KSR College of Engineering

NAAC ACCREDITED A++ | NBA ACCREDITED PROGRAMMES

AN AUTONOMOUS INSTITUTION

B.E. - COMPUTER SCIENCE & ENGINEERING (IOT)

Curriculum &
Syllabus for Semester I and II

REGULATIONS 2024

(Academic Year 2024-25 Onwards)

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

(Autonomous)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (IoT)

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

(REGULATIONS 2024)

Vision of the Institution

IV	We envision to achieve status as an excellent educational institution in the global knowledge hub, making self-learners, experts, ethical and responsible engineers, technologists, scientists, managers, administrators and entrepreneurs who will significantly contribute to research and environment friendly sustainable growth of the nation and the world.

Mission of the Institution

IM 1	To inculcate in the students self-learning abilities that enable them to become competitive and considerate engineers, technologists, scientists, managers, administrators and entrepreneurs by diligently imparting the best of education, nurturing environmental and social needs.
IM 2	To foster and maintain a mutually beneficial partnership with global industries and institutions through knowledge sharing, collaborative research and innovation.

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

DV	To emerge as a leading technical education in the field of Internet of things with a focus on developing professionally competent and socially profound engineers capable of working in global environment.

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

DM 1	To provide state- of- the art facilities to build up the students in industry- ready IoT system development.
DM 2	To impart the spirit of team work, societal responsibilities and professionalism among the students and faculty.
DM 3	To inculcate learning of the emerging technologies thereby helping the students to pursue higher studies leading to lifelong learning.

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

The graduates of the programme will be able to	
PEO 1	**Socio Economic Pursuit:** To promote innovation and creativity to adopt the socio-economic related activities.
PEO 2	**Professional Eminence:** To pursue successful careers in industry, academia and public service, by applying the acquired knowledge of Engineering, providing technical leadership for their business, as well as other professional careers.
PEO 3	**Morality Expert:** To instill management qualities in graduates with an experience of confidence, professionalism and moral attitude to provide expert leaders for serving the society.

Programme Outcomes (POs) of B.E. – Computer Science and Engineering (IoT)

Program Outcomes (POs)	
PO1	**Engineering Knowledge:** Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
PO2	**Problem Analysis:** Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
PO3	**Design/Development of Solutions:** Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
PO4	**Conduct Investigations of Complex Problems:** Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).
PO5	**Engineering Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6).
PO6	**The Engineer and The World:** Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
PO7	**Ethics:** Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
PO8	**Individual and Collaborative Team work**: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
PO9	**Communication:** Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.
PO10	**Project Management and Finance:** Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
PO11	**Life-Long Learning:** Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)
Program Specific Outcomes (PSOs)	
PSO1	**Skill Intensification:** The ability to formulate mathematical models and problem solving skills through programming techniques for addressing real-world challenges while applying suitable Internet of Things principles and concepts.
PSO2	**Persistence Exploration:** Foster lifelong learning and improve research skills to develop creative, cost-effective techniques for producing energy-efficient and eco- friendly integrated solutions for existing and new applications related to Internet of Things technology and applications.

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

SEMESTER I

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
Induction Programme			-	-	-	-	-	-	-	-	-
THEORY COURSES											
1	24ENT19	Professional Communication	HSMC	3	0	0	3	**3**	40	60	100
2	24EET06	Basics of Electrical and Electronics Engineering	ESC	3	0	0	3	**3**	40	60	100
3	24ITT16	Programming for Problem Solving	ESC	3	0	0	3	**3**	40	60	100
4	24GET19	தமிழ் மரபு / Heritage of Tamils	HSMC	1	0	0	1	**1**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT											
5	24MAI19	Matrices and Calculus	BSC	2	1	2	5	**4**	50	50	100
6	24CHI06	Chemistry for Engineers	BSC	3	0	2	5	**4**	50	50	100
LABORATORY COURSES											
7	24ITP16	Programming for Problem Solving Laboratory	ESC	0	0	2	2	**1**	60	40	100
8	24MEP16	Engineering Graphics Laboratory	ESC	1	0	2	3	**2**	60	40	100
9	24GEP16	Engineering Experience Laboratory	ESC	0	0	2	2	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE											
10	24SSP19	Aptitude and Coding Skills-I	EEC	0	0	2	2	**1**	60	40	100
TOTAL				**16**	**1**	**12**	**29**	**23**	**1000**		

SEMESTER II											
S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1	24CST29	Python Programming	PCC	3	0	0	3	**3**	40	60	100
2	24CST21	Design Thinking	PCC	2	0	0	2	**2**	40	60	100
3	24GET29	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	HSMC	1	0	0	1	**1**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT											
4	24MAI29	Probability and Statistics	BSC	2	1	2	5	**4**	50	50	100
5	24PHI07	Engineering Physics	BSC	3	0	2	5	**4**	50	50	100
6	24ECI26	Digital Principles and System Design	ESC	3	0	2	5	**4**	40	60	100
LABORATORY COURSES											
7	24ENP29	Professional Communication Laboratory	HSMC	0	0	2	2	**1**	60	40	100
8	24CSP29	Python Programming Laboratory	PCC	0	0	2	2	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE											
9	24SSP29	Aptitude and Coding Skills-II	EEC	0	0	2	2	**1**	60	40	100
MANDATORY COURSE											
10		Mandatory Course – I	MC	0	0	2	2	**0**	--	---	---
TOTAL				**14**	**1**	**14**	**29**	**21**	**900**		

SEMESTER III											
S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1	24MAT37	Discrete Mathematics	BSC	3	1	0	4	**4**	40	60	100
2	24CST36	Data Structures and Algorithms	PCC	3	0	0	3	**3**	40	60	100
3	24CST37	Java Programming	PCC	3	0	0	3	**3**	40	60	100
4	24IOT31	Operating Systems for IoT	PCC	3	0	0	3	**3**	40	60	100
5	24IOT32	IoT Architecture and its Applications	PCC	3	0	0	3	**3**	40	60	100
LABORATORY COURSES											
6	24CSP36	Data structures and Algorithms Laboratory	PCC	0	0	2	2	**1**	60	40	100
7	24CSP37	Java Programming Laboratory	PCC	0	0	2	2	**1**	60	40	100
8	24IOP31	Operating Systems for IoT Laboratory	PCC	0	0	2	2	**1**	60	40	100
9	24CDP32	Design Studio – I	PCC	0	0	2	2	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE											
10	24SSP39	Aptitude and Coding Skills-III	EEC	0	0	2	2	**1**	60	40	100
TOTAL				**15**	**1**	**10**	**26**	**21**	**1000**		

