KSR College of Engineering

AN AUTONOMOUS INSTITUTION

NAAC ACCREDITED A++ | NBA ACCREDITED PROGRAMMES

25 Years KSRCE 2001 – 2026 Celebrating Academic Excellence

B.E. - ELECTRICAL AND ELECTRONICS ENGINEERING

REGULATIONS 2024

(Academic Year 2025-26 Onwards)

Curriculum & Syllabus
Semester I and II

K.S.R. COLLEGE OF ENGINEERING: TIRUCHENGODE - 637 215

(Autonomous)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.E. - Electrical and Electronics Engineering

(REGULATIONS 2024)

Vision of the Institution

IV	To become a globally renowned institution in Engineering and Management, committed to providing holistic education that fosters research, innovation and sustainable development.

Mission of the Institution

IM 1	Deliver value-based quality education through modern pedagogy and experiential learning.
IM 2	Enrich Engineering and Managerial Skills through cutting-edge laboratories to meet evolving global demands.
IM 3	Empower research and innovation by integrating collaboration, social responsibility, and commitment to sustainable development.

Vision of the Department

DV	To produce competent Electrical and Electronics Engineers driving sustainable solutions through quality education and research.

Mission of the Department

DM 1	Provide transformative education in Electrical and Electronics Engineering by integrating modern pedagogy and technology-enhanced learning.
DM 2	Deliver holistic, value-driven education through cutting-edge laboratory facilities that meet the evolving needs of global industries.
DM 3	Promote collaborative and interdisciplinary research to develop sustainable solutions.

Programme Educational Objectives (PEOs): B.E. - Electrical and Electronics Engineering

The graduates of the programme will be able to	
PEO 1	**Core Competency:** Graduates will exhibit strong technical knowledge in Electrical and Electronics Engineering to analyze, design and develop sustainable engineering solutions.
PEO 2	**Professionalism:** Graduates will integrate interdisciplinary knowledge and ethical responsibility to develop innovative solutions addressing societal challenges.
PEO 3	**Career Development:** Graduates will engage in lifelong learning and research for sustainable development to meet the evolving needs of the industry.

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Programme Outcomes (POs) of B.E. - Electrical and Electronics Engineering

Program Outcomes (POs)	
PO1	**Engineering Knowledge:** Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
PO2	**Problem Analysis:** Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
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. (WK5)
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. (WK8).
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. (WK2 and WK6)
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. (WK1, WK5, and WK7).
PO7	**Ethics:** Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
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 for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)
Program Specific Outcomes (PSOs)	
PSO1	**Power and Energy Systems:** Design, operate, maintain efficient and sustainable electrical power systems with renewable energy integration.
PSO2	**Embedded System and Automation:** Develop embedded, real-time control systems, and power electronic solutions for industrial process automation.

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	K.S.R. COLLEGE OF ENGINEERING Autonomous Institution Approved by AICTE and Affiliated to Anna University, Chennai Accredited by NAAC ('A++' Grade)	Curriculum UG R - 2024
Department	Department of Electrical and Electronics Engineering	
Programme	B.E - Electrical and Electronics Engineering	

SEMESTER - I

S. No.	Course Code	Course Title	Category	Periods per semester					Credit	Max. Marks		
				L	T	P	SL	Tot.	C= T/30	CA	ES	Total
Induction Programme			MC	-	-	-	-	-	-	-	-	-
THEORY COURSES												
1.	24ENT19	Professional Communication	HSMC	45	0	0	45	90	3	40	60	100
2.	24GET19	தமிழர் மரபு / Heritage of Tamils	HSMC	15	0	0	15	30	1	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
3.	24MAI19	Matrices and Calculus	BSC	45	0	30	45	120	4	50	50	100
4.	24PHI07	Engineering Physics	BSC	45	0	30	45	120	4	50	50	100
5.	24CHI06	Chemistry for Engineers	BSC	45	0	30	45	120	4	50	50	100
6.	24ITI16	Programming for Problem Solving	ESC	15	0	90	15	120	4	50	50	100
LABORATORY COURSES												
7.	24MEP16	Engineering Graphics Laboratory	ESC	15	0	30	15	60	2	60	40	100
8.	24GEP16	Engineering Experience Laboratory	ESC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSES												
9.	24SDP19	Soft Skills Development – I	EEC	0	0	30	0	30	1	60	40	100
MANDATORY COURSES												
10.	-	Mandatory Course – I	MC	0	0	30	0	30	-	-	-	-
			Total	**225**	**0**	**300**	**225**	**750**	**24**	**900**		

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SEMESTER - II													
S. No.	Course Code	Course Title	Category	Periods per semester					Credit	Max. Marks		
				L	T	P	SL	Tot.	C= T/30	CA	ES	Total
THEORY COURSES												
1.	24ECT21	Design Thinking	PCC	30	0	0	30	60	2	40	60	100
2.	24GET29	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	HSMC	15	0	0	15	30	1	40	60	100
3.	24EET21	Electric Circuit Analysis	PCC	45	15	0	60	120	4	40	60	100
4.	24EET22	Electron Devices and Circuits	PCC	45	0	0	45	90	3	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
5.	24MAI29	Probability and Statistics	BSC	45	0	30	45	120	4	50	50	100
6.	24CBI26	Python Programming	ESC	45	0	30	45	120	4	50	50	100
LABORATORY COURSES												
7.	24ENP29	Professional Communication Laboratory	HSMC	0	0	30	0	30	1	60	40	100
8.	24EEP21	Electric Circuits and Electron Devices Laboratory	PCC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSES												
9.	24SDP29	Soft Skills Development – II	EEC	0	0	30	0	30	1	60	40	100
			Total	**225**	**15**	**150**	**240**	**630**	**21**	**900**		

SEMESTER – III												
S. No.	Course Code	Course Title	Category	Periods per semester					Credit	Max. Marks		
				L	T	P	SL	Tot.	C= T/30	CA	ES	Total
THEORY COURSES												
1.	24MAT38	Transforms and Partial Differential Equations	BSC	45	15	0	60	120	4	40	60	100
2.	24EET31	Electromagnetic Field Theory	PCC	45	15	0	60	120	4	40	60	100
3.	24EET32	Electrical Machines - I	PCC	45	15	0	60	120	4	40	60	100
4.	24EET33	Linear Integrated Circuits	PCC	45	0	0	45	90	3	40	60	100
5.	24EET34	Digital Logic Circuits	PCC	45	15	0	60	120	4	40	60	100
LABORATORY COURSES												
6.	24EEP31	Electrical Machines - I Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
7.	24EEP32	Linear and Digital Circuits Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
8.	24ECP36	Design Studio – I	ESC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSES												
9.	24SDP39	Soft Skills Development – III	EEC	0	0	30	0	30	1	60	40	100
			Total	**225**	**60**	**150**	**285**	**720**	**24**	**900**		

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SEMESTER - IV													
S. No.	Course Code	Course Title	Category	Periods per semester					Credit	Max. Marks		
				L	T	P	SL	Tot.	C= T/30	CA	ES	Total
THEORY COURSES													
1.	24MAT46	Numerical and Computational Techniques	BSC	45	15	0	60	120	4	40	60	100
2.	24EET41	Electrical Machines - II	PCC	45	15	0	60	120	4	40	60	100
3.	24EET42	Generation, Transmission and Distribution	PCC	45	0	0	45	90	3	40	60	100
4.	24EET43	Measurements and Instrumentation	PCC	45	0	0	45	90	3	40	60	100
5.	24GET09	Universal Human Values and Ethics	HSMC	45	0	0	45	90	3	40	60	100
6.	-	Open Elective - I	OEC	45	0	0	45	90	3	40	60	100
LABORATORY COURSES													
7.	24EEP41	Electrical Machines - II Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
8.	24ECP46	Design Studio – II	ESC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSES													
9.	24EEP42	Seminar Presentation	EEC	0	0	30	0	30	1	100	-	100
10.	24SDP49	Soft Skills Development – IV	EEC	0	0	30	0	30	1	60	40	100
			Total	**270**	**30**	**135**	**300**	**735**	**24.5**	**1000**		

SEMESTER - V												
S. No.	Course Code	Course Title	Category	Periods per semester					Credit	Max. Marks		
				L	T	P	SL	Tot.	C= T/30	CA	ES	Total
THEORY COURSES												
1.	24EET51	Power System Analysis	PCC	45	15	0	60	120	4	40	60	100
2.	24EET52	Control Systems	PCC	45	15	0	60	120	4	40	60	100
3.	24EET53	Power Electronics	PCC	45	0	0	45	90	3	40	60	100
4.	-	Professional Elective - I	PEC	45	0	0	45	90	3	40	60	100
5.	-	Open Elective - II	OEC	45	0	0	45	90	3	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
6.	24EEI51	Microprocessors and Microcontrollers	PCC	45	0	30	45	120	4	50	50	100
LABORATORY COURSES												
7.	24EEP51	Control and Instrumentation Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
8.	24EEP52	Power Electronics Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
EMPLOYABILITY ENHANCEMENT COURSES												
9.	-	Industry Oriented Course – I	EEC	0	0	0	0	0	1	100	-	100
10.	24EEP53	Internship - I*	EEC	0	0	0	0	0	1	100	-	100
MANDATORY COURSE												
11.	-	Mandatory Course – II	MC	30	0	0	0	30	0	100	-	100
			Total	**300**	**30**	**120**	**300**	**750**	**26**	**1100**		

*The students should undergo internship during the IV semester summer vacation.

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SEMESTER - VI													
S. No.	Course Code	Course Title	Category	Periods per semester					Credit	Max. Marks		
				L	T	P	SL	Tot.	C= T/30	CA	ES	Total
THEORY COURSES													
1.	24GET69	Entrepreneurship Development	HSMC	45	0	0	45	90	3	40	60	100
2.	24EET61	Protection and Switchgear	PCC	45	0	0	45	90	3	40	60	100
3.	-	Professional Elective - II	PEC	45	0	0	45	90	3	40	60	100
4.	-	Professional Elective - III	PEC	45	0	0	45	90	3	40	60	100
5.	-	Open Elective - III	OEC	45	0	0	45	90	3	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT													
6.	24EEI61	Embedded Systems	PCC	45	0	30	45	120	4	50	50	100
LABORATORY COMPONENT													
7.	24EEP61	Power System Simulation Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
EMPLOYABILITY ENHANCEMENT COURSES													
8.	24EEP62	Mini Project	EEC	0	0	60	0	60	2	60	40	100
9.	24EEP63	Technical Comprehension	EEC	0	0	30	0	30	1	100	-	100
10.	-	Industry Oriented Course - II	EEC	0	0	0	0	0	1	100	-	100
MANDATORY COURSE													
11.	-	Mandatory Course - III	MC	30	0	0	0	30	0	100	-	100
			Total	**300**	**0**	**165**	**270**	**735**	**24.5**	**1100**		

SEMESTER - VII												
S. No.	Course Code	Course Title	Category	Periods per semester					Credit	Max. Marks		
				L	T	P	SL	Tot.	C= T/30	CA	ES	Total
THEORY COURSES												
1.	24EET71	Electric Power Utilization and Conservation	PCC	45	0	0	45	90	3	40	60	100
2.	24EET72	Standards in Electrical Engineering	PCC	15	0	0	15	30	1	100	-	100
3.	-	Professional Elective - IV	PEC	45	0	0	45	90	3	40	60	100
4.	-	Professional Elective - V	PEC	45	0	0	45	90	3	40	60	100
5.	-	Professional Elective - VI	PEC	45	0	0	45	90	3	40	60	100
EMPLOYABILITY ENHANCEMENT COURSES												
6.	24EEP71	Project Phase - I	EEC	0	0	60	0	60	2	60	40	100
			Total	**195**	**0**	**60**	**195**	**450**	**15**	**600**		

*The students should undergo internship during the VI semester summer vacation

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SEMESTER – VIII													
S. No.	Course Code	Course Title	Category	Periods per semester					Credit	Max. Marks		
				L	T	P	SL	Tot.	C= T/30	CA	ES	Total
EMPLOYABILITY ENHANCEMENT COURSES												
1.	24EEP81	Project Phase - II	EEC	0	0	240	0	240	8	60	40	100
			Total	**0**	**0**	**240**	0	**240**	**8**	**100**		
								Total Credits	**169**			
Total Number of Credits to be Earned for the Award of the Degree = 169												

Note: HSMC – Humanities and Social Sciences including Management Courses, BSC – Basic Science Courses, ESC – Engineering Sciences Courses, PCC – Professional Core Courses, PEC – Professional Elective Courses, OEC – Open Elective Courses, EEC – Employability Enhancement Courses & MC – Mandatory Courses.

