KSR College of Engineering

AN AUTONOMOUS INSTITUTION

25 Years KSRCE 2001 – 2026 Celebrating Academic Excellence

NAAC ACCREDITED A++ | NBA ACCREDITED PROGRAMMES | IDEA Lab

B.E. - COMPUTER SCIENCE AND ENGINEERING (CYBER SECURITY)

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 COMPUTER SCIENCE AND ENGINEERING (CYBERSECURITY)

B.E. – Computer Science and Engineering (Cybersecurity)

(REGULATIONS 2024)

Vision of the Institution

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

Mission of the Institution

IM 1	Accomplish value-based quality education through innovative teaching-learning process.
IM 2	Enrich Engineering and Managerial Skills through cutting-edge laboratories to meet the demands of global integration.
IM 3	Enhance innovation and research to meet the evolving needs of industry, society, and sustainable development.

Vision of the Department / Programme: Computer Science and Engineering (Cybersecurity)

DV	To produce ethical cybersecurity technocrat for supporting digital ecosystems and sustainable global development.

Mission of the Department / Programme: Computer Science and Engineering (Cybersecurity)

DM 1	Deliver quality education in cybersecurity through Immersive learning.
DM 2	Impart interdisciplinary skills to meet global cybersecurity challenges through State of art Laboratory.
DM 3	Foster research, innovation, and ethical practices to promote sustainable digital security.

Programme Educational Objectives (PEOs): Computer Science and Engineering (Cybersecurity)

The graduates of the programme will be able to	
PEO 1	**Core Competency:** Analyze and manage security incidents through effective threat detection and response strategies.
PEO 2	**Professionalism:** Exhibit interdisciplinary skills to address cybersecurity challenges with ethical integrity that contribute to global cyber resilience.
PEO 3	**Career Development:** Engage in lifelong learning, research and entrepreneurship to foster innovation and lead advancements in cyber security

Chairman (BoS)

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)

PROGRAMME SPECIFIC OUTCOMES (PSO's)

PSO1	**Secure System Design:** Design and implement secure systems to protect data and infrastructure from cyber threats.
PSO2	**Threat Detection and Response:** Detect and respond to cyber threats using modern tools and ensure compliance with relevant standards.

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

SEMESTER I

S. No.	Course Code	Course Title	Category	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
Induction Programme			-	-	-	-	-	-	-	-	-	-
THEORY COURSES												
1.	24ENT19	Professional Communication	HSMC	45	0	0	45	90	3	40	60	100
2.	24EET06	Basics of Electrical and Electronics Engineering	ESC	45	0	0	45	90	3	40	60	100
3.	24GET19	தமிழ் மரபு / Heritage of Tamils	HSMC	15	0	0	15	30	1	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
4.	24ITI16	Programming for Problem Solving	ESC	15	0	90	15	120	4	50	50	100
5.	24MAI19	Matrices and Calculus	BSC	45	0	30	45	120	4	50	50	100
6.	24CHI06	Chemistry for Engineers	BSC	45	0	30	45	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 COURSE												
9.	24SDP19	Soft Skills Development-I	EEC	0	0	30	0	30	1	60	40	100
			TOTAL	225	0	240	225	690	23	900		

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SEMESTER II													
S. No.	Course Code	Course Title	Category	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
THEORY COURSES												
1	24CST21	Design Thinking	PCC	30	0	0	30	60	**2**	40	60	100
2	24GET29	தமிழரும் தொழில் நுட்பமும்/ Tamils and Technology	HSMC	15	0	0	15	30	**1**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
3	24CSI26	JAVA Programming	PCC	15	0	90	15	120	**4**	50	50	100
4	24MAI29	Probability and Statistics	BSC	45	0	30	45	120	**4**	50	50	100
5	24PHI07	Engineering Physics	BSC	45	0	30	45	120	**4**	50	50	100
6	24ECI26	Digital Principles and System Design	ESC	45	0	30	45	120	**4**	50	50	100
LABORATORY COURSES												
7	24ENP29	Professional Communication Laboratory-I	HSMC	0	0	30	0	30	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
8	24SDP29	Soft Skills Development-II	EEC	0	0	30	0	30	**1**	60	40	100
MANDATORY COURSE												
9		Mandatory Course - I	MC	0	0	30	0	30	**0**	100	-	100
			TOTAL	**195**	**0**	**270**	**195**	**660**	**21**	**900**		

SEMESTER III													
S. No.	Course Code	Course Title	Category	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
THEORY COURSES												
1	24MAT37	Discrete Mathematical Structures	BSC	45	15	0	60	120	**4**	40	60	100
2	24ADT36	Computer Organization and Architecture	PCC	45	0	0	45	90	**3**	40	60	100
3	24IOT36	Data Structures	PCC	45	0	0	45	90	**3**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
4	24IOI36	Operating Systems	PCC	45	0	30	45	120	**4**	50	50	100
5	24CBI36	Advanced JAVA Programming	PCC	15	0	90	15	120	**4**	50	50	100
LABORATORY COURSES												
6	24IOP36	Data Structures Laboratory	PCC	0	0	60	0	60	**2**	40	60	100
7	24CBP36	Design Studio – I	PCC	0	0	30	0	30	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
8	24SDP39	Soft Skills Development-III	EEC	0	0	30	0	30	**1**	60	40	100
			TOTAL	**195**	**15**	**240**	**210**	**660**	**22**	**800**		

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SEMESTER IV													
S. No.	Course Code	Course Title	Category	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
THEORY COURSES												
1	24MAT46	Numerical and Computational Techniques	BSC	45	15	0	60	120	4	40	60	100
2	24ITT46	Database Management Systems	PCC	45	0	0	45	90	3	40	60	100
3	24CST46	Design and Analysis of Algorithm	PCC	45	0	0	45	90	3	40	60	100
4	24CBT41	Cryptography	PCC	45	0	0	45	90	3	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
5	24ADI46	Python with Data Science	PCC	45	0	30	45	120	4	50	50	100
LABORATORY COURSES												
6	24CSP46	Design and Analysis of Algorithm Laboratory	PCC	0	0	60	0	60	2	60	40	100
7	24ITP46	Database Management Systems Laboratory	PCC	0	0	60	0	60	2	40	60	100
8	24CSP47	Design Studio-II	PCC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
9	24SDP49	Soft Skills Development-IV	EEC	0	0	30	0	30	1	60	40	100
			TOTAL	225	15	210	240	690	23	900		
*- The students should undergo two weeks internship during the IV semester summer vacation.												