SEMESTER IV											
S. No.	**Course Code**	**Course Title**	**Category**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
THEORY COURSES											
1	24MAT46	Linear Algebra and Numerical Methods	BSC	3	1	0	4	**4**	40	60	100
2	24ITT46	Database Management Systems	PCC	3	0	0	3	**3**	40	60	100
3	24ECT46	Microprocessors and Microcontrollers	ESC	3	0	0	3	**3**	40	60	100
4	24IOT46	Foundation of Data Science	PCC	3	0	0	3	**3**	40	60	100
5	24GET49	Universal Human Values	HSMC	3	0	0	3	**3**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT											
6	24IOI41	Sensors and Actuator Devices	PCC	3	0	2	5	**4**	50	50	100
LABORATORY COURSES											
7	24ITP46	Database Management Systems Laboratory	PCC	0	0	2	2	**1**	60	40	100
8	24ECP46	Microprocessors and Microcontrollers laboratory	ESC	0	0	2	2	**1**	60	40	100
9	24CDP41	Design Studio-II	PCC	0	0	2	2	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE											
10	24SSP49	Aptitude and Coding Skills-IV	EEC	0	0	2	2	**1**	60	40	100
TOTAL				**18**	**1**	**10**	**29**	**24**	**1000**		

SEMESTER V											
S. No.	**Course Code**	**Course Title**	**Category**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
THEORY COURSES											
1	24CST56	Computer Networks	PCC	3	0	0	3	**3**	40	60	100
2	24CDT06	Principles of Compiler Design	PCC	3	1	0	4	**4**	40	60	100
3	24IOT56	Artificial Intelligence	PCC	3	0	0	3	**3**	40	60	100
4		Professional Elective – I	PEC	3	0	0	3	**3**	40	60	100
5		Professional Elective – II	PEC	3	0	0	3	**3**	40	60	100
6		Open Elective – I	OEC	3	0	0	3	**3**	40	60	100
LABORATORY COURSES											
7	24CSP56	Networks Laboratory	PCC	0	0	2	2	**1**	60	40	100
8	24IOP51	Artificial Intelligence Laboratory	PCC	0	0	2	2	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE											
9	24IOP52	Internship – I*	EEC	0	0	0	0	**1**	-	100	100
MANDATORY COURSE											
10		Mandatory Course – II	MC	2	0	0	2	**0**	100	-	100
TOTAL				**20**	**1**	**4**	**25**	**22**	**1000**		

*** The Students should undergo internship during the IV semester summer vacation**

SEMESTER VI											
S. No.	**Course Code**	**Course Title**	**Category**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
THEORY COURSES											
1	24IOT61	Essentials of Web Programming	PCC	3	0	0	3	**3**	40	60	100
2	24IOT62	Privacy and Security in IoT	PCC	3	0	0	3	**3**	40	60	100
3	24IOT67	IoT and Cloud Computing	PCC	3	0	0	3	**3**	40	60	100
4		Professional Elective – III	PEC	3	0	0	3	**3**	40	60	100
5		Professional Elective – IV	PEC	3	0	0	3	**3**	40	60	100
6		Open Elective – II	OEC	3	0	0	3	**3**	40	60	100
LABORATORY COURSE											
7	24IOP66	IoT and Cloud Computing Laboratory	PCC	0	0	2	2	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE											
8	24IOP67	Mini Project	EEC	0	0	4	4	**2**	60	40	100
MANDATORY COURSE											
9		Mandatory Course – III	MC	2	0	0	2	**0**	100	--	100
TOTAL				**20**	**0**	**6**	26	**21**	**900**		

SEMESTER VII											
S. No.	**Course Code**	**Course Title**	**Category**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
THEORY COURSES											
1	24GET79	Professional Ethics	HSMC	3	0	0	3	**3**	40	60	100
2	24IOT71	Programming with IoT Computing Boards	PCC	3	1	0	4	**4**	40	60	100
3		Management Elective	HSMC	3	0	0	3	**3**	40	60	100
4		Professional Elective – V	PEC	3	0	0	3	**3**	40	60	100
5		Professional Elective – VI	PEC	3	0	0	3	**3**	40	60	100
6		Open Elective –III	OEC	3	0	0	3	**3**	40	60	100
LABORATORY COURSE											
7	24IOP71	Programming with IoT Computing Boards Laboratory	PCC	0	0	2	2	**1**	50	50	100
EMPLOYABILITY ENHANCEMENT COURSE											
8	24IOP72	Project work Phase - I	EEC	0	0	4	4	**2**	60	40	100
9	24IOP73	Internship – II*	EEC	0	0	0	0	**1**	-	100	100
TOTAL				**18**	**1**	**6**	**25**	**23**	**900**		
*** The Students should undergo internship during the VI semester summer vacation**											

SEMESTER VIII											
S. No.	**Course Code**	**Course Title**	**Category**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
EMPLOYABILITY ENHANCEMENT COURSE											
1.	24IOP81	Project Work Phase – II	EEC	0	0	16	16	**8**	40	60	100
TOTAL				0	0	16	16	**8**	**100**		
TOTAL CREDITS								**163**			

TOTAL NMBER 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.