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	K.S.R. COLLEGE OF ENGINEERING Autonomous Institution Approved by AICTE and Affiliated to Anna University, Chennai Accredited by NAAC ('A++' Grade)	Curriculum UG R - 2024
Department	Department of Electrical and Electronics Engineering	
Programme	B.E - Electrical and Electronics Engineering	

HUMANITIES, SOCIAL SCIENCE AND MANAGEMENT COURSES (HSMC)

S. No.	Course Code	Course Title	Category	Periods per semester					C= T/30	Max. Marks		
				L	T	P	SL	Tot.		CA	ES	Total
1	24ENT19	Professional Communication	HSMC	45	0	0	45	90	3	40	60	100
2	24GET19	தமிழர் மரபு / Heritage of Tamils	HSMC	15	0	0	15	30	1	40	60	100
3	24GET29	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	HSMC	15	0	0	15	30	1	40	60	100
4	24ENP29	Professional Communication Laboratory	HSMC	0	0	30	0	30	1	60	40	100
5	24GET09	Universal Human Values and Ethics	HSMC	45	0	0	45	90	3	40	60	100
6	24GET69	Entrepreneurship Development	HSMC	45	0	0	45	90	3	40	60	100
			Total	**165**	**0**	**30**	**165**	**360**	**12**	-		

BASIC SCIENCE COURSES (BSC)

S. No.	Course Code	Course Title	Category	Periods per Semester					C= T/30	Max. Marks		
				L	T	P	SL	Tot.		CA	ES	Total
1	24MAI19	Matrices and Calculus	BSC	30	15	30	45	120	4	50	50	100
2	24PHI07	Engineering Physics	BSC	45	0	30	45	120	4	50	50	100
3	24CHI06	Chemistry for Engineers	BSC	45	0	30	45	120	4	50	50	100
4	24MAI29	Probability and Statistics	BSC	30	15	30	45	120	4	50	50	100
5	24MAT38	Transforms and Partial Differential Equations	BSC	45	15	0	60	120	4	40	60	100
6	24MAT46	Numerical and Computational Techniques	BSC	45	15	0	60	120	4	40	60	100
			Total	**240**	**60**	**120**	**300**	**720**	**24**	-	-	-

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ENGINEERING SCIENCES COURSES (ESC)													
S. No.	Course Code	Course Title	Category	Periods per Semester					C= T/30	Max. Marks		
				L	T	P	SL	Tot.		CA	ES	Total
1	24ITT16	Programming for Problem Solving	ESC	45	0	0	45	90	3	40	60	100
2	24ITP16	Programming for Problem Solving Laboratory	ESC	0	0	30	0	30	1	60	40	100
3	24MEP16	Engineering Graphics Laboratory	ESC	15	0	30	15	60	2	60	40	100
4	24GEP16	Engineering Experience Laboratory	ESC	0	0	30	0	30	1	60	40	100
5	24CST29	Python Programming	ESC	45	0	0	45	90	3	40	60	100
6	24CSP29	Python Programming Laboratory	ESC	0	0	30	0	30	1	60	40	100
7	24ECP36	Design Studio – I	ESC	0	0	30	0	30	1	60	40	100
			Total	**105**	**0**	**150**	**105**	**360**	**12**	-	-	-

EMPLOYABILITY ENHANCEMENT COURSES (EEC)												
S. No.	Course Code	Course Title	Category	Periods per Semester					C= T/30	Max. Marks		
				L	T	P	SL	Tot.		CA	ES	Total
1.	24SSP19	Aptitude and Coding Skills – I	EEC	0	0	30	0	30	1	60	40	100
2.	24SSP29	Aptitude and Coding Skills – II	EEC	0	0	30	0	30	1	60	40	100
3.	24SDP39	Soft Skills Development – III	EEC	0	0	30	0	30	1	60	40	100
4.	24EEP42	Seminar Presentation	EEC	0	0	30	0	30	1	100	-	100
5.	24SDP49	Soft Skills Development – IV	EEC	0	0	30	0	30	1	60	40	100
6.	-	Industry Oriented Course – I	EEC	0	0	0	0	0	1	100	-	100
7.	24EEP53	Internship - I*	EEC	0	0	0	0	0	1	100	-	100
8.	24EEP62	Mini Project	EEC	0	0	60	0	60	2	60	40	100
9.	24EEP63	Technical Comprehension	EEC	0	0	30	0	30	1	100	-	100
10.	-	Industry Oriented Course - II	EEC	0	0	0	0	0	1	100	-	100
11.	24EEP71	Project Phase - I	EEC	0	0	60	0	60	2	60	40	100
12.	24EEP81	Project Phase - II	EEC	0	0	240	0	240	8	60	40	100
			Total	**0**	**0**	**540**	**0**	**540**	**21**	-	-	-

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PROFESSIONAL CORE COURSES (PCC)													
S. No.	Course Code	Course Title	Category	Periods / Semester					C= T/30	Max. Marks		
				L	T	P	SL	Tot.		CA	ES	Total
1.	24ECT21	Design Thinking	PCC	30	0	0	30	60	2	40	60	100
2.	24EEI21	Electric Circuit Analysis	PCC	45	0	30	45	120	4	50	50	100
3.	24EEI22	Analog Electronics	PCC	45	0	30	45	120	4	50	50	100
4.	24EET31	Electromagnetic Field Theory	PCC	45	15	0	60	120	4	40	60	100
5.	24EET32	Electrical Machines - I	PCC	45	15	0	60	120	4	40	60	100
6.	24EET33	Linear Integrated Circuits	PCC	45	0	0	45	90	3	40	60	100
7.	24EET34	Digital Logic Circuits	PCC	45	15	0	60	120	4	40	60	100
8.	24EEP31	Electrical Machines - I Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
9.	24EEP32	Linear and Digital Circuits Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
10.	24EET41	Electrical Machines - II	PCC	45	0	0	45	90	3	40	60	100
11.	24EET42	Generation, Transmission and Distribution	PCC	45	15	0	60	120	4	40	60	100
12.	24EET43	Measurements and Instrumentation	PCC	45	0	0	45	90	3	40	60	100
13.	24EEP41	Electrical Machines - II Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
14.	24ECP46	Design Studio – II	PCC	0	0	30	0	30	1	60	40	100
15.	24EET51	Power System Analysis	PCC	45	15	0	60	120	4	40	60	100
16.	24EET52	Control Systems	PCC	45	15	0	60	120	4	40	60	100
17.	24EET53	Power Electronics	PCC	45	0	0	45	90	3	40	60	100
18.	24EEI51	Microprocessors and Microcontrollers	PCC	45	0	30	45	120	4	50	50	100
19.	24EEP51	Control and Instrumentation Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
20.	24EEP52	Power Electronics Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
21.	24EET61	Protection and Switchgear	PCC	45	0	0	45	90	3	40	60	100
22.	24EEI61	Embedded Systems	PCC	45	0	30	45	120	4	50	50	100
23.	24EEP61	Power System Simulation Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
24.	24EET71	Electric Power Utilization and Conservation	PCC	45	0	0	45	90	3	40	60	100
25.	24EET72	Standards in Electrical Engineering	PCC	15	0	0	15	30	1	100	-	100
			Total	**765**	**90**	**420**	**855**	**2130**	**71**	-	-	-

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Applicable for the students admitted from 2025-2026 onwards

S.No.	VERTICAL – 1 Electric Vehicle Technology	VERTICAL – 2 Embedded Systems and IOT	VERTICAL – 3 Power Engineering	VERTICAL – 4 Converters and Drives	VERTICAL – 5 Advanced Control	VERTICAL – 6 Industrial Automation
1.	Electric and Hybrid Vehicles	Microcontroller Based System Design	Power Plant Engineering	Industrial Electronics	Signals and Systems	Soft Computing
2.	Special Electrical Machines	Embedded Control for Electric Drives	Power System Operation and Control	Solid State Drives	Digital Signal Processing	Intelligent Control of Electric Vehicles
3.	Batteries and Charging Management Systems	Smart System Automation	High Voltage Engineering	Power Electronics for Renewable Energy Sources	Digital Image Processing	Energy Auditing and Management
4.	Electric Vehicle Architecture	Industrial IoT	High Voltage Direct Current Transmission	Design of Power Converters	Advanced Control System	Robotics Engineering
5.	Testing of Electric Vehicles	Embedded Processors	Smart Grid	Multilevel Power Converters	Artificial Intelligence and Machine Learning	PLC Programming
6.	Energy Storage Systems	Embedded System Design	Power Quality	Installation of Solar and Wind Power Generation Systems	Virtual Instrumentation	Sensor Concepts and Techniques

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Centre for Academic Courses, K.S.R. College of Engineering, Tiruchengode-637215

S. No.	Course Code	Course Title	Category	Periods / Semester					C= T/30	Max. Marks		
				L	T	P	SL	Tot.		CA	ES	Total
VERTICAL 1: ELECTRIC VEHICLE TECHNOLOGY												
1	24EEE01	Electric and Hybrid Vehicles	PEC	45	0	0	45	90	3	40	60	100
2	24EEE02	Special Electrical Machines	PEC	45	0	0	45	90	3	40	60	100
3	24EEE03	Batteries and Charging Management Systems	PEC	45	0	0	45	90	3	40	60	100
4	24EEE04	Electric Vehicle Architecture	PEC	45	0	0	45	90	3	40	60	100
5	24EEE05	Testing of Electric Vehicles	PEC	45	0	0	45	90	3	40	60	100
6	24EEE06	Energy Storage Systems	PEC	45	0	0	45	90	3	40	60	100
VERTICAL 2: EMBEDDED SYSTEMS AND IOT												
1	24EEE07	Microcontroller Based System Design	PEC	45	0	0	45	90	3	40	60	100
2	24EEE08	Embedded Control for Electric Drives	PEC	45	0	0	45	90	3	40	60	100
3	24EEE09	Smart System Automation	PEC	45	0	0	45	90	3	40	60	100
4	24EEE10	Industrial IoT	PEC	45	0	0	45	90	3	40	60	100
5	24EEE11	Embedded Processors	PEC	45	0	0	45	90	3	40	60	100
6	24EEE12	Embedded System Design	PEC	45	0	0	45	90	3	40	60	100
VERTICAL 3: POWER ENGINEERING												
1	24EEE13	Power Plant Engineering	PEC	45	0	0	45	90	3	40	60	100
2	24EEE14	Power System Operation and Control	PEC	45	0	0	45	90	3	40	60	100
3	24EEE15	High Voltage Engineering	PEC	45	0	0	45	90	3	40	60	100
4	24EEE16	High Voltage Direct Current Transmission	PEC	45	0	0	45	90	3	40	60	100
5	24EEE17	Smart Grid	PEC	45	0	0	45	90	3	40	60	100
6	24EEE18	Power Quality	PEC	45	0	0	45	90	3	40	60	100
VERTICAL 4: POWER ENGINEERING												
1	24EEE19	Industrial Electronics	PEC	45	0	0	45	90	3	40	60	100
2	24EEE20	Solid State Drives	PEC	45	0	0	45	90	3	40	60	100
3	24EEE21	Power Electronics for Renewable Energy Sources	PEC	45	0	0	45	90	3	40	60	100
4	24EEE22	Design of Power Converters	PEC	45	0	0	45	90	3	40	60	100
5	24EEE23	Multilevel Power Converters	PEC	45	0	0	45	90	3	40	60	100
6	24EEE24	Installation of Solar and Wind Power Generation Systems	PEC	45	0	0	45	90	3	40	60	100

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				L	T	P	SL	Tot.		CA	ES	Total
VERTICAL 5: ADVANCED CONTROL												
1	24EEE25	Signals and Systems	PEC	45	0	0	45	90	3	40	60	100
2	24EEE26	Digital Signal Processing	PEC	45	0	0	45	90	3	40	60	100
3	24ECE13	Digital Image Processing	PEC	45	0	0	45	90	3	40	60	100
4	24EEE27	Advanced Control System	PEC	45	0	0	45	90	3	40	60	100
5	24EEE28	Artificial Intelligence and Machine Learning	PEC	45	0	0	45	90	3	40	60	100
6	24EEE29	Virtual Instrumentation	PEC	45	0	0	45	90	3	40	60	100
VERTICAL 6: INDUSTRIAL AUTOMATION												
1	24EEE30	Soft Computing	PEC	45	0	0	45	90	3	40	60	100
2	24EEE31	Intelligent Control of Electric Vehicles	PEC	45	0	0	45	90	3	40	60	100
3	24EEE32	Energy Auditing and Management	PEC	45	0	0	45	90	3	40	60	100
4	24EEE33	Robotics Engineering	PEC	45	0	0	45	90	3	40	60	100
5	24EEE34	PLC Programming	PEC	45	0	0	45	90	3	40	60	100
6	24EEE35	Sensor Concepts and Techniques	PEC	45	0	0	45	90	3	40	60	100
MANDATORY COURSE – I, II & III												
1	24MCP09	Yoga for Stress Management	MC	0	0	30	0	30	0	-	-	-
2	24MCT01	Constitution of India	MC	30	0	0	0	30	0	100	-	100
3	24MCT02	Environmental Science and Sustainability	MC	30	0	0	0	30	0	100	-	100
4	24MCT03	Introduction to Gender Studies	MC	30	0	0	0	30	0	100	-	100
5	24MCT04	Life Science for Engineers	MC	30	0	0	0	30	0	100	-	100
6	24MCT05	Industrial Safety	MC	30	0	0	0	30	0	100	-	100
7	24MCT06	Essence of Indian Knowledge System	MC	30	0	0	0	30	0	100	-	100
8	24MCT07	Elements of Literature	MC	30	0	0	0	30	0	100	-	100
9	24MCT08	Disaster Management	MC	30	0	0	0	30	0	100	-	100

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S. No.	Course Code	Course Title	Category	Periods / Semester					C= T/30	Max. Marks		
				L	T	P	SL	Tot.		CA	ES	Total
OPEN ELECTIVES OFFERED BY OTHER DEPARTMENTS												
1	24AUO01	Basics of Automobile Engineering	OEC	45	0	0	45	90	3	40	60	100
2	24AUO02	Hybrid Vehicles	OEC	45	0	0	45	90	3	40	60	100
3	24BMO01	Basics of Biomedical Instrumentation	OEC	45	0	0	45	90	3	40	60	100
4	24BMO02	Biometric Systems	OEC	45	0	0	45	90	3	40	60	100
5	24CEO01	Smart Buildings	OEC	45	0	0	45	90	3	40	60	100
6	24CEO02	Climate Change	OEC	45	0	0	45	90	3	40	60	100
7	24CSO01	Data Structures and Algorithms using C	OEC	45	0	30	45	120	4	50	50	100
8	24CSO02	Fundamentals of Java Programming	OEC	15	0	90	15	120	4	50	50	100
9	24CSO03	Full Stack Framework	OEC	45	0	0	45	90	3	40	60	100
10	24CSO04	Digital Marketing	OEC	45	0	0	45	90	3	40	60	100
11	24CBO01	Ethical Hacking	OEC	45	0	0	45	90	3	40	60	100
12	24CBO02	Digital and Mobile Forensics	OEC	45	0	0	45	90	3	40	60	100
13	24CBO03	Applied Java Programming	OEC	15	0	90	15	120	4	50	50	100
14	24CSO06	Data Science Fundamentals	OEC	45	0	0	45	90	3	40	60	100
15	24CSO07	Artificial Intelligence and Machine learning	OEC	45	0	0	45	90	3	40	60	100
16	24CSO08	Data Exploration and Visualization	OEC	45	0	0	45	90	3	40	60	100
17	24IOO01	Industrial Internet of things	OEC	45	0	0	45	90	3	40	60	100
18	24IOO02	Introduction to Sensors and IoT	OEC	45	0	0	45	90	3	40	60	100
19	24ECO01	Drone Technology	OEC	45	0	0	45	90	3	40	60	100
20	24ECO02	Wearable Devices	OEC	45	0	0	45	90	3	40	60	100
21	24ECO03	5G /6G Communication	OEC	45	0	0	45	90	3	40	60	100
22	24ECO04	Embedded IoT	OEC	45	0	0	45	90	3	40	60	100
23	24ITO01	Introduction to Mobile Application Development	OEC	45	0	0	45	90	3	40	60	100
24	24ITO02	Fundamentals of Big Data Analytics	OEC	45	0	0	45	90	3	40	60	100
25	24ITO03	Augmented Reality / Virtual Reality (AR/VR)	OEC	45	0	0	45	90	3	40	60	100
26	24MEO01	3D Printing	OEC	45	0	0	45	90	3	40	60	100
27	24MEO02	Robotics and Automation	OEC	45	0	0	45	90	3	40	60	100
28	24MEO03	Lean Manufacturing	OEC	45	0	0	45	90	3	40	60	100
29	24SFO01	Occupational Health and Safety	OEC	45	0	0	45	90	3	40	60	100
30	24SFO02	Electrical Safety	OEC	45	0	0	45	90	3	40	60	100