SEMESTER V												
S. No.	Course Code	Course Title	Category	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
THEORY COURSES												
1	24ITT56	Computer Networks	PCC	45	0	0	45	90	3	40	60	100
2	24CBT51	Ethical Hacking	PCC	45	0	0	45	90	3	50	50	100
3	24CBT56	Automata and Compiler Design	PCC	45	30	0	45	120	4	40	60	100
4	24ECT56	Microprocessors and Microcontrollers	PCC	45	0	0	45	90	3	40	60	100
5		Professional Elective – I	PEC	45	0	0	45	90	3	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
6	24CBI51	Artificial Intelligence	PCC	45	0	30	45	120	4	50	50	100
LABORATORY COURSES												
7	24ITP56	Computer Networks Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
8	24CBP51	Ethical Hacking Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
9	24ECP56	Microprocessors and Microcontrollers Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
10	24CBP52	Internship	EEC	0	0	0	30	30	1	100	-	100
11	24CBP53	Industry oriented course-I	EEC	0	0	0	0	0	1	100	-	100
12	24CBP54	Seminar Presentation	EEC	0	0	30	0	30	1	100	-	100
MANDATORY COURSE												
13		Mandatory Course - II	MC	30	0	0	0	30	0	100	-	100
			TOTAL	300	30	195	300	825	27.5	1300		
*- The students should undergo two weeks internship during the IV semester summer vacation.												

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SEMESTER VI													
S. No.	Course Code	Course Title	Category	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
THEORY COURSES												
1	24CBT61	Penetration Testing and Vulnerability Assessment	PCC	45	0	0	45	120	3	40	60	100
2	24GET69	Entrepreneurship Development	HSMC	45	0	0	45	90	3	40	60	100
3	24GET09	Universal Human Values and Ethics	HSMC	45	0	0	45	90	3	40	60	100
4		Professional Elective – II	PEC	45	0	0	45	90	3	40	60	100
5		Professional Elective – III	PEC	45	0	0	45	90	3	40	60	100
LABORATORY COURSE												
6	24CBP61	Penetration Testing and Vulnerability Assessment Laboratory	PCC	0	0	45	0	45	1.5	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
7	24CBP62	Industry oriented course-II	EEC	0	0	0	0	0	1	100	-	100
8	24CBP63	Technical Comprehension	EEC	0	0	30	0	30	1	100	-	100
9	24CBP64	Mini Project	EEC	0	0	60	0	60	2	60	40	100
MANDATORY COURSE												
10		Mandatory Course - III	MC	30	0	0	0	30	0	100	-	100
			TOTAL	255	0	135	225	645	20.5	1000		

SEMESTER VII												
S. No.	Course Code	Course Title	Category	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
THEORY COURSES												
1	24CBT71	Malware Analysis	PCC	45	0	0	45	90	3	40	60	100
2	24CST76	Standards in Computer Science and 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
6		Open Elective –I	OEC	45	0	0	45	90	3	40	60	100
EMPLOYABILITY ENHANCEMENT COURSE												
7	24CBP71	Project work Phase - I	EEC	0	0	60	0	60	2	60	40	100
			TOTAL	240	0	60	240	540	18	700		

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SEMESTER VIII													
S. No.	Course Code	Course Title	Category	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
EMPLOYABILITY ENHANCEMENT COURSE												
1	24CBP81	Project Work Phase – II	EEC	0	0	240	0	240	8	60	40	100
			TOTAL	0	0	240	0	240	8	100		
									TOTAL CREDITS	163		

TOTAL NUMBER OF CREDITS TO BE EARNED FOR AWARD OF THE DEGREE=163

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

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Department	Computer Science and Engineering (Cybersecurity)	
Programme	B.E.	

HUMANITIES, SOCIAL SCIENCE AND MANAGEMENT COURSES (HSMC)

S. No.	Course Code	Course Title	Semester	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
1	24ENT19	Professional Communication	I	45	0	0	45	90	3	40	60	100
2	24GET19	தமிழ் மரபு/ Heritage of Tamils	I	15	0	0	15	30	1	40	60	100
3	24GET29	தமிழரும் தொழில் நுட்பமும்/ Tamils and Technology	II	15	0	0	15	30	1	40	60	100
4	24ENP29	Professional Communication Laboratory	II	0	0	30	0	30	1	60	40	100
5	24GET69	Entrepreneurship Development	VI	45	0	0	45	90	3	40	60	100
6	24GET09	Universal Human Values and Ethics	VI	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	Semester	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
1	24MAI19	Matrices and Calculus	I	45	0	30	45	120	4	50	50	100
2	24CHI06	Chemistry for Engineers	I	45	0	30	45	120	4	50	50	100
3	24MAI29	Probability and Statistics	II	45	0	30	45	120	4	50	50	100
4	24PHI07	Engineering Physics	II	45	0	30	45	120	4	50	50	100
5	24MAT37	Discrete Mathematical Structures	III	45	15	0	60	120	4	40	60	100
6	24MAT46	Numerical and Computational Techniques	IV	45	15	0	60	120	4	40	60	100
			TOTAL	270	30	120	300	720	24			