HUMANITIES, SOCIAL SCIENCE AND MANAGEMENT COURSES (HSMC)											
S. No.	**Course Code**	**Course Title**	**Semester**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
1	24ENT19	Professional Communication	I	3	0	0	3	**3**	40	60	100
2	24GET19	தமிழ் மரபு / Heritage of Tamils	I	1	0	0	1	**1**	40	60	100
3	24GET29	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	II	1	0	0	1	**1**	40	60	100
4	24ENP29	Professional Communication Laboratory	II	0	0	2	2	**1**	60	40	100
5	24GET49	Universal Human Values	IV	3	0	0	3	**3**	40	60	100
6	24GET79	Professional Ethics	VII	3	0	0	3	**3**	40	60	100
7	24MGTXX	Management Elective	VII	3	0	0	3	**3**	40	60	100
TOTAL				**14**	**0**	**2**	**16**	**15**	300	400	700

BASIC SCIENCE COURSES (BSC)											
S. No.	**Course Code**	**Course Title**	**Semester**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
1	24MAI19	Matrices and Calculus	I	2	1	2	5	**4**	50	50	100
2	24CHI06	Chemistry for Engineers	I	3	0	2	5	**4**	50	50	100
3	24MAI29	Probability and Statistics	II	2	1	2	5	**4**	50	50	100
4	24PHI07	Engineering Physics	II	3	0	2	5	**4**	50	50	100
5	24MAT37	Discrete Mathematics	III	3	1	0	4	**4**	40	60	100
6	24MAT46	Linear Algebra and Numerical Methods	IV	3	1	0	4	**4**	40	60	100
TOTAL				**16**	**4**	**8**	**28**	**24**	280	320	600

ENGINEERING SCIENCESCOURSES (ESC)											
S. No.	**Course Code**	**Course Title**	**Semester**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
1	24EET06	Basics of Electrical and Electronics Engineering	I	3	0	0	3	**3**	40	60	100
2	24ITT16	Programming for Problem Solving	I	3	0	0	3	**3**	40	60	100
3	24ITP16	Programming for Problem Solving Laboratory	I	0	0	2	2	**1**	60	40	100
4	24MEP16	Engineering Graphics Laboratory	I	1	0	2	3	**2**	60	40	100
5	24GEP16	Engineering Experience Laboratory	I	0	0	2	2	**1**	60	40	100
6	24ECI26	Digital Principles and System Design	II	3	0	2	5	**4**	40	60	100
7	24ECT46	Microprocessors and Microcontrollers	IV	3	0	0	3	**3**	40	60	100
8	24ECP46	Microprocessors and Microcontrollers laboratory	IV	0	0	2	2	**1**	60	40	100
TOTAL				13	0	10	23	**18**			800

EMPLOYABILITY ENHANCEMENT COURSES (EEC)											
S. No.	**Course Code**	**Course Title**	**Semester**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
1	24SSP19	Aptitude and Coding Skills-I	I	0	0	2	2	**1**	60	40	100
2	24SSP29	Aptitude and Coding Skills-II	II	0	0	2	2	**1**	60	40	100
3	24SSP39	Aptitude and Coding Skills-III	III	0	0	2	2	**1**	60	40	100
4	24SSP49	Aptitude and Coding Skills-IV	IV	0	0	2	2	**1**	60	40	100
5	24IOP52	Internship – I	V	0	0	2	2	**1**	-	100	100
6	24IOP67	Mini Project	VI	0	0	4	4	**2**	60	40	100
7	24IOP72	Project work Phase - I	VII	0	0	4	4	**2**	60	40	100
8	24IOP73	Internship – II	VII	0	0	2	2	**1**	-	100	100
9	24IOP81	Project Work Phase – II	VIII	0	0	16	16	**8**	60	40	100
TOTAL				**0**	**0**	**36**	**36**	**18**	800	100	900

PROFESSIONAL CORE COURSES (PCC)											
S. No.	**Course Code**	**Course Title**	**Semester**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
1	24CST29	Python Programming	II	3	0	0	3	**3**	40	60	100
2	24CSP29	Python Programming Laboratory	II	0	0	2	2	**1**	60	40	100
3	24CST21	Design Thinking	II	2	0	0	2	**2**	40	60	100
4	24CST37	Java Programming	III	3	0	0	3	**3**	40	60	100
5	24CST36	Data Structures and Algorithms	III	3	0	0	3	**3**	40	60	100
6	24CSP36	Data structures and Algorithms Laboratory	III	0	0	2	2	**1**	60	40	100
7	24IOT31	Operating systems for IoT	III	3	0	0	3	**3**	40	60	100
8	24IOT32	IoT Architecture and its Applications	III	3	0	0	3	**3**	40	60	100
9	24CSP37	Java Programming Laboratory	III	0	0	2	2	**1**	60	40	100
10	24IOP31	Operating Systems for IoT Laboratory	III	0	0	2	2	**1**	60	40	100
11	24CDP32	Design Studio – I	III	0	0	2	2	**1**	100	--	100
12	24ITT46	Database Management Systems	IV	3	0	0	3	**3**	40	60	100
14	24IOT46	Foundation of Data Science	IV	3	0	0	3	**3**	40	60	100
15	24ITP46	Database Management Systems Laboratory	IV	0	0	2	2	**1**	60	40	100
16	24CDP41	Design Studio-II	IV	0	0	2	2	1	100	---	100
17	24CST56	Computer Networks	V	3	0	0	3	**3**	40	60	100
18	24CDT06	Principles of Compiler Design	V	3	1	0	4	**4**	40	60	100
19	24IOT56	Artificial Intelligence	V	3	0	0	3	**3**	40	60	100
20	24CSP56	Networks Laboratory	V	0	0	2	2	**1**	60	40	100
21	24IOP51	Artificial Intelligence Laboratory	V	0	0	2	2	**1**	60	40	100
22	24IOT61	Essentials of Web Programming	VI	3	0	0	3	**3**	40	60	100
23	24IOT62	Privacy and Security in IoT	VI	3	0	0	3	**3**	40	60	100
24	24IOT67	IoT and Cloud Computing	VI	3	0	0	3	**3**	40	60	100
25	24IOP66	IoT and Cloud Computing Laboratory	VI	0	0	2	2	**1**	60	40	100
26	24IOT71	Programming with IoT Computing Boards	VII	3	1	0	4	**4**	40	60	100
27	24IOP71	Programming with IoT Computing Boards Laboratory	VII	0	0	2	2	**1**	50	50	100
TOTAL				**44**	**2**	**22**	**68**	**55**	1040	1160	2700