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S. No.	Course Code	Course Title	Category	Periods / Semester					C= T/30	Max. Marks		
				L	T	P	SL	Tot.		CA	ES	Total
31	24SFO03	Building Fire Safety	OEC	45	0	0	45	90	3	40	60	100
32	24SFO04	Construction Safety	OEC	45	0	0	45	90	3	40	60	100
OPEN ELECTIVES OFFERED TO OTHER DEPARTMENTS												
33	24EEO01	Solar and Wind Energy System	OEC	45	0	0	45	90	3	40	60	100
34	24EEO02	Hydrogen and Hybrid Energy Storage Systems	OEC	45	0	0	45	90	3	40	60	100
35	24EEO03	Electric Vehicle Technology	OEC	45	0	0	45	90	3	40	60	100
36	24EEO04	Energy Conservation and Management	OEC	45	0	0	45	90	3	40	60	100

COURSE COMPONENT SUMMARY

S. No.	Category	Credits Per Semester								Credits Total	Percentage Credits
		I	II	III	IV	V	VI	VII	VIII		
1.	HSMC	4	2	-	3	-	3	-	-	12	7.19
2.	BSC	12	4	4	4	-	-	-	-	24	14.37
3.	ESC	7	4	1	1	-	-	-	-	13	7.78
4.	PCC	-	10	18	11.5	18	8.5	4	-	70	41.92
5.	PEC	-	-	-	-	3	6	9	-	18	10.78
6.	OEC	-	-	-	3	3	3	-	-	9	5.39
7.	EEC	1	1	1	2	2	4	2	8	21	12.57
8.	MC	√	-	-	-	√	√	-	-	0	0
TOTAL		24	21	24	24.5	26	24.5	15	8	167	100

Total No. of Credits = 167

Total No. of Credits for the Lateral Entry Student = 122

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24ENT19	PROFESSIONAL COMMUNICATION	Category	L	T	P	SL	C
		HSMC	45	0	0	45	3

(Common to All Branches)

PRE-REQUISITE:

A comprehensive understanding of basic English grammar, vocabulary, and sentence structure with familiarity in Communication and Technical Writing are considered as pre-requisite for the course.

OBJECTIVE:

To equip learners with essential verbal and written communication skills, including technical writing, necessary for academic, professional, and workplace success.

UNIT - I	UNDERSTANDING COMPARISONS AND CONTRASTS	(9)

Reading: Technical brochures, telephone messages, social media messages.

Writing: Emails/letters introducing oneself, Compare and Contrast Essay.

Grammar: Present Tenses, Framing WH and Yes-No questions.

Vocabulary: Portmanteau words, One–word substitutions.

UNIT - II	WRITING REPORTS AND PARAGRAPHS	(9)

Reading: Technical texts, biographies, travelogues, travel & technical blogs.

Writing: Paragraph writing, Short Report on an event/industrial visit.

Grammar: Past Tenses, Active & Passive Voice transformations, Prepositions.

Vocabulary: Word formations using Prefixes & Suffixes.

UNIT - III	DESCRIBING THE PROCESS/PRODUCT	(9)

Reading: Advertisements, gadget reviews, user manuals, news reports.

Writing: Definitions, Instructions, Product/Process description, Checklists.

Grammar: Future Tenses, If clauses, Concord.

Vocabulary: Nominal Compounds, Discourse Markers (connectives & sequence words).

UNIT - IV	TRANSCODING AND RECOMMENDATIONS	(9)

Reading: Newspaper articles, Journal reports.

Writing: Recommendations, Transcoding.(Conversion of non-verbal to verbal information)

Grammar: Articles, Relative pronouns, Modals.

Vocabulary: Collocations, Homonyms.

UNIT - V	SUMMATION AND DESCRIPTION	(9)

Reading: Editorials and Opinion blogs, Company profiles.

Writing: Descriptive/Narrative Essays, Job/Internship Application with Resume.

Grammar: Numerical adjectives, Relative Clauses.

Vocabulary: Cause & Effect Expressions, Homophones.

TOTAL (T:45 , SL:45) = 90 PERIODS

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COURSE OUTCOMES:

At the end of the course, the learners will be able to:

COs	Course Outcome	Cognitive Level
CO1	Recognize the structure of comparison texts using correct tenses and appropriate vocabulary.	Understand
CO2	Construct short paragraphs and reports using past tense and clear expressions.	Understand
CO3	Comprehend processes and products using future forms and appropriate vocabulary.	Understand
CO4	Interpret visuals like charts or graphs to produce well-structured written content.	Understand
CO5	Draft essays and job applications clearly, using proper grammar and structure.	Understand

TEXT BOOKS:

1. English for Engineers & Technologists, Orient Blackswan Private Ltd. Department of English, Anna University, 2023.
2. Nitin Bhatnagar, Communicative English for Engineers and Professionals, Pearson, 2024.

REFERENCES:

1. Dr. K.N. Shoba, and Dr. Lourdes Joevani, English for Science & Technology-II Cambridge University Press. Francis, Department of English, Anna University, 2023.
2. Lakshminarayanan, A Course Book on Technical English, Scitech Publications (India) Pvt. Ltd.2022.
3. Kulbhusan Kumar, RS Salaria, Effective Communication Skill, Khanna Publishing House, 2023.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	-	-	-	-	-	-	2	3	-	3	-	-
CO2	-	-	-	-	-	-	-	2	3	-	3	-	-
CO3	-	-	-	-	-	-	-	2	3	-	3	-	-
CO4	-	-	-	-	-	-	-	2	3	-	3	-	-
CO5	-	-	-	-	-	-	-	2	3	-	3	-	-

1-Low, 2-Medium, 3-High

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24GET19	தமிழர்மரபு	CATEGORY	L	T	P	SL	C
		HSMC	15	0	0	15	1

(அனைத்து துறைகளுக்கும் பொதுவானது)

முன்கூட்டிய துறைசார் அறிவு : தேவை இல்லை

அலகு – I	மொழி மற்றும் இலக்கியம்	[03]

இந்திய மொழிக் குடும்பங்கள் – திராவிட மொழிகள் – தமிழ் ஒரு செம்மொழி – தமிழ் செவ்விலயக்கிகியங்கள் – சங்க இலக்கியத்தின் சமயச்சார்பற்ற தன்மை – சங்க இலக்கியத்தில் பகிர்தல் அறம் – திருக்குறளில் மேலாண்மைக் கருத்துக்கள் – தமிழ் காப்பியங்கள், தமிழகத்தில் சமணபௌத்த சமயங்களின் தாக்கம் – பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் – சிற்றிலகியங்கள் தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி – தமிழ் இலக்கியவளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு – II	மரபு – பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக் கலை	[03]

நடுகல் முதல் நவீன சிற்பங்கள் வரை – ஐம்பொன் சிலைகள் – பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் – தேர் செய்யும் கலை – சுடுமண் சிற்பங்கள் – நாட்டுப்புறத் தெய்வங்கள் – குமரிமுனையில் திருவள்ளுவர் சிலை – இசை கருவிகள் – மிருதங்கம், பறை. வீணை. யாழ். நாதஸ்வரம் – தமிழர்களின் சமூகபொருளாதார வாழ்வில் கோவில்களின் பங்கு.

அலகு – III	நாட்டுப் புறக் கலைகள் மற்றும் வீர விளையாட்டுக்கள்	[03]

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஒயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

அலகு – IV	தமிழர்களின் திணைக் கோட்பாடுகள்	[03]

தமிழகத்தின் தாவரங்களும், விலங்குகளும் – தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் – தமிழர்கள் போற்றிய அறக்கோட்பாடு - சங்கக்காலத்தில் தமிழகத்தில் எழுத்தறிவும் கல்வியும் – சங்ககால நகரங்களும் துறை முகங்களும் – சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – கடல் கடந்த நாடுகளில் சோழர்களின் வெற்றி.

அலகு – V	இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு	[03]

இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறபகுதிகளில் தமிழ் பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில் சித்தமருத்துவத்தின் பங்கு கல்வெட்டுகள் கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்கள்களின் அச்சு வரலாறு.

Total (L= 15, SL=15) =30 Periods

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பாடம் கற்றத்தின் விளைவுகள்:பாடத்தை வெற்றிகரகமாக கற்று முடித்த பின்பு, மாணவர்களால் முடியும் விளைவுகள்		அறிவாற்றல் நிலை
CO1:	தமிழ்மொழியின் செந்ததன்மை மற்றும் இலக்கியம் குறித்த தெரிதல்	புரிதல்
CO2:	தமிழர்களின் சிற்பக்கலை, ஓவியக்கலை மற்றும் இசைக் கருவிகள் குறித்த தெளிவு.	புரிதல்
CO3:	தமிழர்களின் நாட்டுப் புரைக் கலைகள் மற்றும் வீரவிளையாட்டுகள் குறித்த தெளிவு	புரிதல்
CO4:	தமிழர்களின் திணைக் கோட்பாடுகள், சங்ககாலவணிகம் மற்றும் சோழர்களின் வெற்றிகள் குறித்த தகவல்கள்.	புரிதல்
CO5:	இந்திய தேசிய இயக்கம், சுயமரியாதை இயக்கம் மற்றும் சித்த மருத்தவம் பற்றிய புரிதல்.	புரிதல்

Text Books:

1	தமிழகவரலாறு-மக்களும்பண்பாடும்-கேகேபிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்) ,உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை, 2002
2	கணினித்தமிழ்முனைவர் இல. சுந்தரம், விகடன் பிரசுரம், 2016

Reference Books :

1	கீழடி-வைகை நதிக்கரையில் சங்ககால நகரநாகரிகம்.(தொல்லியல்துறைவெளியீடு)
2	பொருநை –ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)
3	Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)
4	Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	-	-	-	-	-	3	3	-	2	-	3	-	-
Avg.	-	-	-	-	-	**3**	**3**	-	**2**	-	**3**	-	-

1. சிறிது (குறைந்த) 2. மிதமான (நடுத்தர) 3. கணிசமான (உயர்)

Chairman (BoS)

K.S.R. College of Engineering for Academic Courses

24GET19	HERITAGE OF TAMILS	CATEGORY	L	T	P	SL	C
		HSMC	15	0	0	15	1

(Common to all branches)

Prerequisite(s): *No prerequisites are needed for enrolling into the course*

UNIT - I	LANGUAGE AND LITERATURE	[03]

Language Families in India - Dravidian Languages – Tamil as a Classical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.

UNIT - II	HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE	[03]

Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

UNIT - III	FOLK AND MARTIAL ARTS	[03]

Therukoothu, Karagattam, VilluPattu, KaniyanKoothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

UNIT - IV	THINAI CONCEPT OF TAMILS	[03]

Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

UNIT - V	CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE	[03]

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.

Total (L= 15, SL=15) =30 Periods

Course Outcomes: **At the end of the course, the student will be able to**		**Cognitive Level**
CO1:	Recognize the extensive literature of Tamil and its classical nature.	Understand
CO2:	Apprehend the heritage of sculpture, painting and musical instruments of ancient people.	Understand
CO3:	Review on folk and martial arts of Tamil people.	Understand
CO4:	Insight thinai concepts, trade and victory of Chozha dynasty.	Understand
CO5:	Realize the contribution of Tamil in Indian freedom struggle, self-esteem movement and siddha medicine.	Understand

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K.S.R. College of Engineering, Tiruchengode, Centre for Academic Courses

Text Books:	
1	Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)
2	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukarasu) (Published by : International Institute of Tamil Studies)
Reference Books:	
1	Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).
2	The Contribution of the Tamil to Indian Culture (Dr.M.Valarmathi) (Puplished by International Institute of Tamil Studies).
3	Keeladi – 'Sangam City Civilzation on the banks of river Vaigai; (Jointly Published by: Department of Archaeology & Tamilnadu Text Book and Educational Services Corporation, Tamilnadu)
4	Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by: The Author)

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	-	-	-	-	-	3	3	-	2	-	3	-	-
Avg.	-	-	-	-	-	**3**	**3**	-	**2**	-	**3**	-	-

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Chairman (BoS)

24MAI19	MATRICES AND CALCULUS	Category	L	T	P	SL	C
		BSC	45	0	30*	45	4

SEMESTER I - B.E / B.TECH (Common to All Branches)

PREREQUISITE:

The Students should have a basic understanding of calculus, matrices, and differential equations to effectively follow the concepts in this course.

OBJECTIVES:

Build a strong foundation in eigen values, eigen vectors, quadratic forms, and higher-order linear differential equations. Develop skills in differential and vector calculus to analyze curves, optimize multivariable functions, and interpret vector fields.

UNIT - I	LINEAR ALGEBRA	(9)

Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values and Eigen vectors (Excluding proof) – Cayley Hamilton theorem (excluding proof) – Quadratic forms – Reduction of quadratic form to canonical form by orthogonal transformation.

UNIT - II	ORDINARY DIFFERENTIAL EQUATIONS	(9)

Linear differential equations of second and higher order with constant coefficients – Differential equations with variable coefficients – Legendre's linear differential equations – Method of variation of parameters.

UNIT - III	DIFFERENTIAL CALCULUS	(9)

Curvature - Radius of curvature (Cartesian co-ordinates only) – Centre of curvature and Circle of curvature – Involutes and Evolutes (Parabola, Ellipse, Hyperbola and Rectangular hyperbola).

UNIT - IV	FUNCTIONS OF SEVERAL VARIABLES	(9)

Partial derivatives – Taylor's series expansion – Jacobians - Maxima and Minima for functions of two variables – Method of Lagrangian multipliers.

UNIT - V	VECTOR CALCULUS	(9)

Gradient, Divergence and Curl – Directional derivative – Irrotational and solenoid vector fields – Green's theorem in plane, Gauss divergence theorem and Stoke's theorem (Cube, Cuboid and Rectangular Paralleopiped only).