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ENGINEERING SCIENCE COURSES(ESC)													
S. No.	Course Code	Course Title	Semester	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
1.	24EET06	Basics of Electrical and Electronics Engineering	I	45	0	0	45	90	3	40	60	100
2.	24ITI16	Programming for Problem Solving	I	15	0	90	15	120	4	50	50	100
3.	24MEP16	Engineering Graphics Laboratory	I	15	0	30	15	60	2	60	40	100
4.	24GEP16	Engineering Experience Laboratory	I	0	0	30	0	30	1	60	40	100
5.	24ECI26	Digital Principles and System Design	II	45	0	30	45	120	4	50	50	100
			TOTAL	120	0	180	120	420	14			

EMPLOYABILITY ENHANCEMENT COURSES (EEC)												
S. No.	Course Code	Course Title	Semester	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
1	24SDP19	Soft Skills Development-I	I	0	0	30	0	30	1	60	40	100
2	24SDP29	Soft Skills Development-II	II	0	0	30	0	30	1	60	40	100
3	24SDP39	Soft Skills Development-III	III	0	0	30	0	30	1	60	40	100
4	24SDP49	Soft Skills Development-IV	IV	0	0	30	0	30	1	60	40	100
5	24CBP52	Internship	V	0	0	0	30	30	1	100	-	100
6	24CBP53	Industry oriented course-I	V	0	0	0	0	0	1	100	-	100
7	24CBP54	Seminar Presentation	V	0	0	30	0	30	1	100	-	100
8	24CBP62	Industry oriented course-II	VI	0	0	0	0	0	1	100	-	100
9	24CBP63	Technical Comprehension	VI	0	0	30	0	30	1	100	-	100
10	24CBP64	Mini Project	VI	0	0	60	0	60	2	60	40	100
11	24CBP71	Project work Phase - I	VII	0	0	60	0	60	2	60	40	100
12	24CBP81	Project Work Phase – II	VIII	0	0	240	0	240	8	60	40	100
			TOTAL	0	0	540	30	570	21			

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PROFESSIONAL CORE COURSES (PCC)												
S. No.	Course Code	Course Title	Semester	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
1	24CST21	Design Thinking	II	30	0	0	30	60	2	40	60	100
2	24CSI29	JAVA Programming	II	15	0	90	15	120	4	50	50	100
3	24ADT36	Computer Organization and Architecture	III	45	0	0	45	90	3	40	60	100
4	24IOT36	Data Structures	III	45	0	0	45	90	3	40	60	100
5	24IOI36	Operating Systems	III	15	0	90	15	120	4	50	50	100
6	24CBI36	Advanced JAVA Programming	III	45	0	30	45	120	4	50	50	100
7	24IOP36	Data Structures Laboratory	III	0	0	60	0	60	2	40	60	100
8	24CBP36	Design Studio – I	III	0	0	30	0	30	1	60	40	100
9	24ITT46	Database Management Systems	IV	45	0	0	45	90	3	40	60	100
10	24CST46	Design and Analysis of Algorithm	IV	45	0	0	45	90	3	40	60	100
11	24CBT41	Cryptography	IV	45	0	0	45	90	3	40	60	100
12	24ADI46	Python with Data Science	IV	45	0	30	45	120	4	50	50	100
13	24CSP46	Design and Analysis of Algorithm Laboratory	IV	0	0	60	0	60	2	60	40	100
14	24ITP46	Database Management Systems Laboratory	IV	0	0	60	0	60	2	40	60	100
15	24CSP47	Design Studio-II	IV	0	0	30	0	30	1	60	40	100
16	24ITT56	Computer Networks	V	45	0	0	45	90	3	40	60	100
17	24CBT51	Ethical Hacking	V	45	0	0	45	90	3	40	60	100
18	24CBT56	Automata and Compiler Design	V	45	30	0	45	120	4	40	60	100
19	24ECT56	Microprocessors and Microcontrollers	V	45	0	0	45	90	3	40	60	100
20	24CBI51	Artificial Intelligence	V	45	0	30	45	120	4	50	50	100
21	24ITP56	Computer Networks Laboratory	V	0	0	45	0	45	1.5	60	40	100
22	24CBP51	Ethical Hacking Laboratory	V	0	0	45	0	45	1.5	60	40	100
23	24ECP56	Microprocessors and Microcontrollers Laboratory	V	0	0	45	0	45	1.5	60	40	100
24	24CBT61	Penetration Testing and Vulnerability Assessment	VI	45	0	0	45	120	3	40	60	100
25	24CBP61	Penetration Testing and Vulnerability Assessment Laboratory	VI	0	0	45	0	45	1.5	60	40	100
26	24CBT71	Malware Analysis	VII	45	0	0	45	90	3	40	60	100
27	24CST76	Standards in Computer Science and Engineering	VII	15	0	0	15	30	1	100	-	100
			TOTAL	705	30	690	705	2160	71			

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K.S.R. College of Engineering (Autonomous) Centre for Academic Courses Tiruchengode-637215.