PROFESSIONAL ELECTIVE COURSES (PEC) : VERTICALS					
VERTICAL-1	**VERTICAL-2**	**VERTICAL-3**	**VERTICAL-4**	**VERTICAL-5**	**VERTICAL-6**
DATA SCIENCE	**FULL STACK DEVELOPMENT**	**EMERGING TECHNOLOGIES**	**ARTIFICIAL INTELLIGENCEAND MACHINE LEARNING**	**CYBER SECURITY AND DATA PRIVACY**	**INTERNET OF THINGS**
Data Warehousing and Data Mining	Fundamentals of DevOps	UI and UX Design	Neural Networks and Deep Learning	Engineering Secure Software Systems	Adhoc and Wireless Sensor Networks
Distributed Computing	Mobile Computing	Augmented Reality/ Virtual Reality	Knowledge Engineering	Cyber threat intelligence	Python Programming for IoT
Big Data Analytics	C# and .Net Framework	Computer Graphics for Virtual Reality	Computer Vision	Steganography and Digital Watermarking	Open Source Programming for IoT
Business Intelligence	Software Testing And Automation	Introduction to Robotics	Game Theory	Crypto-Currency and Block chain Technologies	Introduction to Industry 4.0
Data Modelling	Full Stack Framework	Virtualization	AI in Health Care Analytics	Digital and Mobile Forensics	Industrial and Medical IoT
Exploratory DataAnalysis	Open Source Technologies	Cloud Services Management	Text and Speech Analysis	Ethical Hacking	IoT and Multimedia Technology
Quantum Computing	Agile software development	Modern Web Application Development	Machine learning for Bioinformatics	Firewalls and Intrusion Detection System	Design of Smart Cities
Scientific and Engineering Data Visualization	Object oriented analysis and design	Android Application Development	Genetic Algorithms	Secure Software Engineering	Applications of IoT in Robotics

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
VERTICAL 1: DATA SCIENCE											
1	24IOE01	Data Warehousing and Data Mining	PEC	3	0	0	3	**3**	40	60	100
2	24IOE02	Distributed Computing	PEC	3	0	0	3	**3**	40	60	100
3	24IOE03	Big Data Analytics	PEC	3	0	0	3	**3**	40	60	100
4	24IOE04	Business Intelligence	PEC	3	0	0	3	**3**	40	60	100
5	24IOE05	Data Modelling	PEC	3	0	0	3	**3**	40	60	100
6	24IOE06	Exploratory Data Analysis	PEC	3	0	0	3	**3**	40	60	100
7	24IOE07	Quantum Computing	PEC	3	0	0	3	**3**	40	60	100
8	24IOE08	Scientific and Engineering Data Visualization	PEC	3	0	0	3	**3**	40	60	100
VERTICAL 2: FULL STACK DEVELOPMENT											
1	24CSE05	Fundamentals of DevOps	PEC	3	0	0	3	**3**	40	60	100
2	24CSE06	Mobile Computing	PEC	3	0	0	3	**3**	40	60	100
3	24CSE07	C# and .Net Framework	PEC	3	0	0	3	**3**	40	60	100
4	24CSE08	Software Testing and Automation	PEC	3	0	0	3	**3**	40	60	100
5	24CSE09	Full Stack Framework	PEC	3	0	0	3	**3**	40	60	100
6	24CSE10	Open Source Technologies	PEC	3	0	0	3	**3**	40	60	100
7	24CSE11	Agile software development	PEC	3	0	0	3	**3**	40	60	100
8	24CSE12	Object oriented analysis and design	PEC	3	0	0	3	**3**	40	60	100
VERTICAL 3: EMERGING TECHNOLOGIES											
1	24CDE01	UI and UX Design	PEC	3	0	0	3	**3**	40	60	100
2	24CDE02	Augmented Reality/ Virtual Reality	PEC	3	0	0	3	**3**	40	60	100
3	24CDE03	Computer Graphics for Virtual Reality	PEC	3	0	0	3	**3**	40	60	100
4	24CDE04	Introduction to Robotics	PEC	3	0	0	3	**3**	40	60	100
5	24IOE09	Virtualization	PEC	3	0	0	3	**3**	40	60	100
6	24IOE10	Cloud Services Management	PEC	3	0	0	3	**3**	40	60	100
7	24CDE07	Modern Web Application Development	PEC	3	0	0	3	**3**	40	60	100
8	24CDE08	Android Application Development	PEC	3	0	0	3	**3**	40	60	100

VERTICAL 4: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING											
1	24ITE01	Neural Networks and Deep Learning	PEC	3	0	0	3	**3**	40	60	100
2	24ITE02	Knowledge Engineering	PEC	3	0	0	3	**3**	40	60	100
3	24ITE03	Computer Vision	PEC	3	0	0	3	**3**	40	60	100
4	24ITE04	Game Theory	PEC	3	0	0	3	**3**	40	60	100
5	24ITE05	AI in Health Care Analytics	PEC	3	0	0	3	**3**	40	60	100
6	24ITE06	Text and Speech Analysis	PEC	3	0	0	3	**3**	40	60	100
7	24ITE07	Machine Learning for Bioinformatics	PEC	3	0	0	3	**3**	40	60	100
8	24ITE08	Genetic Algorithms	PEC	3	0	0	3	**3**	40	60	100
VERTICAL 5: CYBER SECURITY AND DATA PRIVACY											
1	24IOE11	Engineering Secure Software Systems	PEC	3	0	0	3	**3**	40	60	100
2	24CBE02	Cyber threat intelligence	PEC	3	0	0	3	**3**	40	60	100
3	24CBE03	Steganography and Digital Watermarking	PEC	3	0	0	3	**3**	40	60	100
4	24CBE04	Crypto-Currency and Block chain Technologies	PEC	3	0	0	3	**3**	40	60	100
5	24CBE05	Digital and Mobile Forensics	PEC	3	0	0	3	**3**	40	60	100
6	24IOE12	Ethical Hacking	PEC	3	0	0	3	**3**	40	60	100
7	24CBE07	Firewalls and Intrusion Detection System	PEC	3	0	0	3	**3**	40	60	100
8	24CBE08	Secure Software Engineering	PEC	3	0	0	3	**3**	40	60	100
VERTICAL 6: INTERNET OF THINGS											
1	24IOE13	Adhoc and Wireless Sensor Networks	PEC	3	0	0	3	**3**	40	60	100
2	24IOE14	Python Programming for IoT	PEC	3	0	0	3	**3**	40	60	100
3	24IOE15	Open Source Programming for IoT	PEC	3	0	0	3	**3**	40	60	100
4	24IOE16	Introduction to Industry 4.0	PEC	3	0	0	3	**3**	40	60	100
5	24IOE17	Industrial and Medical IoT	PEC	3	0	0	3	**3**	40	60	100
6	24IOE18	IoT and Multimedia Technology	PEC	3	0	0	3	**3**	40	60	100
7	24IOE19	Design of Smart Cities	PEC	3	0	0	3	**3**	40	60	100
8	24IOE20	Applications of IoT in Robotics	PEC	3	0	0	3	**3**	40	60	100

