAS		**2**
BCA 1	History, Geography & Topography of Border/Coastal areas	2

TOTAL: 45 PERIODS

COURSE COORDINATOR

BOS CHAIRMAN

NCC Credit Course Level 2*

24NX3452	(NAVAL WING) NCC Credit Course Level - II	L T P C 3 0 0 3
PERSONALITY DEVELOPMENT		**9**
PD 3	Group Discussion: Change your mindset, Time Management, Social Skills	6
PD 5	Public Speaking	3
LEADERSHIP		**7**
L 2	Case Studies: APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murty, Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965	7
DISASTER MANAGEMENT		**13**
DM 1	Disaster Management Capsule: Organisation, Types of Disasters, Essential Services, Assistance, Civil Defence Organisation	3
DM 2	Initiative Training, Organising Skills, Do's & Don't's, Natural Disasters, Man Made Disasters	9
DM 3	Fire Service & Fire Fighting	1
ENVIRONMENTAL AWARENESS & CONSERVATION		**3**
EA 1	Environmental Awareness and Conservation	3
GENERAL AWARENESS		**4**
GA 1	General Knowledge	4
NAVAL ORIENTATION		**6**
AF 1	Armed Forces and Navy Capsule	3
EEZ 1	EEZ Maritime Security and ICG	3
ADVENTURE		**1**
AD 1	Introduction to Adventure Activities	1
BORDER & COASTAL AREAS		**2**
BCA 1	History, Geography & Topography of Border/Coastal areas	2

TOTAL: 45 PERIODS

COURSE COORDINATOR

BOS CHAIRMAN

NCC Credit Course Level 2*

24NX3453	(AIR FORCE WING) NCC Credit Course Level - II	L T P C 3 0 0 3
PERSONALITY DEVELOPMENT		**9**
PD 3	Group Discussion: Change your mindset, Time Management, Social Skills	6
PD 5	Public Speaking	3
LEADERSHIP		**7**
L 2	Case Studies: APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murty, Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965	7
DISASTER MANAGEMENT		**13**
DM 1	Disaster Management Capsule: Organisation, Types of Disasters, Essential Services, Assistance, Civil Defence Organisation	3
DM 2	Initiative Training, Organising Skills, Do's & Don't's, Natural Disasters, Man Made Disasters	9
DM 3	Fire Service & Fire Fighting	1
ENVIRONMENTAL AWARENESS & CONSERVATION		**3**
EA 1	Environmental Awareness and Conservation	3
GENERAL AWARENESS		**4**
GA 1	General Knowledge	4
GENERAL SERVICE KNOWLEDGE		**6**
GSK 1	Armed Forces & IAF Capsule	2
GSK 2	Modes of Entry in IAF, Civil Aviation	2
GSK 3	Aircrafts - Types, Capabilities & Role	2
ADVENTURE		**1**
AD 1	Introduction to Adventure Activities	1
BORDER & COASTAL AREAS		**2**
BCA 1	History, Geography & Topography of Border/Coastal areas	2

TOTAL: 45 PERIODS

COURSE COORDINATOR

BOS CHAIRMAN

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24EE3404 **LINEAR AND DIGITAL LOGIC CIRCUITS** **L T P C**
3 0 2 4

COURSE OBJECTIVES:

1. To understand the basics of IC fabrication procedure.
2. To understand the characteristics of Op-amp and special ICs.
3. To study various number systems and to simplify the mathematical expressions using Boolean functions.
4. To study implementation of combinational circuits.
5. To study the design of various synchronous circuits.

UNIT – I IC FABRICATION **9**

IC classification, fundamental of monolithic IC technology, epitaxial growth, masking and etching, diffusion of impurities. Realisation of monolithic ICs and packaging. Fabrication of diodes, capacitance and resistance.

UNIT – II CHARACTERISTICS OF OPAMP AND SPECIAL ICs **9**

Ideal OP-AMP characteristics, DC characteristics, AC characteristics, differential amplifier; frequency response of OP-AMP; Voltage-shunt feedback and inverting amplifier - Voltage series feedback: and Non-Inverting Amplifier - Basic applications of op-amp –, summer, differentiator and Integrator-V/I & I/V converters – Functional block and characteristics of 555 Timer with applications.

UNIT – III NUMBER SYSTEMS AND DIGITAL LOGIC FAMILIES **9**

Number system, error detection, corrections & codes conversions, Boolean algebra: De- Morgan's theorem and switching functions - Digital Logic Families -comparison of RTL, DTL, TTL, ECL and MOS families - operation, characteristics of digital logic family.