VERTICAL 1	VERTICAL 2	VERTICAL 3	VERTICAL 4	VERTICAL 5	VERTICAL 6
Cloud Security Engineer	**SOC Analyst**	**GRC Analyst**	**Incident Response Analyst**	**Application Security Engineer**	**Full Stack Developer**
Cloud Security	Cybersecurity & Threat Landscape	Information Security Governance	Incident Response & Cyber Crisis Management	Secure Software Engineering	Frontend Development
Identity & Access Management	Security Operations & SIEM	Risk Assessment & Management	Threat Hunting	Application Security Testing	Backend Development
Container & Kubernetes Security	Network Security & Monitoring	Security Policies & Compliance Frameworks	Reverse Engineering	Secure SDLC & Threat Modeling	API Design & Integration
DevSecOps & CI/CD Security	Incident Detection & Response	Security Auditing & Assurance	SOC Automation	Secure API and Microservices Security	Software Testing & Debugging
Automation & Security Orchestration	Thread Intelligence & Threat Hunting	Cyber law & Data Privacy	Root Cause Analysis & Incident Reporting	Software Vulnerability Management	Deployment & DevOps
Cloud Compliance & Risk Management	Security Frameworks & Compliance	Compliance Standards & Regulations	Business Continuity & Disaster Recovery	Secure Coding Practices	Web Application Security

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

S. No.	Course Code	Course Title	Category	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
VERTICAL 1: CLOUD SECURITY ENGINEER												
1.	24CBE01	Cloud Security	PEC	45	0	0	45	90	3	40	60	100
2.	24CBE02	Identity & Access Management	PEC	45	0	0	45	90	3	40	60	100
3.	24CBE03	Container & Kubernetes Security	PEC	45	0	0	45	90	3	40	60	100
4.	24CBE04	DevSecOps & CI/CD Security	PEC	45	0	0	45	90	3	40	60	100
5.	24CBE05	Automation & Security Orchestration	PEC	45	0	0	45	90	3	40	60	100
6.	24CBE06	Cloud Compliance & Risk Management	PEC	45	0	0	45	90	3	40	60	100
VERTICAL 2: SOC ANALYST												
1.	24CBE07	Cybersecurity & Threat Landscape	PEC	45	0	0	45	90	3	40	60	100
2.	24CBE08	Security Operations & SIEM	PEC	45	0	0	45	90	3	40	60	100
3.	24CBE09	Network Security & Monitoring	PEC	45	0	0	45	90	3	40	60	100
4.	24CBE10	Incident Detection & Response	PEC	45	0	0	45	90	3	40	60	100
5.	24CBE11	Thread Intelligence & Threat Hunting	PEC	45	0	0	45	90	3	40	60	100
6.	24CBE12	Security Frameworks & Compliance	PEC	45	0	0	45	90	3	40	60	100
VERTICAL 3: GRC ANALYST												
1.	24CBE13	Information Security Governance	PEC	45	0	0	45	90	3	40	60	100
2.	24CBE14	Risk Assessment & Management	PEC	45	0	0	45	90	3	40	60	100
3.	24CBE15	Security Policies & Compliance Frameworks	PEC	45	0	0	45	90	3	40	60	100
4.	24CBE16	Security Auditing & Assurance	PEC	45	0	0	45	90	3	40	60	100
5.	24CBE17	Cyber law & Data Privacy	PEC	45	0	0	45	90	3	40	60	100
6.	24CBE18	Compliance Standards & Regulations	PEC	45	0	0	45	90	3	40	60	100

Chairman (BoS)

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

S. No.	Course Code	Course Title	Category	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
VERTICAL4: INCIDENT RESPONSE ANALYST												
1.	24CBE19	Incident Response & Cyber Crisis Management	PEC	45	0	0	45	90	3	40	60	100
2.	24CBE20	Threat Hunting	PEC	45	0	0	45	90	3	40	60	100
3.	24CBE21	Reverse Engineering	PEC	45	0	0	45	90	3	40	60	100
4.	24CBE22	SOC Automation	PEC	45	0	0	45	90	3	40	60	100
5.	24CBE23	Root Cause Analysis & Incident Reporting	PEC	45	0	0	45	90	3	40	60	100
6.	24CBE24	Business Continuity & Disaster Recovery	PEC	45	0	0	45	90	3	40	60	100
VERTICAL 5: APPLICATION SECURITY ENGINEER												
1.	24CBE25	Secure Software Engineering	PEC	45	0	0	45	90	3	40	60	100
2.	24CBE26	Application Security Testing	PEC	45	0	0	45	90	3	40	60	100
3.	24CBE27	Secure SDLC & Threat Modeling	PEC	45	0	0	45	90	3	40	60	100
4.	24CBE28	Secure API and Microservices Security	PEC	45	0	0	45	90	3	40	60	100
5.	24CBE29	Software Vulnerability Management	PEC	45	0	0	45	90	3	40	60	100
6.	24CBE30	Secure Coding Practices	PEC	45	0	0	45	90	3	40	60	100
VERTICAL 6: FULL STACK DEVELOPER												
1.	24CBE31	Frontend Development	PEC	45	0	0	45	90	3	40	60	100
2.	24CBE32	Backend Development	PEC	45	0	0	45	90	3	40	60	100
3.	24CBE33	API Design & Integration	PEC	45	0	0	45	90	3	40	60	100
4.	24CBE34	Software Testing & Debugging	PEC	45	0	0	45	90	3	40	60	100
5.	24CBE35	Deployment & DevOps	PEC	45	0	0	45	90	3	40	60	100
6.	24CBE36	Web Application Security	PEC	45	0	0	45	90	3	40	60	100

Chairman (BoS)

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

S. No.	Course Code	Course Title	Category	Periods per Sem					Credit	Max. Marks		
				L	T	P	SL	Tot	C=T/30	CA	ES	Tot
MANDATORY COURSE – I& II												
1	24MCP09	Yoga for Stress Management	MC	0	0	30	0	30	0	-	-	-
2	24MCT01	Constitution of India	MC	15	0	0	15	30	0	100	-	100
3	24MCT02	Environmental Science and sustainability	MC	15	0	0	15	30	0	100	-	100
4	24MCT03	Introduction to Gender Studies	MC	15	0	0	15	30	0	100	-	100
5	24MCT04	Life Science for Engineers	MC	15	0	0	15	30	0	100	-	100
6	24MCT05	Industrial safety	MC	15	0	0	15	30	0	100	-	100
7	24MCT06	Essence of Indian Traditional Knowledge	MC	15	0	0	15	30	0	100	-	100
8	24MCT07	Elements of Literature	MC	15	0	0	15	30	0	100	-	100
9	24MCT08	Disaster Management	MC	15	0	0	15	30	0	100	-	100