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
MANAGEMENT ELECTIVES											
1	24MGT01	Total Quality Management	HSMC	3	0	0	3	**3**	40	60	100
2	24MGT02	Principles of Management	HSMC	3	0	0	3	**3**	40	60	100
3	24MGT03	Engineering Economics and Financial Accounting	HSMC	3	0	0	3	**3**	40	60	100
4	24MGT04	Human Resource Management	HSMC	3	0	0	3	**3**	40	60	100
5	24MGT05	Industrial Management	HSMC	3	0	0	3	**3**	40	60	100
MANDATORY COURSE – I, II & III											
1	24MCP09	Yoga for Stress Management	MC	0	0	2	2	0	-	-	-
2	24MCT01	Constitution of India	MC	2	0	0	2	0	100	-	100
3	24MCT02	Environmental Science and Sustainability	MC	2	0	0	2	0	100	-	100
4	24MCT03	Introduction to Gender Studies	MC	2	0	0	2	0	100	-	100
5	24MCT04	Life Science for Engineers	MC	2	0	0	2	0	100	-	100
6	24MCT05	Industrial Safety	MC	2	0	0	2	0	100	-	100
7	24MCT06	Essence of Indian Knowledge System	MC	2	0	0	2	0	100	-	100
8	24MCT07	Elements of Literature	MC	2	0	0	2	0	100	-	100
9	24MCT08	Disaster Management	MC	2	0	0	2	0	100	-	100
OPEN ELECTIVE COURSES											
1.	24AUO01	Basics of Automobile Engineering	OEC	3	0	0	3	3	40	60	100
2.	24AUO02	Automotive Engine Technology	OEC	3	0	0	3	3	40	60	100
3.	24AUO03	Automotive Vehicle Technology	OEC	3	0	0	3	3	40	60	100
4.	24AUO04	Automotive Safety	OEC	3	0	0	3	3	40	60	100
5.	24AUO05	Hybrid Vehicles	OEC	3	0	0	3	3	40	60	100
6.	24AUO06	Off Highway Vehicles	OEC	3	0	0	3	3	40	60	100
7.	24AUO07	Modern and Intelligent Vehicle System	OEC	3	0	0	3	3	40	60	100
8.	24AUO08	Vehicle Maintenance	OEC	3	0	0	3	3	40	60	100
9.	24BMO01	Basics of Biomedical Instrumentation	OEC	3	0	0	3	3	40	60	100
10.	24BMO02	Imaging Equipments	OEC	3	0	0	3	3	40	60	100
11.	24BMO03	Biometric systems	OEC	3	0	0	3	3	40	60	100
12.	24BMO04	Human Assist Devices	OEC	3	0	0	3	3	40	60	100

13.	24BMO05	Medical Informatics	OEC	3	0	0	3	3	40	60	100
14.	24BMO06	Medical Innovation and Entrepreneurship	OEC	3	0	0	3	3	40	60	100
15.	24CEO01	Architecture Heritage of India	OEC	3	0	0	3	3	40	60	100
16.	24CEO02	Elementary Civil Engineering	OEC	3	0	0	3	3	40	60	100
17.	24CEO03	Modern Construction Materials	OEC	3	0	0	3	3	40	60	100
18.	24CEO04	Water and Air Pollution Management	OEC	3	0	0	3	3	40	60	100
19.	24CEO05	Water Harvesting and Management	OEC	3	0	0	3	3	40	60	100
20.	24EEO01	Electrical Drives and Control	OEC	3	0	0	3	3	40	60	100
21.	24EEO02	Electrical Power Generation Systems	OEC	3	0	0	3	3	40	60	100
22.	24EEO03	Industrial Automation	OEC	3	0	0	3	3	40	60	100
23.	24EEO04	Electrical Instruments and Measurements	OEC	3	0	0	3	3	40	60	100
24.	24EEO05	Energy Conservation and Management	OEC	3	0	0	3	3	40	60	100
25.	24EEO06	Electrical Wiring, Estimation and Costing	OEC	3	0	0	3	3	40	60	100
26.	24EEO07	Fundamentals of Electrical Machinery	OEC	3	0	0	3	3	40	60	100
27.	24EEO08	Fundamentals of Electric Vehicle	OEC	3	0	0	3	3	40	60	100
28.	24ECO01	Consumer Electronics	OEC	3	0	0	3	3	40	60	100
29.	24ECO02	NANO Technology	OEC	3	0	0	3	3	40	60	100
30.	24ECO03	Fundamentals of Robotics	OEC	3	0	0	3	3	40	60	100
31.	24ECO04	Principles of Communication	OEC	3	0	0	3	3	40	60	100
32.	24ECO05	Electronics and Microprocessor	OEC	3	0	0	3	3	40	60	100
33.	24MEO01	Basic Mechanical Engineering	OEC	3	0	0	3	3	40	60	100
34.	24MEO02	Solar Energy Utilization	OEC	3	0	0	3	3	40	60	100
35.	24MEO03	Selection of Materials	OEC	3	0	0	3	3	40	60	100
36.	24MEO04	Fibre Reinforced Plastics	OEC	3	0	0	3	3	40	60	100
37.	24MEO05	Rapid Prototyping	OEC	3	0	0	3	3	40	60	100