List of Experiments(R Software):

1. Calculate the characteristic equation and eigen values.
2. Find the eigenvector and diagonalization of a given matrix.
3. Solving ODE with constant coefficients.
4. Detect the solution of ODE with variable coefficients.
5. Identify the radius of curvature.
6. Reckon the Taylor's series for functions of two variables.
7. Estimate the divergence and curl.

* Alternative weeks : Tutorial and Laboratory

L = 45 , * P = 15 & *T = 15, SL = 45, TOTAL: 120 PERIODS

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K.S.R. College of Engineering, Centre for Academic Courses

COURSE OUTCOMES:
At the end of the course, the students will be able to:

COs	Course Outcome	Cognitive Level
CO1	Apply eigen values, eigen vectors, and the Cayley-Hamilton theorem to solve matrix problems and diagonalize quadratic forms into canonical form.	Apply
CO2	Apply methods to solve second and higher-order linear differential equations with constant and variable coefficients.	Apply
CO3	Apply concepts of differential calculus to find curvature, center of curvature, and evolutes of standard Cartesian conic sections.	Apply
CO4	Apply partial derivatives, Jacobians, and lagrangian multipliers to determine local extremum of multivariable functions.	Apply
CO5	Apply vector differential operators to the vector fields and verify Green's, Gauss divergence, and Stokes' theorems for geometries.	Apply

TEXT BOOKS:

1.Ravish R Singh and Mukul Bhatt, "Engineering Mathematics – I", Mc-Graw Hill Publications, New Delhi, 2nd Edition, 2020.
2.B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 40th Edition, 2020.

REFERENCES:

1. Bali N. P and Manish Goyal, "Engineering Mathematics", Laxmi Publications Pvt Ltd., 7th Edition, 2020.
2.Dass H.K, "Advance Engineering Mathematics", S. Chand and company, 11th Edition, 2014.
3. Jain R.K. and Iyengar S.R.K," Advanced Engineering Mathematics", Narosa Publications, 8th Edition, 2012.
4.Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley India, New Delhi, 10th Edition 2016.
5.https://archive.nptel.ac.in/courses/111/108/111108157/

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	3	3	2	-	-	1	-	-	2	-	-
CO2	3	3	3	3	2	-	-	1	-	-	2	-	-
CO3	3	3	3	3	2	-	-	1	-	-	2	-	-
CO4	3	3	3	3	2	-	-	1	-	-	2	-	-
CO5	3	3	3	3	2	-	-	1	-	-	2	-	-

1-low, 2-medium, 3-high

LIST OF EQUIPMENTS (For a Batch of 30 Students)

S.No.	Name of the Equipments	Quantity
1.	A computer with Intel (R) Core (TM) i3 – 2130 CPU @ 3.40GHZ processor and 4 GB RAM – DDR3.	30 Nos.
2.	R software (Open source)	30 Nos.

Chairman (BoS)

24PHI07	ENGINEERING PHYSICS	Category	L	T	P	SL	C
		BSc	45	-	30	45	4

(Common to AIDS, BME,CSE,CSE(IoT),CS,ECE,EEE &IT)

PREREQUISITE: The students must have knowledge about basic concepts of light sources, dual nature of radiation, conductivity of metals, semiconducting materials, different types of magnetic materials, super conducting materials and their applications.

OBJECTIVES: To provide a comprehensive understanding of the fundamental principles, mechanisms, applications of lasers, fiber optics, quantum physics, semiconductors, magnetic materials and superconductors in modern Science and technology.

UNIT – I **LASER AND FIBRE OPTICS** **(9)**

Lasers: Principles of spontaneous emission and stimulated emission - Einstein's co-efficient A & B– population inversion – CO_2 laser – semiconductor diode laser – homo – junction & hetero – junction (qualitative analysis only) – applications.

Fibre Optics: propagation of light in optical fibre– numerical aperture and acceptance angle – types of optical fibre (materials, refractive index profile and modes of propagation) – applications -fibre optic sensors: pressure and displacement sensors.

UNIT – II **QUANTUM MECHANICS** **(9)**

Introduction – black body radiation– Planck's theory (derivation) – deduction of Wien's displacement law and Rayleigh – Jean's Law from Planck's theory– Compton effect (derivation) – de-Broglie concept of matter waves – physical significance of a wave function – Schrödinger wave equations (Time dependent & time independent) – particle in a box (one dimensional).

UNIT – III **CONDUCTING MATERIALS** **(9)**

Classical free electron theory – expression for electrical conductivity – thermal conductivity – Wiedemann-Franz law – drawbacks of classical free electron theory – quantum theory – Fermi energy – Fermi -Dirac distribution function – density of states and carrier concentration of metals.

UNIT – IV **SEMICONDUCTING MATERIALS** **(9)**

Introduction – Intrinsic semiconductor: carrier concentration in an intrinsic semiconductor– Fermi level of an intrinsic semiconductor– variation of Fermi energy level with temperature – Extrinsic semiconductors: carrier concentration in n– type and p-type semiconductors (qualitative analysis only)– Fermi level of extrinsic semiconductors– variation of Fermi energy level with temperature and carrier concentration in an extrinsic semiconductors – Hall effect – determination of Hall co-efficient for n – and p – type semiconductors– applications.

UNIT – V **MAGNETIC AND SUPERCONDUCTING MATERIALS** **(9)**

Magnetic Materials: Introduction – origin of magnetic moment – dia, para and ferromagnetic martials– domain theory of ferro-magnetism – Hysteresis – soft and hard magnetic materials.

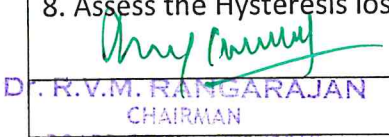
Superconducting Materials: Introduction to superconductivity – properties and types of superconductor – application of superconductors: magnetic levitation– SQUIDS– cryotron.

List of exercises/experiments:

1. Determine the thickness of the given thin paper using Air wedge method.
2. Find the acceptance angle and numerical aperture of a given optical fibre.
3. Evaluate the wavelength of semiconductor laser.
4. Estimate the particle size of the lycopodium powder using semiconductor laser
5. Enumerate the thermal conductivity of a bad conductor by Lee's disc method.
6. Compute the band gap of an intrinsic semiconductor.
7. Calculate the width of the CD groove with a help of semiconductor laser.
8. Assess the Hysteresis loss of magnetic materials using B-H curve.

K.S.R. College of Engineering, Tiruchengode-637215. Centre for Academic Courses

Dr. R.V.M. RANGARAJAN
CHAIRMAN
BOARD OF STUDIES (S&H)
K.S.R. COLLEGE OF ENGINEERING
TIRUKSAGE-Curriculum and Syllabi (R 2024)



Lecture: 45, Laboratory: 30, SL:45, TOTAL: 120 PERIODS

Course Outcomes:

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

COs	Course Outcome	Cognitive level
CO1	Elucidate laser principles, types, light propagation and the applications of optical fibers.	Understand
CO2	Apply quantum theory for Planck's theory, Compton Effect and Schrödinger's equation of matter waves.	Apply
CO3	Calculate electrical conductivity and Fermi energy by considering quantum free electron theory.	Apply
CO4	Infer charge carrier behavior in intrinsic, extrinsic semiconductors and Hall effect.	Understand
CO5	Describe principles, classifications, applications of magnetic materials and superconductors.	Understand

Text Books :

1. M.N. Avadhanulu and P.G. Kshirsagar, "A text book of Engineering Physics", S. Chand and Company, New Delhi, 11th Edition, 2018.
2. R.K. Gaur & S.L. Gupta, "Engineering Physics", Dhanpat Rai Publication, New Delhi, 7th Edition, 2014.

Reference Books :

1. R. Murugeshan and Kiruthiga Sivaprasath, "Modern Physics", S. Chand & Company, New Delhi, 17th Edition, 2014.
2. V. Rajendran, "Engineering Physics", Tata McGraw-Hill, New Delhi, 1st Edition, 2011.
3. S.O. Pillai, "Solid State Physics", New Age Publication, Chennai, 10th Edition, 2023.
4. Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, "Concepts of Modern Physics", McGraw-Hill, New Delhi, 7 th Edition, 2015.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO 1	PSO 2
CO1	3	2	-	-	-	-	1	2	2	-	2	-	-
CO2	3	3	2	-	-	-	1	2	2	-	2	-	-
CO3	3	3	2	-	-	-	1	2	2	-	2	-	-
CO4	3	2	-	-	-	-	1	2	2	-	2	-	-
CO5	3	2	-	-	-	-	1	2	2	-	2	-	-
Avg.	3	2	-	-	-	-	1	2	2	-	2	-	-

1-low, 2-medium, 3-high

BoS chairman

Chairman (BoS)

K.S.R. College of Engineering, Tiruchengodu-637 215. Centre for Academic Courses

24PHI07 - ENGINEERING PHYSICS
I Year B.E (AIDS, BME, CSE, CSE (IOT), CS, ECE, EEE & B.Tech IT)
Requirements for a batch of 30 students
Regulation (2024)

S.No.	Description of Equipment	Quantity required
1.	Air wedge apparatus. (with traveling microscope and accessories)	5 Nos
2.	Acceptance angle and numerical aperture of an optical fibre. (with accessories)	5 Nos
3.	Wavelength of semiconductor laser beam. (with accessories)	5 Nos
4.	Particle size of Lycopodium powder. (with accessories)	5 Nos
5.	Lee's disc apparatus. (with accessories)	5 Nos
6.	Band gap apparatus. (with accessories)	5 Nos
7.	Width of the groove of CD using laser. (with accessories)	5 Nos
8.	B-H curve apparatus. (with accessories)	5 Nos

BoS chairman

Chairman (BoS)

K.S.R. College of Engineering, Centre for Academic Courses, Tiruchengode-637215.

24CHI06	CHEMISTRY FOR ENGINEERS	Category	L	T	P	SL	C
		BSC	45	0	30	45	4

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

PREREQUISITE

The students must have knowledge about the basic concepts of water parameters, electro chemistry, organic reactions and their applications.

OBJECTIVES:

To equip the leaners to apply the chemical principles and their applications in the engineering fields.

UNIT - I WATER TREATMENT (9)

Hardness – types, units – estimation of hardness by EDTA method; Boiler feed water – requirements, disadvantages of using hard water in boilers – scale and sludge – priming and foaming – caustic embrittlement – boiler corrosion. Softening methods – internal conditioning – calgon, phosphate – external conditioning – zeolite process and ion exchange process; Desalination – reverse osmosis. Domestic water treatment (Sterilisation process Only).

UNIT - II ELECTROCHEMISTRY AND CORROSION (9)

Introduction – electrode potential – Nernst equation – EMF series and its significance; E – Vehicles - Need - Types – Advantages and Disadvantages; Corrosion – causes, consequences – classification – chemical corrosion – electro chemical corrosion – mechanism; Galvanic & differential aeration corrosion – factors influencing corrosion – corrosion control (Sacrificial anode and Impressed Current Cathodic protection method).

UNIT - III ENERGY STORAGE DEVICES (9)

Batteries – primary battery – Dry cell, secondary batteries – lead-acid and lithium-ion batteries. Fuel cells – H_2-O_2 fuel cell, solar cells – principle, applications and advantages; Nuclear energy: Light water Nuclear power plant - breeder reactor.

UNIT - IV POLYMER CHEMISTRY (9)

Polymer – definition – degree of polymerization – functionality. Polymerization – addition, condensation and co-polymerization – free radical mechanism of addition polymerization; Preparation properties & uses of PVC, Nylon – 6,6 & Teflon. Plastics – classification – thermosetting and thermoplastics. Fabrication of polymers – compression and Injection moulding.

UNIT - V NANO CHEMISTRY AND COMPOSITES (9)

Introduction – basics of nanochemistry – distinction between nanoparticles, molecules and bulk materials - synthesis of nanomaterials [CVD, laser evaporation, pyrolysis] - applications of nanomaterials. Composite – Introduction: Definition and need for composite – Types of composites: Properties and application of FRP and MMC.

List of Exercise/Experiments:

1. Estimation of total, permanent and temporary hardness of water sample By EDTA method
2. Estimation of chloride content in water by Argentometric method [Mohr's Method]
3. Conductometric titration of strong acid with strong base (HCl Vs NaOH)
4. Estimation of dissolved oxygen in water (Winkler's Method)
5. Conductometric titration of mixture of acids (HCl & CH_3COOH) with strong base
6. Estimation of Fe^{2+} ion by potentiometric titration
7. Estimation of HCl by p^H- Metry
8. Conductometric precipitation titration using $BaCl_2$-Na_2SO_4

L = 45, P = 30, SL = 45, TOTAL = 120 PERIODS

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K.S. College of Engineering. Tiruchengode-637 215. Centre for Academic Courses

COURSE OUTCOMES:
At the end of the course, the students will be able to:

COs	Course Outcome	Cognitive Level
CO1	Interpret the treatment solutions for drinking water, boiler feed water, and wastewater reuse.	Understand
CO2	Describe different types of electrochemical cells, including galvanic and electrolytic cells.	Understand
CO3	Categorize different energy storage methods, such batteries, fuel cell and solar cell for the production of electricity.	Understand
CO4	Summarize the basics concepts of polymer chemistry in designing the materials for engineering and technology.	Understand
CO5	Illustrate the nano materials and composites for engineering and technology.	Understand

TEXT BOOKS:

1. S S. Dara and S. S. Umare, "A Text book of Engineering Chemistry", S.Chand & Co.Ltd., 12th Edition, 2015.
2. P.C. Jain and Monica Jain, "Engineering Chemistry", Dhanpat Rai Pub. Co., 16th Edition, 2013.
3. Wiley, "Engineering Chemistry", Wiley India Pvt. Ltd., 2nd Edition, 2013.