S. No.	Course Code	Course Title	Category	Periods / Semester					C= T/30	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
OPEN ELECTIVE DETAILS												
AUTOMOBILE ENGINEERING												
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
BIO-MEDICAL ENGINEERING												
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
CIVIL ENGINEERING												
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
COMPUTER SCIENCE AND ENGINEERING												
7	24CSO01	Data structures and Algorithms using C	OEC	45	0	30	45	120	4	40	60	100
8	24CSO02	Fundamentals of Java Programming	OEC	15	0	90	15	120	4	40	60	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
COMPUTER SCIENCE AND ENGINEERING (IoT)												
11	24IOO01	Industrial Internet of Things	OEC	45	0	0	45	90	3	40	60	100

Chairman (BoS)

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

12	24IOO02	Introduction to Sensors and IoT	OEC	45	0	0	45	90	**3**	40	60	100
COMPUTER SCIENCE AND ENGINEERING (Cyber Security)												
13	24CBO01	Ethical Hacking	OEC	45	0	0	45	90	**3**	40	60	100
14	24CBO02	Digital and Mobile Forensics	OEC	45	0	0	45	90	**3**	40	60	100
15	24CBO03	Applied Java Programming	OEC	15	0	90	15	120	**4**	50	50	100
ARTIFICIAL INTELLIGENCE AND DATA SCIENCE												
16	24CSO06	Data Science Fundamentals	OEC	45	0	0	45	90	**3**	40	60	100
17	24CSO07	Artificial Intelligence and Machine learning	OEC	45	0	0	45	90	**3**	40	60	100
18	24CSO08	Data Exploration and Visualization	OEC	45	0	0	45	90	**3**	40	60	100
ELECTRONICS AND COMMUNICATION ENGINEERING												
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
ELECTRICAL AND ELECTRONICS ENGINEERING												
23	24EEO01	Solar and Wind Energy System	OEC	45	0	0	45	90	**3**	40	60	100
24	24EEO02	Hydrogen and Hybrid Energy System	OEC	45	0	0	45	90	**3**	40	60	100
25	24EEO03	Electric Vehicle Technology	OEC	45	0	0	45	90	**3**	40	60	100
26	24EEO04	Energy Conservation and Management	OEC	45	0	0	45	90	**3**	40	60	100
INFORMATION TECHNOLOGY												
27	24ITO01	Introduction to Mobile Application Development	OEC	45	0	0	45	90	**3**	40	60	100
28	24ITO02	Introduction to Big Data and Analytics	OEC	45	0	0	45	90	**3**	40	60	100
29	24ITO03	Augmented Reality / Virtual Reality	OEC	45	0	0	45	90	**3**	40	60	100
MECHANICAL ENGINEERING												
30	24MEO01	3D Printing	OEC	45	0	0	45	90	**3**	40	60	100
31	24MEO02	Robotics and Automation	OEC	45	0	0	45	90	**3**	40	60	100
32	24MEO03	Lean Manufacturing	OEC	45	0	0	45	90	**3**	40	60	100
SAFETY AND FIRE ENGINEERING												
33	24SFO01	Occupational Health and Safety	OEC	45	0	0	45	90	**3**	40	60	100
34	24SFO02	Electrical Safety	OEC	45	0	0	45	90	**3**	40	60	100
35	24SFO03	Building Fire Safety	OEC	45	0	0	45	90	**3**	40	60	100
36	24SFO04	Construction Safety	OEC	45	0	0	45	90	**3**	40	60	100

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Summary										
Name of the Programme: B.E Computer Science and Engineering (Cyber security)										
CATEGORY	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**TOTAL CREDITS**	**%**
HSMC	**4**	**2**	**-**	**-**	**-**	**6**	**-**	**-**	**12**	**7.36**
BSC	8	8	4	4	-	-	-	-	**24**	**14.72**
ESC	10	4	-	-	-	-	-	-	**14**	**8.59**
PCC	-	6	17	18	21.5	4.5	4	-	**71**	**43.56**
PEC	-	-	-	-	3	6	9	-	**18**	**11.04**
OEC	-	-	-	-	-	-	3	-	**3**	**1.84**
EEC	1	1	1	1	3	4	2	8	**21**	**12.88**
MC	-	✓	-	-	✓	✓	-	-	**-**	**-**
Total	**23**	**21**	**22**	**23**	**27.5**	**20.5**	**18**	**8**	**163**	**100.0**

Total No.Of Credits=163
Total No.Of.Credit for Lateral Entry Students=119

Chairman (BoS)

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

Chairman (BoS)

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

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

24EET06	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING	Category	L	T	P	SL	C
		ESC	45	0	0	45	3

(Common to AE, BME, CSE, CSE (CS), CSD, CSE (IoT), IT, MECH, SFE)

PREREQUISITE:

Basic knowledge of calculus, differential equations, and physics (especially electromagnetism) with strong problem-solving skills for circuit analysis.

OBJECTIVE:

- To introduce the fundamentals of electrical and electronic systems, enabling analysis and *application of basic circuits, machines and digital components.*

UNIT - I	DC AND AC CIRCUITS	(9)

DC circuits: Electrical quantities – Ohm's law – Kirchhoff's current and voltage laws – Series and parallel resistors – Simple problems.