No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
38.	24SFO01	Occupational health and hygiene	OEC	3	0	0	3	3	40	60	100
39.	24SFO02	Construction safety	OEC	3	0	0	3	3	40	60	100
40.	24SFO03	Building fire safety	OEC	3	0	0	3	3	40	60	100
41.	24SFO04	Legal aspects of safety	OEC	3	0	0	3	3	40	60	100
42.	24SFO05	Safety measures for engineers	OEC	3	0	0	3	3	40	60	100
OPEN ELECTIVES OFFERED BY THE DEPARTMENT											
1	24IOO01	Internet of Thing and its Applications	OEC	3	0	0	3	3	40	60	100
2	24IOO02	Mobile Application Development	OEC	3	0	0	3	3	40	60	100
3	24IOO03	Sensors and Actuator Devices	OEC	3	0	0	3	3	40	60	100

Summary										
Name of the Programme: B.E Computer Science and Engineering (IoT)										
CATEGORY	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**TOTAL CREDITS**	**%**
HSMC	4	2		3	-	-	6	-	**15**	**9.2**
BSC	8	8	4	4	-	-	-	-	**24**	**14.7**
ESC	10	4	-	4	-	-	-	-	**18**	**11.0**
PCC	-	6	16	12	12	10	5	-	**61**	**37.4**
PEC	-	-	-	-	6	6	6	-	**18**	**11.0**
OEC	-	-	-	-	3	3	3	-	**09**	**5.5**
EEC	1	1	1	1	1	2	3	8	**18**	**11.0**
MC	-	✓	-	-	✓	✓	-	-	**-**	**-**
Total	**23**	**21**	**21**	**24**	**22**	**21**	**23**	**8**	**163**	**100**

Total No. of Credits = 163

Total No. of Credits for Lateral Entry Students = 119

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

(Common to All Branches)

PREREQUISITE:

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

OBJECTIVES:

- To enable learners to compare and contrast the ideas/products in a technical context
- To make learners to critically evaluate the written text and write report and paragraphs
- To facilitate learners' problem based writing and to enable them describe the process/product
- To enable learners to interpret the graphical representation in order to prepare extensive descriptions
- To prepare the learners to draft effective SOP/Resume for job/internships

UNIT - I	UNDERSTANDING COMPARISONS AND CONTRASTS	(9)

Reading- Reading brochures (technical context), telephone messages/ social media messages relevant to technical contexts and emails. **Writing**-Writing emails/letters introducing oneself, -Compare and Contrast Essay. **Grammar** –Present Tenses, - Question types: WH /Yes or No/and Tags. **Vocabulary** - Synonyms; One-word substitution; Abbreviations &Acronyms (as used in technical contexts).

UNIT - II	WRITING REPORTS AND PARAGRAPHS	(9)

Reading-Reading longer technical texts, biographies, travelogues, newspaper reports, Excerpts from literature, and travel &technical blogs, **Writing**-Paragraph writing, Short Report on an event (industrial visit) **Grammar**–Active- Passive Voice transformations, Infinitive and Gerunds, Past Tenses -Subject-Verb Agreement; Prepositions. **Vocabulary**-Word formations (Prefixes &Suffixes); portmanteau words and Antonyms.

UNIT - III	DESCRIBING THE PROCESS/PRODUCT	(9)

Reading-Advertisements, gadget reviews; user manuals, case studies, excerpts from literary texts, news reports etc. **Writing** – Definitions; Instructions; Product/Process description, Checklists, Problem solution essay/Argumentative Essay. **Grammar**–Future Tenses; If conditional clauses. **Vocabulary** – Nominal Compounds, Homonyms and Homophones, Discourse Markers (connectives &sequence words).

UNIT - IV	TRANSCODING AND RECOMMENDATIONS	(9)

Reading–Newspaper articles, Journal reports–and Non verbal Communication (tables, pie charts etc,); **Writing** – Recommendations, Note-making, Transcoding **Grammar**–Articles; Relative pronouns, Modals **Vocabulary**–Collocations and phrasal verbs.

UNIT - V	SUMMATION AND DESCRIPTION	(9)

Reading–Reading editorials; and Opinion Blogs, Company profiles, Statement of Purpose (SOP); **Writing**–Essay Writing(Descriptive or Narrative), Job/Internship Application–Cover letter &Resume; **Grammar**–Numerical adjectives, Relative Clauses, **Vocabulary**-Cause &Effect Expressions–Content Vs Function words.

TOTAL: 45 PERIODS

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

COs	Course Outcome	Cognitive Level
CO1	Compare and contrast products and ideas in technical texts.	Analyse
CO2	Interpret and comprehend the given texts and writing reports/paragraphs	Understand
CO3	Analyze problems in order to arrive at feasible solutions and describe the product/process effectively.	Analyse
CO4	Report events based on the Graphical representation and provide recommendations	Analyse
CO5	Draft effective resume's for job/internships	Apply

TEXT BOOKS:

1 English for Engineers &Technologists, First edition, Orient Blackswan Private Ltd. Department of English, Anna University, 2020.

2 Dr.KN. Shoba, and Dr.Lourdes Joevani, English for Science & Technology Cambridge University Press, Francis Department of English, Anna University, 2021.

REFERENCES:

1 Meenakshi Raman, Sangeeta Sharm, Technical Communication– Principles and Practices, Oxford University .Press, New Delhi, 2016.

2 Lakshminarayanan, A Course Book On Technical English, Scitech Publications (India) Pvt.Ltd, 2012.

3 Aysha Viswamohan, English For Technical Communication, McGraw Hill Education, 2008.

4 Kulbhusan Kumar, R S Salaria, Effective Communication Skill, Khanna Publishing House, 2018.

5 Dr.V.Chellammal, Learning to Communicate–Allied Publishing House, New Delhi, 2003.

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	-	-
Avg.	-	-	-	-	-	-	-	2	3	-	3	-	-

1-low, 2-medium, 3-high

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

(Common to BM, CB, CD, CE, CS, IO, IT, ME, SF)

PREREQUISITE:

Knowledge of mathematics, particularly differential equations, trigonometry, and basic calculus are required.A solid foundation in physics, especially in areas like electromagnetism and mechanics, is also important. Basic problem-solving skills are essential, as it helps to analyze circuits and understand electronic components.