REFERENCES:

1. Dr. A. Ravikrishnan, "Engineering Chemistry", Srikrishna Hi-tech Publishing Company Pvt. Ltd., 21st Edition, 2022.
2. J. Mendham, R. C. Denney, J. D. Barnes, M. J. K. Thomas and B. Sivasankar, "Vogel's Text book of Quantitative Chemical Analysis", Pearson Education Pvt., Ltd., 6th Edition, 2019.
3. Shashi Chala, "A Text book of Engineering Chemistry", Dhanpat Rai Pub. Co., 2015.
4. S. K. Bhasin and Sudha Rani, "Laboratory Manual of Engineering Chemistry", Dhanpat Rai Publishing Company Private Limited,3rd Edition, 2012.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO 1	PSO 2
CO1	3	2	-	-	-	1	-	2	1	-	1	-	-
CO2	3	2	-	-	-	1	-	2	1	-	1	-	-
CO3	3	2	-	-	-	1	-	2	1	-	1	-	-
CO4	3	2	-	-	-	1	-	2	1	-	1	-	-
CO5	3	2	-	-	-	1	-	2	1	-	1	-	-

1-low, 2-medium, 3-high

Laboratory Equipment Details
(Requirements for a batch of 30 students)

S.No.	Description of Equipment	Quantity required
1.	Electronic balance	1 No.
2.	pH meter	6 Nos.
3.	Conductivity meter	6 Nos.
4.	Potentiometer	6 Nos.

Chairman (BoS)

K.S.R. College of Engineering, Centre for Academic Courses

24ITI16	PROGRAMMING FOR PROBLEM SOLVING	Category	L	T	P	SL	C
		ESC	15	0	90	15	4

(COMMON TO AI&DS,BME,CSE,CS,ECE,EEE,IOT & IT)

PREREQUISITE:

A basic grasp of computer concepts is essential. Familiarity with logical thinking and simple algorithm design is recommended.

OBJECTIVES:

To enable students to understand the fundamentals of C programming and develop problem-solving skills. The course focuses on writing structured programs using control statements, functions, arrays, pointers, structures and file operations.

UNIT - I	C PROGRAMMING BASICS	(21)

Structure of C program -- C Character set - Identifies and Keywords - Data Types – Declarations- Expressions - Statements and Symbolic constants. Operators: Arithmetic Operators - Unary operators - Relational and Logical Operators - Assignment operators - Conditional operators. Unformatted and formatted Input/output functions - pre-processor directives and storage classes. **(Theory-3)**

List of Exercise:

1. Display Student Details Using Formatted I/O.
2. Arithmetic Operations on Two Numbers.
3. Check Whether a Number is Positive, Negative or Zero.
4. Find the Greatest of Three Numbers.
5. Grade Calculation Using Conditional Operator.
6. Temperature Conversion between Celsius and Fahrenheit.
7. Determine Whether a Number is Odd or Even.
8. Character Classification: Letter, Digit or Symbol.
9. Demonstrate Use of Storage Classes in C.
10. Macro Definition and Preprocessor Directive Example. **(Laboratory-18)**

UNIT - II	CONTROL STATEMENTS, ARRAYS AND STRING	(21)

Conditional statements - Unconditional statements - branching and looping statements - Arrays - Initialization - Declaration - One dimensional and Two dimensional arrays. String: String operations - String Arrays. Simple programs – sorting - searching - matrix operations. **(Theory-3)**

List of Exercise:

1. Check Whether a Number is Prime Using Looping Statements.
2. Generate Fibonacci Series Using Conditional and Looping Constructs.
3. Find Factorial of a Number Using while and for Loops.
4. Sum and Average of Elements in a One Dimensional Array.
5. Find the Largest and Smallest Elements in an Array.
6. Sort Array Elements in Ascending Order (Bubble Sort).
7. Search for an Element in an Array Using Linear Search.
8. Matrix Addition and Subtraction Using Two Dimensional Arrays.
9. Perform Matrix Multiplication Using Nested Loops.
10. String Manipulation: Concatenate, Reverse and Find Length of a String. **(Laboratory-18)**

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UNIT - III	FUNCTIONS AND POINTERS	(21)

Functions: Library functions and user defined functions - Function prototypes and function definitions - Call by value - Call by reference - Recursion – Pointer: Definition - Initialization - Pointers arithmetic - Pointers and arrays - Pointers and Functions - Dynamic memory Allocation - Example Programs. **(Theory-3)**

List of Exercise:

1. Create and Use User Defined Functions for Basic Arithmetic Operations.
2. Demonstrate Call by Value and Call by Reference Using Swap Function.
3. Find Factorial of a Number Using Recursion.
4. Generate Fibonacci Series Using Recursive Function.
5. Count Vowels and Consonants in a String Using User Defined Function.
6. Demonstrate Pointer Arithmetic with Arrays.
7. Pass Arrays to Functions Using Pointers.
8. Access and Modify Array Elements Using Pointers.
9. Allocate and Free Memory Using malloc, calloc and free.
10. Create a Program Using Function Pointer for Menu Driven Operations. **(Laboratory-18)**

UNIT - IV	STRUCTURES AND UNIONS	(21)

Need for structure data type - structure definition - Structure declaration - Structure within a structure - Passing structures to functions - Array of structures - Pointers to structures - Union - Programs using structures and Unions. **(Theory-3)**

List of Exercise:

1. Define and Display Student Details Using Structure.
2. Calculate and Display Employee Salary Using Structure.
3. Store and Display Book Details Using Array of Structures.
4. Pass Structure Variables to Functions for Processing Student Marks.
5. Nested Structure Example: Store and Display Address Information.
6. Use Pointer to Structure to Access and Modify Data.
7. Create a Program to Sort Student Records Using Array of Structures.
8. Compare Two Dates Using Structures.
9. Demonstrate the Use of Union to Store Multiple Data Types.
10. Create a Program Using Structure to Perform Complex Number Addition. **(Laboratory-18)**

UNIT - V	FILE MANIPULATIONS	(21)

Files: File operations- Binary files and text files - Types of File Processing - Sequential access - Random Access File - Command line arguments. Case Studies: GEMINI Operating System.**(Theory-3)**

List of Exercise:

1. Write and Read Data from a Text File.
2. Append New Records to an Existing Text File.
3. Count the Number of Characters, Words, and Lines in a File.
4. Copy Contents from One File to Another.
5. Store and Retrieve Student Records Using Binary Files.
6. Search a Specific Record in a Binary File (Random Access).
7. Update a Record in a Binary File Using File Pointers.
8. Delete a Specific Record from a File Using Temporary File Technique.
9. Display File Content Using Command Line Arguments.
10. Merge Two Text Files into a Single File Using File Operations. **(Laboratory-18)**

L= 15, T=0, P=90, SL=15, TOTAL: 120 PERIODS

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COURSE OUTCOMES:
At the end of the course, the learners will be able to:

COs	Course Outcome	Cognitive Level
CO1	Explain the use of console input and output functions in C programs.	Understand
CO2	Construct C programs using arrays, decision making and looping statements to solve basic problems.	Apply
CO3	Differentiate between call by value and call by reference while using functions and pointers in C.	Analyze
CO4	Implement real time applications using structures and unions to manage and organize complex data.	Apply
CO5	Assess the effectiveness of different file handling methods for managing data in real time applications.	Evaluate

TEXT BOOKS:

1. Deitel and Deitel, "C How to Program", Pearson Education, 9th Edition, March 2024.
2. Yashavant P. Kanetkar, "Let Us C", BPB Publications, 20th Edition, 2024.

REFERENCES:

1. Kernighan B.W and Ritchie D.M, "The C Programming language", Second Edition, Pearson Education, 2006.
2. Byron S Gottfried, "Programming with C", Schaum's Outlines, Second Edition, Tata McGraw-Hill, 2006.
3. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", Dorling Kindersley (India) Pvt. Ltd., Pearson Education in South Asia, 2011.
4. E. Balagurusamy, "Programming in ANSI C", seventh edition, Tata McGraw Hill, 2016.
5. Ashok N. Kamathane, 'Computer Programming,PearsonEducation,India,ThirdEdition,2015.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	-	-	-	2	-	1	-	-	-
CO2	3	3	2	-	2	-	-	2	-	1	-	-	-
CO3	3	3	3	2	-	-	-	2	-	1	-	-	-
CO4	3	3	3	3	2	-	-	2	-	2	1	-	-
CO5	3	3	3	3	3	-	-	2	-	2	2	-	-

1-low, 2-medium, 3-high

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24MEP16	ENGINEERING GRAPHICS LABORATORY	Category	L	T	P	SL	C
		ESC	15	0	30	15	2

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

PREREQUISITE

Engineering Graphics Laboratory requires a good understanding of geometry. This includes knowledge of shapes, angles, dimensions, and spatial reasoning. The ability to visualize and interpret three-dimensional objects from two-dimensional drawings is crucial.

OBJECTIVES:

Instruct the utility of drafting & modeling packages in orthographic and isometric drawings and train the usage of 2D and 3D modeling

List of Exercise/Experiments:

1. Study of drawing tools, commands and coordinate systems in 2D software.
2. Cycloid and Conic curves.
3. Orthographic projections of pictorial views.
4. Orthographic views of straight lines.
5. Orthographic views of planes.
6. Orthographic views of simple solids.
7. The sectional view and the true shape of simple solids.
8. Development of lateral surfaces of simple solids.
9. Isometric projection of simple solids.
10. Drafting the 2D multi-view drawings from 3D model.

LIST OF EQUIPMENT (for a batch of 30 Students)

S.No.	Name of the Equipment	Quantity
1.	Intel i3 Processor, 8 GB RAM with 2 GB Graphics Card	30 Nos
2.	Licensed software for drafting and modeling	30 Nos

L:15 P:30 SL:15 TOTAL: 60 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Exp. No.	Cognitive Level
CO1	Explain the fundamentals of engineering drawing and AutoCAD tool.	1	Understand
CO2	Construct projections of points, lines, and planes, then develop a virtual drawing using AutoCAD tool.	2,3 & 4	Apply
CO3	Apply projection principles to convert pictorial views into orthographic drawings	5,6	Apply
CO4	Model the Solid Projections and Sectioning of the solids by the AutoCAD tool.	7,8	Apply
CO5	Develop isometric drawings of simple objects reading the orthographic projections of those objects.	9,10	Apply

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REFERENCES:

1. Bhatt. N. D., Engineering Drawing, Charotar Publishing House, Fifty Third Edition, 2014.
2. Basant Agarwal and Agarwal. C. M., Engineering Drawing, Tata McGraw Hill Publishing Company Limited, 2018.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	3	-	-	-	-	-	-	-	-
CO2	3	3	2	-	3	-	-	-	-	-	-	-	-
CO3	3	3	2	-	3	-	-	-	-	-	-	-	-
CO4	3	3	2	-	3	-	-	-	-	-	-	-	-
CO5	3	3	2	-	3	-	-	-	-	-	-	-	-

1-low, 2-medium, 3-high

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24GEP16	ENGINEERING EXPERIENCE LABORATORY	Category	L	T	P	SL	C
		ESC	0	0	30	0	1

(Common to BME, CSE, CSE(CS), AIDS, CSE(IoT), ECE, EEE, IT)

PREREQUISITE:

A solid foundation in basic electrical components such as switches, wires, fuses, and light bulbs, including the roles of line, neutral, and ground wires. Basic understanding of physics and core principles of electrical and mechanical engineering.

OBJECTIVE:

To develop practical skills in basic electrical wiring, electronic interfacing with Arduino and IoT, and fundamental mechanical tools and systems.

LIST OF EXPERIMENTS

GROUP - A (ELECTRICAL)

1. Fluorescent lamp wiring.
2. Stair-case wiring.
3. Residential house wiring using switches, fuse, indicator and lamp.
4. Measurement of Energy in single phase system.

GROUP - B (ELECTRONICS)

1. Study of Electronic Components, Instruments, Internet of Things (IoT) and Arduino IDE.
2. Controlling the Light Emitting Diode (LED) with a push button using Arduino.
3. Interfacing of a Sensor (Ultrasonic, Rain, Voltage, Current & PIR) with Arduino Uno.
4. Controlling of LED through Wi-Fi using ESP8266.

GROUP - C (MECHANICAL)

1. Study of plumbing line sketches for water supply and carpentry tools.
2. Study of welding tools and centrifugal pump.

COURSE OUTCOMES:

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

COs	Course Outcome	Bloom's Taxonomy Level
CO1	Construct different types of wiring used in residential houses.	Apply
CO2	Measure the energy in single-phase system.	Apply
CO3	Demonstrate different electronic components, instruments, IoT and Arduino IDE.	Apply
CO4	Construct the control circuit with the help of Arduino and sensors.	Apply
CO5	Describe the plumbing, carpentry, welding components and centrifugal pump works for engineering practices and applications.	Understand

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REFERENCES:

1. Gupta J.P., "A Course in Electrical Installation Estimating and Costing", S.K. Kataria and Sons, Delhi, Reprint 2013 Edition, 2013.
2. Mike Cheich, "Arduino Book for Beginners", Programming Electronics Academy, 2021.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	-	-	2	2	3	2	-	3	-	-
CO2	3	3	2	-	-	2	2	3	2	-	3	-	-
CO3	3	3	2	-	-	-	2	3	2	-	3	-	-
CO4	3	3	2	-	-	-	2	3	2	-	3	-	-
CO5	3	3	2	-	-	-	2	3	2	-	3	-	-

LIST OF EQUIPMENT (For a Batch of 30 Students)

S.No.	Name of the Equipment	Qty.
1.	Single-phase house wiring setup	2 Nos.
2.	Staircase wiring setup	2 Nos.
3.	Fluorescent lamp wiring setup	2 Nos.
4.	Energy Meter	5 Nos.
5.	Electrical Measuring Instruments	10 Nos.
6.	Ultrasonic Sensor	5 Nos.
7.	Rain Sensor	5 Nos.
8.	Voltage Sensor	5 Nos.
9.	Current Sensor	5 Nos.
10.	PIR Sensor	5 Nos.
11.	ESP8266 & Cable	15 Nos.
12.	Arduino UNO & Cable	15 Nos.
13.	DHT 11	5 Nos.
14.	Temperature sensor	5 Nos.
15.	Red LED	15 Nos.
16.	2-leg push Button	15 Nos.
17.	4-leg push Button	15 Nos.
18.	Personal Computer	15 Nos.

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24SDP19	SOFT SKILLS DEVELOPMENT – I	Category	L	T	P	SL	C
		EEC	0	0	30	0	1

(Common to All Branches)

OBJECTIVES:

To introduce students to the fundamental concepts of aptitude, emphasizing its relevance in academic pursuits and career advancement. It also focuses on developing proficiency in verbal reasoning, which enhances the students' problem-solving abilities and critical thinking skills.

UNIT - I	NUMBER SYSTEM	(6)

Introduction to Number System and its Classification – Divisibility Rules and Problems – Remainder Theorem – HCF & LCM and its properties.