AC circuits: Waveforms, average value, RMS value, form factor, peak factor, power and power factor – Pure R, L and C – Series RL and RC circuits.

UNIT - II	ELECTRICAL MACHINES	(9)

DC machine: construction, working principle and applications – Single phase induction motor: Capacitor start capacitor run induction motor – Three phase induction motor: construction and working principle – Single phase transformer: construction and working principle.

UNIT - III	ELECTRICAL INSTALLATIONS	(9)

Classification of wiring system – Earthing – Types: pipe earthing, plate earthing, strip earthing – On-line and Off-line UPS – Lamps: Fluorescent tube, LED.

UNIT - IV	ANALOG ELECTRONICS	(9)

PN junction diode and Zener diode: Principle of operation and V-I characteristics – Half and full wave rectifier – Bipolar Junction Transistor: Construction and working.

UNIT - V	DIGITAL ELECTRONICS	(9)

Digital logic gates: NOT, AND, OR, NAND, NOR, EXOR – Digital circuits: half-adder, full-adder, JK and D flip flop – Introduction to Arduino components and IDE.

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

Chairman (BoS)

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

COURSE OUTCOMES:

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

COs	Course Outcome	Bloom's Taxonomy Level
CO1	Interpret the fundamental concepts of electrical circuits to solve the DC and AC circuit problems.	Understand
CO2	Elaborate the construction and working principles of DC machines, induction motors and transformers.	Understand
CO3	Describe the wiring systems, earthing techniques and the functionality of UPS and lighting systems.	Understand
CO4	Identify the operation and characteristics of PN junction, Zener diode and BJT.	Understand
CO5	Illustrate the functionality of digital logic gates, adders, flip-flops and Arduino components.	Understand

TEXT BOOKS:

1 Kothari D.P and Nagrath I.J, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill, Uttar Pradesh, 2020.

2 Bhattacharya S.K, "Basic Electrical and Electronics Engineering", Pearson Education, Delhi, Second Edition, 2017.

REFERENCES:

1 Jain V.K, Amitabh Bajaj, "Design of Electrical Installation", University Science Press, New Delhi, 2016.

2 Ramamoorty M, Chandra Sekhar O, "Electrical Machines", PHI Learning Pvt. Ltd, Delhi, 2018.

3 Christopher Siu, "Electronic Devices, Circuits, and Applications", Springer International Publishing, 2022.

4 Kothari D.P, Dhillon J.S, "Digital Circuits & Design", First Edition, Pearson, Delhi, 2015.

Mapping of COs with POs and PSOs

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

Chairman (BoS)

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

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 – குமரிமுனியில் 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)

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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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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)

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

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 a 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, preprocessor 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)

UNIT - III	FUNCTIONS AND POINTERS	(21)

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Function - Library functions and user-defined functions - Function prototypes and function definitions - Call by value - Call by reference - Recursion - Pointers - 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)

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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 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, New Delhi, 2011.
2. Yashavant P. Kanetkar. "Let Us C", BPB Publications, 14th edition, 2016.

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, Pearson Education, India, Third Edition ,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	-	-	-	-	2	-	2	2	3	2
CO2	3	3	2	-	1	1	-	2	-	2	2	2	2
CO3	3	3	3	2	-	1	-	2	-	2	2	3	2
CO4	3	3	2	-	-	1	-	2	-	2	1	3	2
CO5	3	3	3	3	2	2	-	2	-	2	2	3	2

1 - Low, 2 - Medium, 3 – High

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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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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)

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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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.

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

24CST21	DESIGN THINKING	Category	L	T	P	SL	C
		PCC	30	0	0	30	2

(COMMON TO CSE, CSE(CS), CSE(IOT), CSD and IT)

PRE-REQUISITE

Students are expected to have an empathetic mindset to help them understand users, a curious mindset to explore and questions assumptions, a collaborative mindset for interdisciplinary teamwork, an iterative approach for refining ideas and creativity to generate innovative solutions

OBJECTIVES

To equip students with knowledge and skills in Design Thinking by introducing its fundamental principles and guiding them through the stages of Feel, Define, Divergence and Convergence and Communication using practical tools and case studies to encourage creative problem solving and user centered innovation

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.

L=30, T=0, P=0, TOTAL: 30 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	Summarize the key principles of design thinking and their relevance to real-world problem contexts.	Understand
CO2	Interpret the significance of a design mindset in fostering creativity and innovation.	Understand
CO3	Apply design thinking methods effectively at each stage of the problem-solving process.	Apply
CO4	Implement the phases of design thinking to address complex challenges systematically.	Apply
CO5	Execute design thinking techniques and tools to create, test, and refine potential solutions.	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 /	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	-	-	1	1	1	-	1	2	1
CO2	2	2	-	-	-	-	1	1	1	-	1	2	1
CO3	3	3	2	-	-	-	1	1	1	-	1	3	2
CO4	3	3	2	-	-	-	1	1	1	-	1	3	3
CO5	3	3	3	-	-	-	1	1	1	-	1	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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24CSI26	JAVA PROGRAMMING	Category	L	T	P	SL	C
		PCC	15	0	90	15	4

(Common to CSE,IT,IoT,CSE(CS) and AIDS)

PREREQUISITE:

Basic knowledge of programming concepts such as variables, data types, loops and conditional statements.

OBJECTIVES:

To introduce Object-Oriented Programming concepts using Java and develop skills in inheritance, interfaces, exception handling, file handling, multithreading and collections for building reliable applications.

UNIT – I **JAVA LANGUAGE BASICS** **(3+18)**

Classes in Java – Constructors and Methods – Representing Real-World Entities Using Classes – Access Specifiers – Static Members – Comments – Data Types – Variables – Operators – Control Flow – Arrays – Packages – Java API Documentation – Javadoc Comments.