OBJECTIVES:

- To understand the basic definitions and principles governing DC and AC circuits.
- To gain knowledge of the construction, working principles, and applications of DC machines, induction motors, and transformers.
- To recognize the classification of wiring systems, earthing techniques, and the functioning of
- UPS systems.
- To realize the operation and characteristics of semiconductor devices and their applications.
- To impart the fundamentals of digital logic circuits and Arduino components.

UNIT - I	DC AND AC CIRCUITS	(9)

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

AC circuits: Waveforms, average value, RMS value, form factor, peak factor, power and power factor – PureR, 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 startcapacitor 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 andOff- 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.

Total : 45 PERIODS

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

COs	Course Outcome	Cognitive 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 KothariD.P and NagrathI.J, “Basic Electrical and Electronics Engineering”, Second Edition, McGraw Hill, Uttar Pradesh, 2020.

2 BhattacharyaS.K, “Basic Electrical and Electronics Engineering”, Pearson Education, Delhi, Second Edition, 2017.

REFERENCES:

1 JainV.K,Amitabh Bajaj, “Design of Electrical installation”,University Science Press, New Delhi,2016.

2 RamamoortyM, Chandra Sekhar O, “Electrical Machines”, PHI Learning Pvt. Ltd, Delhi,2018.

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

4 KothariD.P,DhillonJ.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	2	-	-	-	-	-	-	-	-	2	1	1
CO2	3	3	2	-	-	-	-	-	-	-	-	2	1	1
CO3	3	3	2	-	-	-	-	-	-	-	-	2	1	1
CO4	3	3	2	-	-	-	-	-	-	-	-	2	1	1
CO5	3	3	2	-	-	-	-	-	-	-	-	2	2	2
Avg.	3	3	2	-	-	-	-	-	-	-	-	2	1.2	1.2

1-low, 2-medium, 3-high

24ITT16	PROGRAMMING FOR PROBLEM SOLVING	Category	L	T	P	C
		ESC	3	0	0	3

(Common to AUTO, BME, CSE, CS, CSD, IOT, IT, ECE, EEE. MECH)

PREREQUISITE:

Students must have basic computer literacy, including familiarity with operating systems, file management, and software usage. A Basic understanding of algorithms and flowcharts are required to design and visualize problem-solving strategies. Students must have basic knowledge on programming principles, such as variables, simple data types, control structures, problem solving and logical thinking skills.

OBJECTIVES:

- To acquire knowledge on hardware, software and computer languages.
- To recall and implement the fundamentals concepts in C program.
- To assimilate Arrays and Functions.
- To get insight on Strings and Pointers.
- To explore the importance of Structures and Files.

UNIT - I	INTRODUCTION TO COMPUTING AND C	(9)

Introduction to Computing: Organization of computer – hardware and software – number system and conversions – representation of an algorithm: pseudo code, flowchart with examples. Introduction to C – features of C – structure of C program – character set – C tokens – keywords – identifiers – constants – variables – data types – operators – precedence and associatively.

UNIT - II	CONTROL STRUCTURES	(9)

Decision Making and Branching: Introduction – decision making with if statement – simple if statement – if-else statement – nested if-else statements – if-else-if ladder statement – switch statement – goto statement – conditional operator – decision making and looping: introduction – while statement – do-while statement – for statement.

UNIT - III	FUNCTIONS AND ARRAY	(9)

Functions: Declaration and definition – function prototype – parameter and arguments – return type – passing argument by value and by reference – function scope and lifetime – function pointer – arrays: array declaration and initialization – one dimensional array and two dimensional array with example.

UNIT - IV	POINTERS AND STRINGS	(9)

Pointers: Definition – initialization – pointers arithmetic – pointers to pointers – pointers and arrays.
String: Declaring and initializing string variables – string handling functions and operations.

UNIT - V	STRUCTURE, UNION AND FILE	(9)

Structures: Declaration – definition – structure within a structure – union – storage classes – preprocessor directives – Files: Defining and opening a file – closing a file – input/output operations on files – command line arguments.

TOTAL: 45 PERIODS

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

COs	Course Outcome	Cognitive Level
CO1	Identify and describe the fundamental components of computer systems and programming in C.	Understand
CO2	Infer the concepts of basic structures in control statements.	Understand
CO3	Imbibe the concepts of arrays and functions to effectively manage and process data in programming.	Understand
CO4	Utilize pointers to handle memory and work with strings to manage text in their programs.	Apply
CO5	Infer structures and unions to group different types of data and perform file operations to save and load data.	Apply

TEXT BOOKS:

1. Herbert Schildt, C - The Complete Reference, Tata McGraw-Hill, New Delhi, Fourth Edition, 2017.
2. Byron S Gottfried and Jitendar Kumar Chhabra, “Programming with C”, Tata McGraw Hill Publishing Company, Third Edition, 2011.

REFERENCES:

1. Yashavant Kanetkar , “Let Us C: Authentic guide to C programming language”, BPB Publication, 19th Edition, 2022.
2. Robert C. Seacord, “Effective C”, No Starch Press, 2020.
3. E Balagurusamy, “Programming In Ansi C”, McGraw Hill Education, Eigth Edition, 2019.
4. Ashok N.Kamathane, “Computer Programming”, Pearson Education, India, Third Edition, 2015.
5. https://archive.nptel.ac.in/courses/106/105/106105171/

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	3	1	–	–	–	–	–	–	–
CO2	3	2	2	3	3	1	–	–	–	–	–	–	–
CO3	2	3	2	2	3	1	–	–	–	–	–	–	–
CO4	3	3	2	3	2	1	–	–	–	–	–	–	–
CO5	3	2	2	2	3	1	–	–	–	–	–	–	–
Avg.	2.8	2.6	2	2.6	2.8	1	–	–	–	–	–	–	–

1-low, 2-medium, 3-high

24GET19	HERITAGE OF TAMILS	Category	L	T	P	C
		HSMC	1	0	0	1

(common to all branches)

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 : 15 Periods

	Course Outcomes : **At the end of the course, the students 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	Insightthinai 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