UNIT – IV COMBINATIONAL LOGIC CIRCUITS **9**

Combinational logic - representation of logic functions-SOP and POS forms, K-map representations - minimization using K maps - simplification and implementation of combinational logic – multiplexers and de multiplexers. code converters, adders, subtractors, Encoders and Decoders.

UNIT – V SYNCHRONOUS SEQUENTIAL CIRCUITS **9**

Sequential logic- SR, JK, D and T flip flops - level triggering and edge triggering - counters - asynchronous and synchronous type - Modulo counters - Shift registers - design of synchronous sequential circuits – Moore and Mealy models – Counters, state diagram; state reduction.

TOTAL: 45 PERIODS

LIST OF EXPERIMENTS

1. Implementation of Boolean Functions, Adder and Subtractor circuits.
2. Code converters: Excess-3 to BCD and Binary to Gray code converter and vice-versa.
3. Parity generator and parity checking.
4. Encoders and Decoders.
5. Shift Registers: Design and implementation of 4-bit shift registers in SISO, SIPO, PISO,PIPO

modes using suitability IC's.

6. Study of multiplexer and de multiplexer.
7. Application of Op-Amp: inverting and non-inverting amplifier, Adder, comparator, Integrator and Differentiator.
8. Timer IC application: Study of NE/SE 555 timer in Astability operation.

TOTAL: 30 PERIODS
TOTAL: 45+30=75 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 Explain the monolithic IC fabrication process of diodes, capacitance and resistance.

CO2 Analyze the characteristics and basic applications (inverting/non-inverting amplifier, summer, differentiator, integrator, V/I and I/V converter) of Op-Amp also Functional blocks, characteristics of Timer ICs.

CO3 Explain various number systems and characteristics of digital logic families.

CO4 Explain the implementation of combinational circuit such as multiplexers and de multiplexers - code converters, adders, subtractors, Encoders and Decoders.

CO5 Design various synchronous circuits using flip flops.

TEXT BOOKS:

1. David A. Bell, 'Op-amp & Linear ICs', Oxford, Third Edition, 2011.
2. D. Roy Choudhary, Sheil B. Jani, 'Linear Integrated Circuits', , New Age, Fourth Edition, 2018.
3. Morris Mano.M, 'Digital Logic and Computer Design', Prentice Hall of India, 3rdEdition, 2005.
4. Donald D.Givone, 'Digital Principles and Design', Tata McGraw Hill,1st Edition, 2003.
5. Thomas L Floyd, 'Digital fundamentals', Pearson Education Limited, 11th Edition, 2018.

REFERENCES:

1. Jacob Millman, Christos C.Halkias, 'Integrated Electronics - Analog and Digital circuits system, McGraw Hill, 2nd Edition, 2017.
2. Sergio Franco, 'Design with Operational Amplifiers and Analog Integrated Circuits',McGraw Hill, 2016 – Fourth Edition.
3. Tocci R.J., Neal S. Widmer, 'Digital Systems: Principles and Applications', Pearson Education Asia, 12th Edition, 2017.

COs' – PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	2	2	3	2	2		1				1	3	2
2	2	2	3	2	2		1				1	3	2
3	3	3	3	1	3		1				1	3	3
4	3	3	3	1	3		1				1	3	3
5	3	3	3	1	3		1				1	3	3
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/HOD

24CS3402 **OBJECT ORIENTED PROGRAMMING** **L T P C**

3 0 2 4

COURSE OBJECTIVES:

1. To understand Object Oriented Programming concepts and basics of Java programming language
2. To know the principles of packages, inheritance and interfaces
3. To develop a java application with threads and generics classes
4. To define exceptions and use I/O streams
5. To design and build Graphical User Interface Application using JAVAFX

UNIT I INTRODUCTION TO OOP AND JAVA **9**

Overview of OOP – Object oriented programming paradigms – Features of Object-Oriented Programming – Java Buzzwords – Overview of Java – Data Types, Variables and Arrays – Operators – Control Statements – Programming Structures in Java – Defining classes in Java – Constructors- Methods -Access specifiers - Static members- Java Doc comments

UNIT – II INHERITANCE, PACKAGES AND INTERFACES **9**

Overloading Methods – Objects as Parameters – Returning Objects –Static, Nested and Inner Classes. Inheritance: Basics– Types of Inheritance -Super keyword -Method Overriding – Dynamic Method Dispatch –Abstract Classes – final with Inheritance. Packages and Interfaces: Packages – Packages and Member Access –Importing Packages – Interfaces.