UNIT - II	NUMBERS	(6)

Introduction to Digits, Place value, Face value and Fractions – BODMAS Rule and Simplifications – Unit Digit, Squares and Cubes.

UNIT - III	AVERAGES	(6)

Introduction to Averages, Sum of Observations and Number of Observation – Average of Consecutive Numbers – Weighted Average – Change in Average – Averages in Real-life Scenarios.

UNIT - IV	LOGICAL REASONING	(6)

Analogies – Alphabet Series and Number Series – Directions and Distance.

UNIT - V	VERBAL ABILITY	(6)

Reading Comprehension – Synonyms and Antonyms – Sentence Formation – Paragraph Formation.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Explain the classification of number systems, apply divisibility rules to identify number properties, and understand the concepts of HCF and LCM.	Understand
CO2	Solve problems using face and place value, fractions, BODMAS and number properties.	Apply
CO3	Apply concepts of averages, to analyse and solve real-life and quantitative aptitude problems effectively.	Apply
CO4	Resolve problems with series & direction based logical reasoning.	Apply
CO5	Interpret passages to demonstrate reading comprehension, and explain the structure of correct sentence and paragraph formation.	Understand

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TEXT BOOKS:

1. R S Aggarwal, "Quantitative Aptitude for Competitive Examinations".
2. Abhijit Guha, "Quantitative Aptitude for Competitive Examinations".
3. Nishit K. Sinha, "Logical Reasoning and Data Interpretation for CAT".
4. R.S. Agarwal, "A Modern Approach to Verbal & Non-Verbal Reasoning".
5. Edgar Thorpe & Showick Thorpe, "English for Competitive Examinations".

REFERENCES:

1. Arun Sharma, Quantitative Aptitude for CAT, 11e, 2025.
2. Arun Sharma, Logical Reasoning for CAT, 7e, 2025.
3. Wren & Martin, High School English Grammar & Composition.
4. https://prepinsta.com/.
5. https://www.geeksforgeeks.org/quantitative-aptitude/?ref=shm.
6. https://www.youtube.com/@FeelFreetoLearn/playlists.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	2	-	-	2	-	-	3	-	-
CO2	3	3	2	-	2	-	-	2	-	-	3	-	-
CO3	3	3	2	-	2	-	-	2	-	-	3	-	-
CO4	3	3	2	-	2	-	-	2	-	-	3	-	-
CO5	3	2	-	-	2	-	-	3	3	-	3	-	-
Avg.	3	3	2	-	2	-	-	2	3	-	3	-	-

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24ECT21	DESIGN THINKING	Category	L	T	P	SL	C
		PCC	30	0	0	30	2

(COMMON TO BME, EEE & ECE)

PRE-REQUISITE: Nil

OBJECTIVE:

To equip learners with a structured, human-centered approach to problem-solving using the principles and stages of Design Thinking, including empathy, problem definition, ideation, prototyping, and effective communication.

UNIT - I	FUNDAMENTALS OF DESIGN THINKING	(6)

What is Design Thinking? - When to use Design Thinking? - How to do it? - Who are involved in this? – Design The Thinking™– Personal Visualization, The Wheel of Life & Balancing Priorities – Appreciating 'Design' – The 3 Laws of Design Thinking.

UNIT - II	STEP 1: THE 'FEEL' STAGE	(6)

What is this stage about? – What role does a Design Thinker play in this stage? Tools – What is the purpose in this stage? – Persona – Journey Mapping – Stakeholder Mapping & CATWOE Analysis - Cartographic Perspective (L0) – Empathy Map – Case Study: Understanding the Stakeholders.

UNIT - III	STEP 2: THE 'DEFINE' STAGE	(6)

What is this stage about? – What role does a Design Thinker play in this stage? – What is the most important aspect of this stage? – Tools – What is the purpose in this stage? – Five-Whys – Anti-Pattern – Paraphrasing the Problem – Challenge Mapping – LORD: Definitive skill set for a Design Thinker – Case Study: Relooking at the Problem.

UNIT - IV	STEP 3: THE 'DIVERGENCE' &'CONVERGENCE' STAGE	(6)

What is this stage about? – What role does a Design Thinker play in this stage? – What is the most important aspect of this stage? – Tools – What is the purpose in this stage? – Brainstorming – Metaphor – Random Association Technique – End-State Visualization - 10gm-100gm-1000gm – Prototyping – Wire framing for digital products – Case Study: Prototyping and Communicating for Effective Outcome.

UNIT - V	STEP 5: THE 'COMMUNICATION' STAGE	(6)

What is this stage about? – What role does a Design Thinker play in this stage? – What is the most important aspect of this stage? – Tools – What is the purpose in this stage? – The 4Cs Framework – Naming – Packaging – Story boarding – Presentation – Distribution.

TOTAL (L:30, SL:30): 60 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Demonstrate an understanding of Design Thinking concepts and principles by explaining their relevance in real-world contexts.	Understand
CO2	Articulate the significance of a Design Mindset and its impact on creative problem-solving.	Understand
CO3	Apply Design Thinking methods effectively at each stage of the problem-solving process.	Apply

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CO4	Identify and implement the phases of Design Thinking to address complex challenges systematically.	Apply
CO5	Use a variety of Design Thinking tools to develop innovative solutions and refine ideas through iteration.	Apply

TEXT BOOKS:

1. UnMukt – The Science & Art of Design Thinking, Arun Jain
2. Don Norman ,The Design of Everyday Things, MIT Press, 2013
3. Tim Brown, Change by Design: How Design Thinking Transforms Organizations and inspires innovation, Harper Collins Publishers Ltd, New York, First Edition, 2009.

REFERENCES:

1. Chrisitan Mueller-Roterberg, Handbook of Design Thinking – Tips & Tools for how to design thinking, kindle Direct Publishing, First Edition, 2018.
2. Johnny Schneider, Understanding Design Thinking, Lean and Agile, O'Reilly Media, California, First Edition, 2017
3. Roger Martin, The Design of Business, Why Design Thinking is the next competitive advantage, Harvard Business Press, United States, First Edition, 2009.
4. Idris Mootee, Design Thinking for Strategic Innovation, John Wiley & Sons Inc, New Jersey, First Edition, 2013.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	2	2	2	2	3	2	3	3	-	-
CO2	3	3	2	2	2	2	2	3	2	3	3	-	-
CO3	3	3	3	3	3	2	2	3	2	3	3	-	-
CO4	3	3	3	3	3	2	2	3	2	3	3	-	-
CO5	3	3	3	3	3	2	2	3	2	3	3	-	-

1-low, 2-medium, 3-high

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24GET29	தமிழரும் தொழில் நுட்பமும்	CATEGORY	L	T	P	SL	C
		HSMC	15	0	0	15	1

(அனைத்து துறைகளுக்கும் பொதுவானது)

முன் கூட்டிய துறைசார் அறிவு : தேவை இல்லை

அலகு – I	நெசவு மற்றும் பானைத் தொழில்நுட்பம்	[03]

சங்ககாலத்தில் நெசவுத் தொழில் – பானைத் தொழில்நுட்பம் கருப்பு சிவப்பு பாண்டங்கள்–பாண்டகளில் கீறல் குறியீடுகள்

அலகு – II	வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்	[03]

சங்ககாலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு – சங்க காலத்தில் கட்டுமானப் பொருட்களும் நடுகல்லும்–சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள்–மாமல்லபுரச் சிற்பங்களும், கோவில்களும்–சோழர்காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள்–நாயக்கர் காலக்கோயில்கள்–மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன்ஆலயம் மற்றும் திருமலைநாயக்கர்மஹால் – செட்டிநாட்டுவீடுகள்–பிரிட்டிஷ்காலத்தில் சென்னை இந்தோ-சாரோசெனிக் கட்டிடக் கலை.

அலகு – III	உற்பத்தித் தொழில்நுட்பம்	[03]

கப்பல் கட்டும் கலை–உலோகவியல்–இரும்புத்தொழிற்சாலை–இரும்பை உருக்குதல், எஃகு–வரலாற்றுச்சான்றுகளாக செம்பு மற்றும் தங்கநாணயங்கள்–நாணயங்கள் அச்சடித்தல்–மணி உருவாக்கும் தொழிற்சாலைகள்–கல் மணிகள்–கண்ணாடி மணிகள்–சுடு மண்மணிகள்–சங்குமணிகள்–எலும்புத்துண்டுகள்–தொல்லியல் சான்றுகள்–சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

அலகு – IV	வேளாண்மை மற்றும் நீர்ப் பாசனத் தொழில்நுட்பம்	[03]

அணை,ஏரி,குளங்கள்,மதகு–சோழர்காலகுமிழித்தூம்பின் முக்கியத்துவம்–கால்நடை பராமரிப்பு–கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள்–வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள்–கடல்சார் அறிவு – மீன் வளம்–முத்து மற்றும் முத்துக் குளித்தல்–பெருங்கடல் குறித்த பண்டைய அறிவு–அறிவுசார் சமூகம்.

அலகு – V	அறிவியல் தமிழ் மற்றும் கணினித்தமிழ்	[03]

அறிவியல் தமிழின் வளர்ச்சி– கணினித்தமிழ் வளர்ச்சி–தமிழ் நூல்களை மின்பதிப்பு செய்தல்–தமிழ் மென் பொருட்கள் உருவாக்கம்–தமிழ் இணையக்கல்விக் கழகம்–தமிழ் மின்நூலகம்–இணையத்தில் தமிழ் அகராதிகள் சொற்குவைத் திட்டம்.

Total (L= 15, SL=15) =30 Periods

பாடம் கற்றத்தின் விளைவுகள் : பாடத்தை வெற்றிகரகமாக கற்று முடித்த பின்பு, மாணவர்களால் முடியும் விளைவுகள்		அறிவாற்றல் நிலை
CO1	*சங்ககாலத் தமிழிர்களின் நெசவு மற்றும் பானைவனைதல் தொழில் நுட்பம் குறித்து கற்றுணர்தல்.*	*புரிதல்*
CO2	*சங்ககாலத் தமிழிர்களின் கட்டிட தொழில் நுட்பம் கட்டுமான பொருட்கள் மற்றும் அவற்றை விளகும் தளங்கள் குறித்து அறிவு.*	*புரிதல்*
CO3	*சங்ககாலத் தமிழிர்களின் உலோகத் தொழில், நாணயங்கள் மற்றும் மணிகள் சார்ந்த தொல்லியல் சான்றுகள் பற்றிய அறிவு.*	*புரிதல்*
CO4	*சங்ககாலத் தமிழிர்களின் வேளாண்மை, நீர்ப்பாசன முறைகள் மற்றும் முத்து குளித்தல் குறித்த தெளிவு.*	*புரிதல்*
CO5	*நவீன அறிவியல் தமிழ் மற்றும் கன்னி தமிழ் குறித்த புரிந்துகொள்ளலும் மற்றும் பயன்படுத்தலும்.*	*பகுப்பாய்வு*

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Text Books :	
1	தமிழகவரலாறு- மக்களும் பண்பாடும்- கேகேபிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்)
2	கணினித்தமிழ் - முனைவர் இல. சுந்தரம் (விகடன் பிரசுரம்)
Reference Books :	
1	கீழடி- வைகை நதிக்கரையில் சங்ககால நகரநாகரிகம்.(தொல்லியல் துறை வெளியீடு)
2	பொருநை – ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)
3	Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by : The Author)
4	Porunai Civilization (Jointly Published by: Department of Archaeology &Tamilnadu Textbook and Educational Services Corporation, Tamilnadu)

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	-	-	-	-	-	3	3	-	2	-	3	-	-
Avg.	-	-	-	-	-	**3**	**3**	-	**2**	-	**3**	-	-

1. சிறிது (குறைந்த) 2. மிதமான (நடுத்தர) 3. கணிசமான (உயர்)

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24GET29	TAMILS AND TECHNOLOGY	CATEGORY	L	T	P	SL	C
		HSMC	15	0	0	15	1

(Common to All Branches)

Prerequisite(s): *No prerequisites are needed for enrolling into the course*

UNIT - I	WEAVING AND CERAMIC TECHNOLOGY	[03]

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

UNIT - II	DESIGN AND CONSTRUCTION TECHNOLOGY	[03]

Designing and Structural construction House & Designs in household materials during Sangam Age – Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram– Sculptures and Temples of Mamallapuram– Great Temples of Cholas and other worship places – Temples of Nayaka Period – Type study (Madurai Meenakshi Temple) – ThirumalaiNayakar Mahal –Chetti Nadu Houses, Indo –Saracenic architecture at Madras during British Period.

UNIT - III	MANUFACTURING TECHNOLOGY	[03]

Art of Ship Building – Metallurgical studies – Iron industry – Iron smelting, steel – Copper and gold – Coins as source of history – Minting of Coins – Beads making – industries Stone beads – Glass beads –Terracotta beads –Shell beads/ bone beats – Archeological evidences – Gem stone types described in Silappathikaram.

UNIT - IV	AGRICULTURE AND IRRIGATION TECHNOLOGY	[03]

Dam, Tank, ponds, Sluice, Significance of KumizhiThoompu of Chola Period, Animal Husbandry – Wells designed for cattle use – Agriculture and Agro Processing – Knowledge of Sea – Fisheries – Pearl – Conche diving – Ancient Knowledge of Ocean – Knowledge Specific Society.

UNIT - V	SCIENTIFIC TAMIL & TAMIL COMPUTING	[03]

Development of Scientific Tamil – Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project.

Total (L= 15, SL=15) =30 Periods

Course Outcomes: **At the end of the course, the student will be able to**		***Cognitive Level***
CO1	Understand the weaving and ceramic technology of ancient Tamil People nature.	Understand
CO2	Comprehend the construction technology, building materials in sangam Period and case studies.	Understand
CO3	Infer the metal process, coin and beads manufacturing with relevant archeological evidence	Understand
CO4	Realize the agriculture methods, irrigation technology and pearl diving.	Understand
CO5	Apply the knowledge of scientific Tamil and Tamil computing.	Apply

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Text Books:	
1	Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)
2	Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).
Reference Books:	
1	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukarasu) (Published by : International Institute of Tamil Studies)
2	The Contribution of the Tamils to Indian Culture (Dr.M.Valarmathi)(Puplished by International Institute of Tamil Studies).
3	Keeladi – 'Sangam City Civilzation on the banks of river Vaigai; (Jointly Published by: Department of Archaeology &Tamilnadu Text Book and Educational Services Corporation, Tamilnadu)
4	Studies in the History of India with Special Reference to Tamilnadu (dr.K.K.Pillay) (Published by.: The Author)

Mapping of COs with POs and PSOs													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	-	-	-	-	-	3	3	-	2	-	3	-	-
Avg.	-	-	-	-	-	**3**	**3**	-	**2**	-	**3**	-	-

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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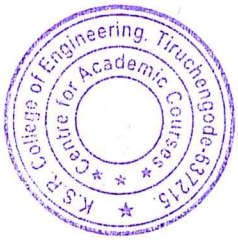

24EET21	ELECTRIC CIRCUIT ANALYSIS	Category	L	T	P	SL	C
		PCC	45	15	0	60	4

PREREQUISITE:

Basic knowledge in mathematics, algebra, trigonometry, complex numbers, and physics is needed. Additionally, knowledge of electrical components like resistors, capacitors, and inductors, along with basic tools for circuit diagram interpretation is essential.