List of Experiments:

1. Apply object-oriented principles by writing a Java program that defines a simple class representing a real-world entity, uses both default and parameterized constructors to initialize objects, and illustrates the use of public, private, and protected access specifiers.
2. Implement a Java program that demonstrates the use of static data members and static methods to show shared values across objects and includes appropriate single-line, multi-line, and documentation comments.
3. Analyze a Java program that uses different data types and variables to perform simple calculations and evaluates expressions using arithmetic, relational, and logical operators.
4. Develop a Java program that demonstrates control flow statements such as if-else, switch, for loop, while loop, and do-while loop.
5. Write a Java program that performs array operations including creation, traversal, and basic processing, and organizes the program using packages with proper Javadoc comments to generate documentation

UNIT – II **BASICS OF OBJECT ORIENTED PROGRAMMING** **(3+18)**

Object-Oriented Programming – Abstraction – Objects and Classes – Encapsulation – Inheritance – Polymorphism – OOP in Java – Characteristics of Java – Java Environment – Java Source File Structure – Compilation – Fundamental Programming Structures in Java.

List of Experiments:

1. Construct a Java class representing a real-world entity with attributes and methods, apply encapsulation using private data members with public accessors, and initialize objects using multiple constructors
2. Analyze abstraction in Java by implementing an abstract class with abstract methods and creating appropriate subclasses to perform specific operations.

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3. Develop inheritance in Java by designing class hierarchies that demonstrate single inheritance, multilevel inheritance, and hierarchical inheritance with suitable parent and child classes.
4. Implement polymorphism in Java by demonstrating both compile-time polymorphism using method overloading and runtime polymorphism using method overriding with superclass references.
5. Write a small Java application using multiple classes to integrate inheritance, encapsulation, abstraction and polymorphism for managing system entities.

UNIT – III	INHERITANCE AND INTERFACES	(3+18)

Inheritance – Super classes and Subclasses – Protected Members – Constructors in Subclasses – The Object Class – Abstract Classes and Methods – Final Methods and Classes – Interfaces – Defining and Implementing Interfaces – Differences Between Classes and Interfaces – Extending Interfaces – Polymorphism with Inheritance – Strings.

List of Experiments:

1. Create a Java program to demonstrate inheritance by defining a superclass and one or more subclasses, illustrating the use of protected members and constructor chaining between the superclass and subclasses.
2. Construct a Java program that overrides methods of the Object class and uses abstract classes with abstract methods, where subclasses provide their own implementations.
3. Build a Java program to demonstrate the use of final methods and final classes and show how they restrict inheritance and method overriding.
4. Create Java programs using interfaces to enforce behavior through interface contracts, demonstrate multiple inheritance using interfaces, and show interface extension.
5. Write a Java program to demonstrate runtime polymorphism using inheritance, where a superclass reference invokes overridden subclass methods, including suitable operations using Java Strings.

UNIT– IV	EXCEPTION HANDLING AND I/O	(3+18)

Exceptions – Exception Hierarchy – Throwing and Catching Exceptions – Built-in Exceptions – Creating User-Defined Exceptions – Stack Trace Elements – I/O Basics – Streams – Byte Streams and Character Streams – Reading and Writing Console – Reading and Writing Files.

List of Experiments:

1. Implement a Java program to demonstrate basic exception handling using try, catch, and finally blocks, including handling of common built-in runtime exceptions.
2. Develop a Java program to illustrate the exception hierarchy by handling multiple related exceptions and explicitly using the throw and throws keywords.
3. Implement a Java program that defines and applies a user-defined exception and displays stack trace details to show how exceptions propagate through method calls.
4. Develop a Java program demonstrating basic input and output operations using standard input and output streams.
5. Implement a Java program that performs file handling by reading data from a text file and writing data to another file using appropriate byte and character streams.

UNIT – V	MULTITHREADING AND COLLECTIONS	(3+18)

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Multithreading vs. Multitasking – Thread Life Cycle – Creating Threads – Synchronizing Threads – Interthread Communication – Daemon Threads – Inner Classes – ArrayList – Basics of Collections Framework – Generics – Generic Classes – Generic Methods.

List of Experiments:

1. Create a Java program to start multiple threads using the Thread class and Runnable interface, and demonstrate synchronization for shared resource access.
2. Develop a Java program to illustrate the thread life cycle, inter thread communication using wait(), notify() or notifyAll() and the behavior of daemon threads.
3. Build a Java program using inner classes to organize thread-related tasks within an outer class.
4. Write a Java program using the Collections Framework, specifically ArrayList, to store, retrieve, add, remove, and traverse dynamic data entered by the user.
5. Implement a Java program to demonstrate generic programming by designing a generic class and a generic method to perform operations on multiple data types.

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

COs	Course Outcome	Cognitive Level
CO1	Outline the fundamentals of Java programming including data types, variables, operators, control structures, arrays, classes, constructors, and packages for developing basic programs.	Understand
CO2	Design modular Java programs using object-oriented principles such as abstraction, encapsulation, inheritance and polymorphism.	Apply
CO3	Implement inheritance, interfaces, abstract classes and final methods to develop reusable and extensible Java applications.	Apply
CO4	Develop robust Java programs using exception handling mechanisms and file-based input/output operations.	Apply
CO5	Apply multithreading concepts, collections framework and generics to build efficient and scalable Java applications.	Apply

TEXT BOOKS:

1. Herbert Schildt, Dr.Danny Coward, Java - The Complete Reference, McGraw-Hill Education, Thirteenth Edition, 2023.
2. Cay S. Horstmann, Core Java Volume I & II, Prentice Hall, Thirteenth Edition, 2024.