UNIT – III EXCEPTION HANDLING AND MULTITHREADING **9**

Exception Handling basics – Multiple catch Clauses – Nested try Statements – Java's Built-in Exceptions – User defined Exception. Multithreaded Programming: Java Thread Model–Creating a Thread and Multiple Threads – Priorities – Synchronization – Inter Thread Communication- Suspending –Resuming, and Stopping Threads –Multithreading. Wrappers – Auto boxing

UNIT IV I/O, GENERICS, STRING HANDLING **9**

I/O Basics – Reading and Writing Console I/O – Reading and Writing Files. Generics: Generic Programming – Generic classes – Generic Methods – Bounded Types – Restrictions and Limitations. Strings: Basic String class, methods and String Buffer Class.

UNIT V JAVAFX EVENT HANDLING, CONTROLS AND COMPONENTS **9**

JAVAFX Events and Controls: Event Basics – Handling Key and Mouse Events. Controls: Checkbox, Toggle Button – Radio Buttons – List View – Combo Box – Choice Box – Text Controls – Scroll Pane. Layouts – Flow Pane – HBox and VBox – Border Pane – Stack Pane – Grid Pane. Menus – Basics – Menu – Menu bars – Menu Item

TOTAL: 45 PERIODS

PRACTICALS

1. Solve problems by using sequential search, binary search, and quadratic sorting algorithms (selection, insertion)
2. Develop stack and queue data structures using classes and objects.
3. Develop a java application with an Employee class with Emp_name, Emp_id, Address, Mail_id, Mobile_no as members. Inherit the classes, Programmer, Assistant Professor, Associate Professor and Professor from employee class. Add Basic Pay (BP) as the member of all the inherited classes with 97% of BP as DA, 10 % of BP as HRA, 12% of BP as PF, 0.1% of BP for staff club funds. Generate pay slips for the employees with their gross and net salary.
4. Write a Java Program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method printArea( ) that prints the area of the given shape.
5. Solve the above problem using an interface.
6. Implement exception handling and creation of user defined exceptions.
7. Write a java program that implements a multi-threaded application that has three threads. First thread generates a random integer every 1 second and if the value is even, the second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of the cube of the number.
8. Write a program to perform file operations.
9. Develop applications to demonstrate the features of generics classes.
10. Develop applications using JavaFX controls, layouts and menus

PRACTICALS: 30 PERIODS

TOTAL: 45+30= 75 PERIODS

COURSE OUTCOMES

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

CO1	Apply the concepts of classes and objects to solve simple problems.
CO2	Develop programs using inheritance, packages and interfaces
CO3	Make use of exception handling mechanisms and multithreaded model to solve real world problems
CO4	Build Java applications with I/O packages, string classes, Collections and generics concepts.
CO5	Integrate the concepts of event handling and JavaFX components and controls for developing GUI based applications.

TEXT BOOKS

1. Herbert Schildt, "Java: The Complete Reference", 11th Edition, McGraw Hill Education, New Delhi, 2019
2. Herbert Schildt, "Introducing JavaFX 8 Programming", 1st Edition, McGraw Hill Education, New Delhi, 2015

REFERENCE BOOK

1. Cay S. Horstmann, "Core Java Fundamentals", Volume 1, 11th Edition, Prentice Hall, 2018.

CO's-PO's & PSO's MAPPING

CO	PO											PSO	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	1	1	3	1	3			3	2	2	2	3	1
2	2	1	3	2	1			2	1	1	3	3	3
3	3	3	1	2	2			3	2	1	2	3	1
4	3	1	2	2	2			1	2	1	3	3	1
5	1	1	2	3	2			3	2	1	2	3	3

Low (1) ; Medium (2) ; High (3)

COURSE COORDINATOR **BOS CHAIRMAN/ HOD**

24EE3411	INDUCTION AND SYNCHRONOUS MACHINES LABORATORY	L	T	P	C
		0	0	3	1.5

COURSE OBJECTIVES:

1. To expose the students to the operation of synchronous machines and induction motors and give them experimental skill.

LIST OF EXPERIMENTS

1. Load test on three-phase induction motor.
2. No load and blocked rotor tests on three-phase induction motor.
3. Separation of No-load losses of three-phase induction motor.
4. Load test on single-phase induction motor.
5. No-load and blocked rotor test on single-phase induction motor.
6. Regulation of three phase alternator by EMF Methods.
7. Regulation of three phase alternator by MMF Methods.
8. V and Inverted V curves of Three Phase Synchronous Motor.
9. Regulation of three phase salient pole alternator by slip test.
10. Study of Induction Motor Starters.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the students will be able to

CO1 Analyse the voltage regulation of three phase alternator for different loading condition in different methods and compare the results.