OBJECTIVE:

- To understand and analyse the DC and AC circuits, network theorems, resonance, three-phase systems, and transient responses using appropriate methods and techniques.

UNIT - I	DC CIRCUITS	(9+3)

Basic definitions – Circuit terminologies – Ohm's law and its limitations – Kirchhoff's laws – Series and parallel resistive circuits – Voltage and current division techniques – Source transformation – Mesh current and Node voltage methods (Independent Sources).

UNIT - II	REDUCTION TECHNIQUES AND NETWORK THEOREMS	(9+3)

Star to delta and delta to star conversion – Thevenin's Theorem – Norton Theorem – Superposition Theorem – Maximum Power Transfer Theorem – Reciprocity Theorem (DC Circuits only).

UNIT - III	AC CIRCUITS	(9+3)

Characteristics of Sinusoids – Average and RMS Value – Form Factor – Peak Factor – Phase Difference – Phasor Representation – Series RL, RC and RLC Circuit: Impedance, Power, Active Power, Reactive Power and Power factor – Three Phase System: Advantages and Needs – Star and Delta connected balanced and unbalanced loads – Two wattmeter method of power measurements – Power Factor Calculations.

UNIT - IV	RESONANCE AND COUPLED CIRCUITS	(9+3)

Series Resonance Circuit: Phasor diagram – Properties – Q Factor – Half-power frequencies – Selectivity – Bandwidth.

Coupled Circuits: Self-Inductance – Mutual Inductance – Dot Convention – Coefficient of Coupling – Single-Tuned Circuits.

UNIT - V	TRANSIENT ANALYSIS	(9+3)

Laplace transform and inverse Laplace transform – Transient response of Series RL, RC and RLC circuits using Laplace Transforms for Source free, Step input and Sinusoidal input.

LECTURE: 45, TUTORIAL: 15, SELF LEARNING: 60, TOTAL: 120 PERIODS

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COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Solve the problems of DC circuits using fundamental laws.	Apply
CO2	Apply various network reduction techniques, including network theorems for simplifying the electric circuits.	Apply
CO3	Determine impedance, power and power factor of series AC circuits, and three-phase systems.	Apply
CO4	Apply the principles of resonance, magnetic circuits and analysis the circuit parameters.	Apply
CO5	Apply the fundamentals of Laplace transforms to determine transient responses of RL, RL, RLC electrical circuits.	Apply

TEXT BOOKS:

1. Sudhakar, A., and Shyam Mohan S.P., 'Circuits and Network Analysis and Synthesis', Tata McGraw Hill Publishing Company Limited, New Delhi, Fifth Edition, 2017.
2. Mahadevan K., and Chitra C., 'Electrical Circuit Analysis', PHI Learning Pvt. Ltd, Second Edition, 2018.

REFERENCES:

1. Charles K. Alexander, Matthew N.O.Sadiku, 'Fundamentals of Electric Circuits', McGraw Hill, Sixth Edition, 2019.
2. William, H., HaytJr, Jack E., Kemmerly, Steven M., Durbin, Jamie Phillips, 'Engineering Circuit Analysis', McGraw Hill, New Delhi, Tenth Edition, 2023.
3. Chakrabarti, A, 'Circuit Theory Analysis and Synthesis', Dhanpat Rai & Co, New Delhi, Seventh Edition, 2018.
4. Chattopadhyay D., Rakshit P.C., 'Fundamentals of Electric Circuit Theory', S. Chand and Company Limited, Ninth Edition, 2020.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	-	1	-	-	-	1	-	2	3	1
CO2	3	3	2	-	1	-	-	-	1	-	2	3	1
CO3	3	3	2	-	1	-	-	-	1	-	2	3	1
CO4	3	3	2	-	1	-	-	-	1	-	2	3	1
CO5	3	3	2	-	1	-	-	-	1	-	2	3	1

1- Low, 2 - Medium, 3 - High

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24EET22	ELECTRON DEVICES AND CIRCUITS	Category	L	T	P	SL	C
		PCC	45	0	0	45	3

PREREQUISITE:

Understand semiconductor materials, basic circuit components, and fundamental AC/DC circuit principles essential for analog circuit design.

OBJECTIVE:

- To understand the structure, operation, and analysis of semiconductor devices, amplifiers and oscillator circuits.

UNIT - I	DIODES AND ITS APPLICATIONS	(9)

PN junction diode: Structure, operation and V-I characteristics, dynamic resistance, diffusion and transition capacitance – Rectifiers: Half Wave and Full Wave Rectifier – Zener diode characteristics – Zener diode as regulator.

UNIT - II	TRANSISTORS AND THYRISTOR	(9)

BJT: Structure, operation, configurations – JFET, MOSFET, UJT, IGBT: Structure, operation, characteristics – SCR: Structure, operation, characteristics.

UNIT - III	AMPLIFIERS	(9)

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

UNIT - IV	MULTISTAGE AMPLIFIERS AND DIFFERENTIAL AMPLIFIER	(9)

Need for Multistage Amplifiers – Methods of coupling Multistage Amplifiers – BIMOS cascade amplifier – Differential amplifier: Common mode and Difference mode analysis, CMRR – Single tuned amplifiers – Gain and frequency response.

UNIT - V	FEEDBACK AMPLIFIERS AND OSCILLATORS	(9)

Advantages of negative feedback – Feedback amplifiers: voltage/current, series, shunt feedback – positive feedback – Comparison between positive and negative feedback – Conditions for oscillations – Oscillators: RC phase shift, Wien bridge and UJT-based sawtooth oscillator.

LECTURE: 45, SELF LEARNING: 45, TOTAL: 90 PERIODS

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COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Explain the structure and operation of PN junction devices and their applications in rectification and voltage regulation.	Understand
CO2	Summarize the structure, operation and characteristics of BJT, JFET, MOSFET, UJT, IGBT and SCR.	Understand
CO3	Interpret the small signal models and frequency response of BJT and MOSFET amplifier configurations.	Understand
CO4	Illustrate the concepts, configurations, and frequency response of multistage, differential, and tuned amplifiers.	Understand
CO5	Outline the operation of various feedback amplifiers and oscillators.	Understand

TEXTBOOKS:

1. David A Bell, “Fundamentals of Electronic Devices and Circuits”, Oxford University Press India, Fifth Edition, PHI. 2009.
2. Sedha, R.S, “A textbook of Applied Electronics”, S. Chand and Company, New Delhi Ltd., Revised Edition, 2022.

REFERENCES:

1. Albert Malvino and David Bates, “Electronic Principles”, Tata McGraw-Hill, Eighth Edition, 2016.
2. Thomas L. Floyd, “Electronic devices”, Conventional current version, Pearson Prentice Hall, Tenth Edition, 2017.
3. Balbir Kumar, Shail. B. Jain, “Electronic Devices and Circuits,” PHI learning private limited, 2nd Edition, 2014.
4. Robert L. Boylestad, “Electronic Devices and Circuit Theory”, Eleventh Edition, Pearson Prentice Hall, 2013.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	-	-	-	1	1	-	-	1	3
CO2	3	2	-	-	-	-	-	1	1	-	-	1	3
CO3	3	2	-	-	-	-	-	1	1	-	-	1	3
CO4	3	2	-	-	-	-	-	1	1	-	-	1	3
CO5	3	2	-	-	-	-	-	1	1	-	-	1	3

1 - Low, 2 - Medium, 3 - High

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24MAI29	PROBABILITY AND STATISTICS	Category	L	T	P	SL	C
		BSC	45	0	30*	45	4

SEMESTER II - B.E / B.TECH (Common to All Branches)

PREREQUISITE:

A basic understanding of algebra, calculus, and introductory statistics is required to grasp the concepts of probability, hypothesis testing, and statistical methods used in engineering and quality control.

OBJECTIVES:

To build a foundational understanding of probability and random variables, enable the application of two-dimensional random variables in engineering contexts, develop the ability to perform hypothesis testing for both small and large samples, introduce the principles of experimental design in agricultural studies, and provide knowledge of statistical quality control techniques.

UNIT - I	ONE DIMESIONAL RANDOM VARIABLES	(9)

One dimensional Random Variable - Discrete and continuous random Variables -Expectations - Moment generating functions and their properties - Binomial, Poisson, Uniform and Normal distributions.

UNIT - II	TWO - DIMENSIONAL RANDOM VARIABLES	(9)

Joint distributions – Marginal and conditional distributions – Covariance – Karl Pearson's Coefficient of Correlation - Spearman's Rank Correlation - Regression Analysis.

UNIT - III	TESTING OF HYPOTHESIS	(9)

One sample and two sample test for means of large samples (Z- test), One sample and two sample test for means of small samples (t-test), Chi-square - Independent of Attributes - F test for equality of variances.

UNIT - IV	DESIGN OF EXPERIMENTS	(9)

Analysis of variance - One way and two way classifications - Completely Randomized Design - Randomized Block Design - Latin Square Design.

UNIT - V	STATISTICAL QUALITY CONTROL	(9)

Control charts for measurements $\bar{X}$ and R charts – Control charts for C and P charts.

List of Experiments (R Software):

1. Determine the probability by using binomial distribution.
2. Find the probability with the help of normal distribution.
3. Determine the correlation co-efficient between X and Y.
4. Examine the small samples using F distribution.
5. Inspect the data using Latin Square Design (LSD).
6. Find the $\bar{X}$ Charts.
7. Compute the R Charts.

* Alternative weeks : Tutorial and Laboratory

L = 45 , * P = 15 & *T = 15, SL = 45, TOTAL: 120 PERIODS

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COURSE OUTCOMES: At the end of the course, the students will be able to:

COs	Course Outcome	Cognitive Level
CO1	Apply the concepts of one dimensional random variables to compute expectations and analyze the standard distributions.	Apply
CO2	Apply statistical methods to compute marginal and conditional distributions, and perform correlation and regression analysis.	Apply
CO3	Apply Z-test, t-test, Chi-square test, and F-test to analyze sample data and draw inferences on independence of attributes.	Apply
CO4	Apply analysis of variance techniques for one-way and two-way classifications, and implement experimental designs using CRD, RBD and LSD.	Apply
CO5	Construct control charts for measurements Mean and Range charts and attributes charts to assess process control and product quality.	Apply

TEXT BOOKS:

1. S.P. Gupta, "Statistical Methods", Sulthan Chand & Sons, 46th Edition, 2021.

2. Milton. J. S. and Arnold. J.C., "Introduction to Probability and Statistics", Tata McGraw Hill, 4thedition, 2007.

REFERENCES:

1. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2014.

2. Spiegel. M.R., Schiller. J. and Srinivasan, R.A., "Schaum's Outline of Theory and Problems of Probability and Statistics", Tata McGraw Hill Edition, 2004.

3. 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.

4. R.C.Gupta, "Statistical Quality Controls", Khanna Publishers, Delhi, 8th Edition , 2008.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO 5	PO 6	PO7	PO8	P O 9	PO10	PO11	PSO1	PSO2
CO1	3	3	3	3	2	-	-	1	-	-	2	-	-
CO2	3	3	3	3	2	-	-	1	-	-	2	-	-
CO3	3	3	3	3	2	-	-	1	-	-	2	-	-
CO4	3	3	3	3	2	-	-	1	-	-	2	-	-
CO5	3	3	3	3	2	-	-	1	-	-	2	-	-
Avg.	3	3	3	3	2	-	-	1	-	-	2	-	-

1-low, 2-medium, 3-high

LIST OF EQUIPMENTS (For a Batch of 30 Students)

S.No.	Name of the Equipments	Quantity
1.	A computer with Intel (R) Core (TM) i3 – 2130 CPU @ 3.40GHZ processor and 4 GB RAM – DDR3.	30 Nos.
2.	R software (Open source)	30 Nos.

Chairman (BoS)

24CBI26	PYTHON PROGRAMMING	Category	L	T	P	SL	C
		PCC	45	0	30	45	4

(Common to ECE, EEE, Mech, Civil, SFE, BME)

PREREQUISITE:

Basic knowledge of programming concepts such as variables, data types, and control statements. Logical problem-solving ability and basic mathematical understanding are recommended.

OBJECTIVES:

The course helps the students to understand Python basics, write and debug programs, work with functions, files, and data structures, and use exception handling, NumPy, and Pandas for data analysis.