REFERENCES:

1. Herbert Schildt, Java - A Beginner Guide, Oracle Press, McGraw-Hill Education, Tenth Edition, 2024.
2. Joshua Bloch, Effective Java: A Programming Language Guide, Addison-Wesley Professional, Fourth Edition, 2023.
3. Allen B. Downey and Chris Mayfield, Think Java: How to Think Like a Computer Scientist, O'Reilly, Second Edition, 2019.
4. https://onlinecourses.nptel.ac.in/noc22_cs47/preview.
5. To practice: www.codingbat.com and www. Geeks for geeks. Com.

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Mapping of COs with POs and PSOs													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PSO 1	PSO 2
CO1	3	2	-	-	2	-	-	1	-	-	3	3	2
CO2	3	3	2	-	2	-	-	1	-	-	3	3	2
CO3	3	3	2	-	2	-	-	1	-	-	3	3	2
CO4	3	3	2	-	2	-	-	1	-	-	3	3	2
CO5	3	3	2	-	2	-	-	1	-	-	3	3	2
1-low, 2-medium, 3-high													

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

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.

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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.

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Dr. R.V.M. RANGARAJAN
CHAIRMAN
BOARD OF STUDIES (S&H)
K.S.R. COLLEGE OF ENGINEERING
TIRUCHENGODE

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, 7th 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

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24ECI26	DIGITAL PRINCIPLES AND SYSTEM DESIGN	Category	L	T	P	SL	C
		PCC	45	0	30	45	4

PREREQUISITE:
Students should have basic knowledge on binary numbers, logic gates, algebra and discrete mathematics.

OBJECTIVE:
This course provides a comprehensive understanding of digital logic design, covering number systems, Boolean algebra, combinational and sequential circuits, and processor architecture. It equips students with the skills to design and analyze digital systems using logic gates, Karnaugh maps, and Hardware Description Languages (HDL).

UNIT - I	BOOLEAN ALGEBRA AND LOGIC GATES	(9)

Review of Number Systems – Arithmetic Operations – Binary Codes – Boolean Algebra and Theorems – Boolean Functions – Simplification of Boolean Functions using Karnaugh Map and Tabulation Methods – Logic Gates.

UNIT - II	COMBINATIONAL LOGIC	(9)

Combinational Circuits – Analysis and Design Procedures – Adder and Subtractor – Magnitude Comparator – Code Converters – Decoders and Encoders – Multiplexers and Demultiplexers.

UNIT - III	SYNCHRONOUS SEQUENTIAL LOGIC	(9)

Sequential Circuits – Latches and Flip Flops – Analysis and Design Procedures – State Reduction and State. Assignment – Shift Registers – Counters.

UNIT - IV	PROCESSOR DESIGN	(9)

Processor Organization – Design of ALU: Arithmetic Circuits – Logic Circuits – Arithmetic Logic Unit – Status Register – Design of Shifter – Processor Unit.

UNIT - V	SIMPLE COMPUTER DESIGN AND HDL	(9)

Inter Register Transfer – Conditional Control Statements – Instruction Codes – Design of a Simple Computer – Hardware Description Language (HDL) for Combinational Circuits and Sequential Logic Circuits

List of Experiments:

1. Verification of Boolean theorems using logic gates.
2. Design and implementation of combinational circuits using logic gates for arbitrary functions, Code Converters.
3. Design and implementation of combinational circuits using MSI devices:
   a) 4 - bit binary adder / subtractor
   b) Parity generator / checker
   c) Multiplexers and De-Multiplexers
4. Design and implementation of sequential circuits:
   a) Shift-registers
   b) Synchronous counter
5. HDL Models for combinational / sequential circuits.

TOTAL(T:45, P:30, SL:45) : 120 PERIODS

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

COs	Course Outcome	Exp. No	Cognitive Level
CO1	Apply Boolean theorems and techniques, Karnaugh Map and Tabulation method for simplifying Boolean functions.	1	Apply
CO2	Develop skills to design and analyze combinational logic circuits, including adders, subtractors, and multiplexers.	2,3	Apply
CO3	Design synchronous sequential circuits using latches, flip-flops	4	Apply
CO4	Design processors which include arithmetic and logic circuits.	4	Apply

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CO5	Design simple computer architectures and implement using HDL for both combinational and sequential logic circuits	5	Apply

TEXT BOOKS:

1. Morris Mano, M., "Digital Logic and Computer Design", Prentice-hall of India private limited, First Edition, 2016.
2. John F. Wakerly, "Digital Design Principles and Practices", Pearson Education, Fourth Edition, 2008.

REFERENCES:

1. Charles H. Roth Jr, "Fundamentals of Logic Design", Jaico Publishing House, Fifth Edition, 2003.
2. Kharate, G.K., "Digital Electronics", Oxford University Press, First Edition, 2012.
3. Morris Mano, M., and Michael D. Ciletti, "Digital Design", Pearson Education, Fifth Edition, 2013.
4. Donald D. Givone, "Digital Principles and Design", Tata Mcgraw Hill, First Edition, 2003.

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

LIST OF EQUIPMENT (For a batch of 30 students)

Sl.No.	Name of the Equipment	Qty
1	Digital IC Tester	2
2	Digital IC Trainer Kit	15
3	Dual/Single Mode Power Supply	15
4	Digital Multimeter	5
5	Computer with HDL Simulation Software	5
6	IC7400	50
7	IC7404	50
8	IC7402	50
9	IC7408	50
10	IC7411	50
11	IC7432	50
12	IC7483	50
13	IC7485	50
14	IC7486	50
15	IC7474	50
16	IC7476	50
17	IC7447	50
18	Bread Board	20
19	Wires	Sufficient Quantity

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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

2

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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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