CO2 Analyse the voltage regulation of three phase salient pole synchronous machine in different loading condition and estimate its negative and zero sequence components.

CO3 Investigate the characteristics of three phase synchronous machine at different load condition for different excitation.

CO4 Understand the concepts and performance characteristics of three three-phase induction motor at different load condition and estimate its equivalent circuit parameters.

CO5 Understand the concepts performance characteristics of a single-phase induction motor at different load condition and estimate its equivalent circuit parameters.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	3	3	3				1			3	3
2	3	3	3	2	2				1			3	3
3	3	3	3	3	3				1			3	3
4	3	3	3	3	3				1			3	3
5	3	3	3	3	3				1			3	3

Low (1) ; Medium (2) ; High (3)

Course Coordinator

BOS Chairman/HOD

24EE3412	CONTROL AND INSTRUMENTATION LABORATORY	L	T	P	C
		0	0	3	1.5

COURSE OBJECTIVES:

1. To make the students familiarize with various representations of systems.
2. To make the students analyze the stability of linear systems in the time domain and frequency domain.
3. To make the students design compensator based on the time and frequency domain specifications.
4. To develop linear models mainly state variable model and transfer function model.
5. To make the students to design a complete closed path control system for the physical systems.

LIST OF EXPERIMENTS

1. Mathematical modeling and simulation of physical systems in at least two fields.
   - Mechanical
   - Electrical
   - Chemical process
2. System identification through process reaction curves.
3. Stability analysis using Pole zero maps and Routh Hurwitz Criterion in simulation platform.
4. Root locus-based analysis in simulation platform.
5. Determination of transfer function of a physical system using frequency response and Bode's asymptotes.
6. Design of Lag, Lead compensators and evaluation of closed loop performance.
7. Design of PID controllers and evaluation of closed loop performance.
8. Discretization of continuous system and effect of sampling.
9. Test of controllability and observability in continuous and discrete domain in simulation.
10. State feedback and state observer design and evaluation of closed loop performance.
11. Frequency response analysis of a 3rd order system using Bode plot.
12. Mini Project 1: Simulation of complete closed loop control systems including sensor and actuator dynamics.
13. Mini Project 2: Demonstration of a closed loop system in hardware.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1	Model and analyze simple physical systems and simulate the performance in analog and digital platform.
CO2	Design compensators based on time and frequency domain specifications.
CO3	Design and implement simple controllers in standard forms.
CO4	Analyze the stability of physical system in both continuous and discrete domains.
CO5	Design a complete closed loop control loop and evaluate its performance for simple systems.

COs' – PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	3	3	3		2				2	3	3
2	3	3	3	3	3		2				2	3	3
3	3	3	3	3	3		2				2	3	3
4	3	3	3	3	3		2				2	3	3
5	3	3	3	3	3		2				2	3	3
Low (1) ; Medium (2) ; High (3)													

Course Coordinator

BOS Chairman/HOD

SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution)
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

24EE3472	PCB DESIGN AND FABRICATION	L	T	P	C
		0	0	2	1

COURSE OBJECTIVES:

1. Understand the need for PCB Design and steps involved in PCB Design and Fabrication process.
2. Understand the various PCB simulation tools.
3. Develop PCB Designing Flow Chart and description.
4. Design of different circuits on PCB.
5. Familiarize Schematic and layout design flow using Electronic Design Automation (EDA) Tools.

LIST OF EXPERIMENTS:

1. Using any Electronic design automation (EDA) software, practice following PCB design steps (Open source EDA Tool KiCad, EasyEDA, Fritzing etc.,)
2. Introduction to PCB DESIGN and EDA Tool Software.
3. PCB Designing of Basic and Analog Electronic Circuits.
4. Design of a ±5V Power supply.
5. Design and simulation of a Half and Full Wave Rectifier.
6. Design and simulation of a Astable and Monostable Multivibrator.
7. Design and simulate simple 7 segment circuits.
8. PCB designing of different sensor modules.
9. Mini Project - PCB designing of simple Electronics or Embedded Projects.

TOTAL:30 PERIODS

COURSE OUTCOMES:	
At the end of the course the students will be able to	
CO1	Understand the steps involved in schematic, layout, fabrication and assembly process of PCB design.
CO2	Determine appropriate components and various simulation tools to make PCB circuits.
CO3	Design of a Power Supply Module and Rectifiers.
CO4	Design (schematic and layout) PCB for analog circuits, digital circuits and mixed circuits.
CO5	Design (schematic and layout) and fabricate PCB for simple circuits.

Course Coordinator

BOS Chairman/HOD