UNIT – I BASICS OF PYTHON PROGRAMMING (15)

Introduction – Python Interpreter – Interactive and Script mode – Values and types – Variables – Operators – Expressions – Statements – Precedence of operators – Multiple assignments – Comments – Input function – Print function – Formatting numbers and strings – Implicit/Explicit type conversion. **(Theory-9)**

List of Exercise:

1. Write a Python program to demonstrate values, types, variables, operators, expressions, multiple assignments, and operator precedence.
2. Develop a Python program to read user input and display formatted output using format () and f- strings.
3. Construct a Python program to perform implicit and explicit type conversion and demonstrate comments. **(Laboratory-6)**

UNIT – II CONTROL STATEMENTS AND STRINGS (15)

Conditional (if), alternative (if-else), chained conditional (if-elif-else). Iteration-while, for, infinite loop, break, continue, pass, else. Strings-String slices, immutability, string methods and operations.**(Theory-9)**

List of Exercise:

1. Construct a Python program using conditional statements (if, if-else, if-elif-else).
2. Develop a Python program demonstrating loop control statements using for, while, break, continue, pass, and infinite loop.
3. Write a Python program to perform string slicing, demonstrate immutability, and apply string methods. **(Laboratory-6)**

UNIT – III FUNCTIONS AND FILES (15)

Functions – Introduction – Inbuilt functions – User-defined functions – Passing parameters: positional, default, keyword arguments – Return values – Local and global scope – Recursion – Lambda functions. Files – Text files – Reading and writing files. **(Theory-9)**

List of Exercise:

1. Write a Python program demonstrating positional, keyword, and default arguments with return values.
2. Construct a Python program using recursion and lambda functions.
3. Develop a Python program to create, write, and read text files. **(Laboratory-6)**

UNIT – IV DATA STRUCTURES: LISTS, TUPLES, SETS, DICTIONARIES (15)

Lists – Creating lists – List operations – List methods – Mutability – List functions – Searching and sorting. Tuples – Tuple assignment – Operations on tuples – Lists and tuples – Tuple as return value. Sets – Creating sets – Set operations. Dictionaries – Operations and methods – Nested dictionaries. **(Theory-9)**

List of Exercise:

1. Write a Python program to create and manipulate lists including searching and sorting.
2. Develop a Python program to demonstrate set and tuple operations.
3. Construct a Python program using dictionaries and nested dictionaries. **(Laboratory-6)**

UNIT – V EXCEPTIONS HANDLING, NUMPY AND PANDAS (15)

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Exceptions – Errors and Exceptions – Handling exception – Built-in and User-defined exceptions. NumPy – Introduction – Computations using NumPy functions – Computation on arrays – Aggregation – Indexing and Sorting. Pandas – Introduction and Basic concepts – DataFrames – Data handling. **(Theory-9)**

List of Exercise:

1. Write a Python program to demonstrate exception handling including built-in and user-defined exceptions.
2. Develop a Python program using NumPy to perform computations, aggregations, indexing, and sorting.
3. Apply Pandas DataFrame operations to create, update, filter, and describe datasets.

(Laboratory-6)

COURSE OUTCOMES:

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

Course Outcome	Description	Bloom's Taxonomy
CO1	Illustrate fundamental Python programming constructs such as variables, operators, expressions, and control statements.	Understand
CO2	Demonstrate Python conditional statements, loops, and string operations for basic program logic.	Apply
CO3	Develop Python programs using functions, recursion, and file handling concepts.	Apply
CO4	Apply Python data structures including lists, sets, tuples, and dictionaries to solve problems.	Apply
CO5	Use to exception handling and perform data manipulation NumPy and Pandas.	Apply

TEXT BOOKS:

1	Eric Matthes, "Python Crash Course: A Hands-On, Project-Based Introduction to Programming", No Starch Press, 3rd Edition, 2025
2	Reema Thareja, "Python Programming Using Problem Solving Approach", Oxford University Press, 3rd Edition, 2025

REFERENCES:

1	Wes McKinney, "Python for Data Analysis: Data Wrangling with pandas, NumPy, and Jupyter", O'Reilly Media, 3rd Edition, 2022
2	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", Green Tea Press, 2nd Edition, 2016
3	Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Interdisciplinary Approach", Pearson Education / Addison-Wesley Professional, 1st Edition, 2016
4	David Beazley & Brian K. Jones, "Python Cookbook: Recipes for Mastering Python 3", O'Reilly Media, 3rd Edition, 2024
5	Luciano Ramalho, "Fluent Python: Clear, Concise, and Effective Programming", O'Reilly Media, 2nd Edition, 2022

Mapping of COs with POs and PSOs

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	–	–	2	–	–	1	1	–	–	3	–
CO2	3	3	2	–	2	–	–	1	1	–	–	3	–
CO3	3	3	2	–	2	–	–	1	1	–	–	3	2
CO4	3	3	2	–	2	–	–	1	1	–	–	3	3
CO5	3	3	2	–	2	–	–	1	1	–	–	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

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24ENP29	PROFESSIONAL COMMUNICATION LABORATORY	Category	L	T	P	SL	C
		HSMC	0	0	30	0	1

(Common to All Branches)

OBJECTIVE:

To enhance learners' proficiency in listening, speaking, reading, and writing through structured activities and professional communication practices relevant to academic and workplace settings.

UNIT - I	VERBAL AND CRITICAL REASONING	(6)

Syllogism – Drawing conclusions from given logical statements, **Assertion and Reason** – Judging the link between a claim and its reason, **Verbal Analogies** – Completing word pairs based on relationships, **Statement and Assumption** – Identifying hidden assumptions in statements, **Statement and Conclusion** – Choosing valid conclusions from given data, **Critical Reasoning** – Evaluating arguments for logic and consistency.

UNIT - II	LISTENING	(6)

Listening to Announcement – Understanding key details and context from public messages, **Short Conversation** – Extracting specific information from brief dialogues, **Motivational Speech** – Grasping main ideas, tone, and speaker's intent, **Telephone Conversation** – Comprehending spoken exchanges over the phone.

UNIT - III	SPEAKING	(6)

Talking about Oneself – Sharing personal details clearly and confidently, **Oral-presentation on a General Topic** – Presenting ideas briefly with clarity and structure, **Group Discussion on Current Affairs** – Expressing and support opinions in group settings, **Role Play** – Performing situational conversations using appropriate language, **Mock & HR Interview** – Answering common interview questions with clarity and confidence.

UNIT - IV	READING	(6)

Reading Short Texts – Understanding the main message and key ideas, **Reading for General and Specific Information** – Locating relevant details in various texts, **Case Studies on Problem Solving** – Analyzing real-life scenarios to identify issues and solutions.

UNIT - V	WRITING	(6)

Written communication: Letters (Apology & Complaint) – Writing formal letters using appropriate tone and structure, **E-mails (Appreciation & Permission)** – Composing clear and courteous emails, **Technical Report** – Using standard format for preparing structured technical report, **Agenda / Minutes** – Preparing format for meeting agendas and recording minutes.

TOTAL (P:30) = 30 PERIODS

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1

List of Experiments:

1. Syllogism, Assertion & Reason and Verbal Analogies
2. Statement & Assumption, Statement & Conclusion and Critical Reasoning
3. Listening: Announcement and Short Conversation
4. Listening: Motivational Speech and Telephone Conversation
5. Speaking: Taking about oneself, Mock & HR Interview and Mini-presentation
6. Speaking: Group Discussion and Role Play
7. Reading: Multiple Choice & Fill in the Blanks
8. Reading: Analyzing Case Studies on Problem Solving
9. Writing: Complaint/Apology Letter and Appreciation/Permission Email
10. Writing: Format of Technical Report and Format of Agenda/Minutes

COURSE OUTCOMES:

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

COs	Description	Ex. No.	Cognitive Level
CO1	Comprehend assumptions and draw conclusions from verbal reasoning tasks.	1 & 2	Understand
CO2	Understand spoken texts to identify key points and the speaker's intent.	3 & 4	Understand
CO3	Use appropriate language and tone in personal, group, and interview conversations.	5 & 6	Understand
CO4	Recognize main ideas and supporting points in short texts and case studies.	7 & 8	Understand
CO5	Draft formal letters, emails, reports, and meeting notes in the correct format.	9 & 10	Understand

TEXT BOOKS:

1. Bhatnagar Nitin, Communicative English for Engineers and Professionals, Pearson India, 2010.
2. Kulbhusan Kumar, RS Salaria, Effective Communication Skill, Khanna Publishing House, 2018.

REFERENCES:

1. Jack C Richards, Interchange, Cambridge University Press, 2022.
2. RS Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning, S Chand, 2024.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	-	-	-	-	-	-	2	3	-	-	-	-
CO2	2	-	-	-	-	-	-	2	3	-	-	-	-
CO3	2	-	-	-	-	-	1	2	3	-	-	-	-
CO4	2	-	-	-	-	-	1	-	3	-	-	-	-
CO5	2	-	-	-	-	-	1	-	3	-	-	-	-

1-Low, 2-Medium, 3-High

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Lab Requirement for a batch of 30 Students

Sl. No.	Description of Equipment / Software	Quantity required
1.	Server	1
	Intel core i3 - 2120	
	4 GB RAM / 240 GB SSD	
	OS: Windows 2011	
	Headphones with mike	
2.	Client Systems	30
	Intel core i3 - 2120	
	4 GB RAM / 240 GB SSD	
	OS: Windows 2011	
	Headphones with mike	
3.	Software	1
	a) Interactive Teacher control software	
	b) English Language Lab Software	
	c) Career Lab Software	

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24EEP21	ELECTRIC CIRCUITS AND ELECTRON DEVICES LABORATORY	Category	L	T	P	SL	C
		PCC	0	0	30	0	1

PREREQUISITE:

Students should have basic knowledge of electrical circuit theory, semiconductors, oscillators, simulation tools, power supplies, and measurement instruments.

OBJECTIVE:

- To perform experiments verifying fundamental circuit theorems, analyse semiconductor device characteristics, and design oscillators in practical electronic circuits.

LIST OF EXPERIMENTS:

1. Verification of Mesh and Nodel analysis.
2. Verification of the Superposition theorem.
3. Verification of Thevenin's theorem.
4. Measurement of power in the three-phase circuit by the two-wattmeter method.
5. Frequency Response of RC and RL Circuit.
6. Verification of V-I Characteristics of PN junction and Zener diode.
7. Real-time verification of Single-phase half and full wave rectifiers with capacitive filters.
8. Characteristics of BJT under common emitter configuration.
9. Real-time verification of V-I Characteristics of FET.
10. Design of UJT relaxation Oscillator.

PRACTICAL: 30, TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level	Exp.
CO1	Apply mesh, node analysis, superposition and Thevenin's theorem to validate circuit principles using simulation tools.	Apply	1, 2, 3
CO2	Analyze RL and RC circuits frequency and transient responses to understand their time and frequency domain behavior.	Analyze	5
CO3	Analyze power measurement in three-phase systems using the two-wattmeter method to determine real, reactive, and apparent power.	Analyze	4
CO4	Analyze V-I characteristics of BJTs, FETs, and PN junction diodes and apply them in rectification to understand semiconductor behavior.	Analyze	6, 7, 8, 9
CO5	Investigate the operation of UJT oscillator circuits and evaluate their suitability for practical applications.	Analyze	10

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Mapping of COs with POs and PSOs													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	-	-	-	1	2	2	-	2	2	3
CO2	3	3	3	2	-	-	1	2	2	-	2	2	3
CO3	3	3	3	2	-	-	1	2	2	-	2	2	2
CO4	3	3	3	2	-	-	1	2	2	-	2	2	3
CO5	3	3	3	2	-	-	1	2	2	-	2	2	3
1 - Low, 2 - Medium, 3 – High													

List of Equipment (For a Batch of 30 Students)

S. No.	Description of Equipment	Qty.
1.	Regulated Power Supply (0-30V)	08 Nos.
2.	Function Generator (MHz Range)	05 Nos.
3.	Oscilloscope (20 MHz)	05 Nos.
4.	Multimeters	05 Nos.
5.	Decade Resistance, Inductance Box, and Capacitance Box	05 Nos. each
6.	Bread Boards	10 Nos.
7.	Resistors of various ranges	20 Nos.
8.	Capacitors of various ranges	25 Nos.
9.	PN Junction Diode – IN4007	20 Nos.
10.	Zener Diode	20 Nos.
11.	Transistor BC107	10 Nos.
12.	Field Effect Transistor (FET) BFW10	05 Nos.
13.	UJT 2N2646	02 Nos.
14.	Transformer (12-0-12)	10 Nos.

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24SDP29	SOFT SKILLS DEVELOPMENT – II	Category	L	T	P	SL	C
		EEC	0	0	30	0	1

(Common to All Branches)

OBJECTIVES:

To introduce students to the basics of aptitude, helping them understand its core concepts and real-world applications. A key focus is placed on developing proficiency in verbal reasoning, which supports improved problem-solving and analytical thinking. Additionally, the course works toward building a strong foundation in English grammar to enhance language accuracy and communication skills.

UNIT - I	PERCENTAGE	(6)

Concept of Percentage – Successive Percentage – Increasing and Decreasing Percentage – Population – Depreciation.

UNIT - II	PROFIT AND LOSS	(6)

Concepts of Cost Price, Selling Price, Profit and Loss – Profit Percentage – Loss Percentage – Problems on Dishonest Seller.

UNIT - III	RATIO PROPORTIONS AND PARTNERSHIP	(6)

Introduction and Ratio Calculation – Mean Proportion – Share Calculation Based on Ratio – Ages – Partnership.

UNIT - IV	LOGICAL REASONING	(6)

Coding and Decoding – Blood Relations – Ranking and Ordering.

UNIT - V	VERBAL ABILITY	(6)

Sentence Improvement – Ordering of Sentence – Cloze Test – Spellings.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Apply percentage concepts to solve problems on growth, depreciation, and population change effectively.	Apply
CO2	Apply concepts of profit, loss, and pricing to analyse transactions, including cases of dishonest selling.	Apply
CO3	Demonstrate proficiency in applying ratio, proportion, and partnership principles	Apply
CO4	Solve the problems on coding-decoding, blood relations, and ranking using logical reasoning techniques	Apply
CO5	Improve the sentence structure, logical sequencing, contextual understanding, and spelling accuracy for effective communication.	Understand

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TEXT BOOKS:

1. R S Aggarwal, "Quantitative Aptitude for Competitive Examinations".
2. Abhijit Guha, "Quantitative Aptitude for Competitive Examinations".
3. Nishit K. Sinha, "Logical Reasoning and Data Interpretation for CAT".
4. R.S. Agarwal, "A Modern Approach to Verbal & Non-Verbal Reasoning".
5. Edgar Thorpe & Showick Thorpe, "English for Competitive Examinations".

REFERENCES:

1. Arun Sharma, Quantitative Aptitude for CAT, 11e, 2025.
2. Arun Sharma, Logical Reasoning for CAT, 7e, 2025.
3. Wren & Martin, High School English Grammar & Composition.
4. https://prepinsta.com/.
5. https://www.geeksforgeeks.org/quantitative-aptitude/?ref=shm.
6. https://www.youtube.com/@FeelFreetoLearn/playlists.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	-	2	-	-	2	-	-	3	-	-
CO2	3	3	2	-	2	-	-	2	-	-	3	-	-
CO3	3	2	2	-	2	-	-	2	-	-	3	-	-
CO4	3	3	2	-	2	-	-	2	-	-	3	-	-
CO5	3	2	-	-	2	-	-	3	3	-	3	-	-
Avg.	3	3	2	-	2	-	-	2	3	-	3	-	-

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