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

CO	Course Outcomes	Programme Outcomes												
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	Recognize the extensive literature of Tamil and its classical nature.	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	Apprehend the heritage of sculpture, painting and musical instruments of ancient people.	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	Review on folk and martial arts of Tamil people.	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	Insightthinai concepts, trade and victory of Chozha dynasty.	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	Realize the contribution of Tamil in Indian freedom struggle, self-esteem movement and siddha medicine.	-	-	-	-	-	3	3	-	2	-	3	-	-
	Average	-	-	-	-	-	3	**3**	-	**2**	-	**3**	-	-

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

24GET19	தமிழர் மரபு	Category	L	T	P	C
		HSMC	1	0	0	1

(அனைத்து துறைகளுக்கும் பொதுவானது)

அலகு – I	மொழி மற்றும் இலக்கியம்	(03)

இந்திய மொழிக் குடும்பங்கள் – திராவிடமொழிகள் – தமிழ் ஒரு செம்மொழி – தமிழ் செவ்விலயக்கிகியங்கள் – சங்க இலக்கியத்தின் சமயச் சார்பற்ற தன்மை – சங்க இலக்கியத்தில் பகிர்தல் அறம் – திருக்குறளில் மேலாண்மைக் கருத்துக்கள் – தமிழ்காப்பியங்கள், தமிழகத்தில் சமணபௌத்த சமயங்களின் தாக்கம் – பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் – சிற்றிலகியங்கள் தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி – தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு – II	மரபு – பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக்கலை	(03)

நடுகல் முதல் நவீன சிற்பங்கள் வரை – ஐம்பொன் சிலைகள் – பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் – தேர் செய்யும் கலை – சுடுமண்சிற்பங்கள் – நாட்டுப்புறத் தெய்வங்கள் – குமரிமுனியில் திருவள்ளுவர் சிலை – இசைக்ருவிகள் – மிருதங்கம், பறை. வீணை. யாழ். நாதஸ்வரம் – தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.

அலகு – III	நாட்டுப் புறக்கலைகள் மற்றும் வீரவிளையாட்டுக்கள்	(03)

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான்கூத்து, ஒயிலாட்டம், தோல்பாவை**க்**கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

அலகு – IV	தமிழர்களின் திணைக் கோட்பாடுகள்	(03)

தமிழகத்தின் தாவரங்களும், விலங்குகளும் – தொல்காப்பியம் மற்றும் சங்கஇலக்கியத்தில் அகம் மற்றும் புறக்கோட்பாடுகள்–தமிழர்கள் போற்றிய அறக்கோட்பாடு- சங்கக்காலத்தில் தமிழகத்தில் எழுத்தறிவும் கல்வியும் – சங்ககால நகரங்களும் துறைமுகங்களும் – 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 தமிழ்பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில் சித்த மருத்துவத்தின் பங்கு கல்வெட்டுகள் கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்கள்களின் அச்சுவரலாறு.

Total : 15 Periods

பாடம் கற்றத்தின் விளைவுகள் *:**பாடத்தை வெற்றிகரகமாக கற்று முடித்த பின்பு**, **மாணவர்களால் முடியும் விளைவுகள்***		அறிவாற்றல் நிலை
CO1	*தமிழ் மொழியின் செந்தன்மை மற்றும் இலக்கியம் குறித்த தெரிதல்*	*புரிதல்*
CO2	*தமிழர்களின் சிற்பக்கலை , ஓவியக்கலை மற்றும் இசைக்கருவிகள் குறித்த தெளிவு*	*புரிதல்*
CO3	*தமிழர்களின் நாட்டுப்புறக்கலைகள் மற்றும் வீர விளையாட்டுகள் குறித்த தெளிவு*	*புரிதல்*
CO4	*தமிழர்களின் திணைக்கோட்பாடுகள், சங்ககால வணிகம் மற்றும் சோழர்களின் வெற்றிகள் குறித்த தகவல்கள் .*	*புரிதல்*
CO5	*இந்திய தேசிய இயக்கம், சுயமரியாதை இயக்கம் மற்றும் சித்தமருத்தவம் பற்றிய புரிதல்.*	*புரிதல்*

Text Books:

1 தமிழக வரலாறு - மக்களும் பண்பாடும் - கே.கே.பிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்), உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை, **2002**

2 கணினித்தமிழ் - முனைவர் இல.சுந்தரம், விகடன் பிரசுரம், 2016.

Reference Books:

1 கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்.(தொல்லியல் துறை வெளியீடு)

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

CO	Course Outcomes	Programme Outcomes												
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	*தமிழ் மொழியின் செந்தன்மை மற்றும் இலக்கியம் குறித்த தெரிதல்*	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	*தமிழர்களின் சிற்பக்கலை , ஓவியக்கலை மற்றும் இசைக் கருவிகள் குறித்த தெளிவு*	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	*தமிழர்களின் நாட்டுப்புறக்கலைகள் மற்றும் வீரவிளையாட்டுகள் குறித்த தெளிவு*	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	*தமிழர்களின் திணைக் கோட்பாடுகள், சங்ககால வணிகம் மற்றும் சோழர்களின் வெற்றிகள் குறித்த தகவல்கள்.*	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	*இந்திய தேசிய இயக்கம், சுயமரியாதை இயக்கம் மற்றும் சித்த மருத்தவம் பற்றிய புரிதல்.*	-	-	-	-	-	3	3	-	2	-	3	-	-
	Average	-	-	-	-	-	3	3	2	-	-	3	-	-

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

24MAI19	MATRICES & CALCULUS	Category	L	T	P	C
		BSC	2	1	2	4

(Common to All Branches)

PREREQUISITE

The students must have the knowledge on the basic concepts of Matrices and its applications, differential equations, differentiation, integration, partial derivatives and vector algebra and basic computer knowledge.

OBJECTIVES:

- To understand the concepts of eigenvalues, eigenvectors and quadratic forms.
- To familiarize students how to solve the higher-order linear differential equations.
- To develop the skill on the geometric properties of curves using differential calculus.
- To equip students to analyze and optimize the functions of several variables.
- To apply vector calculus and its principles to evaluate 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 – Cauchy's and Legendre's linear 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 – Euler's theorem for homogenous functions – Taylor's series expansion - 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 solenoidal vector fields – Green's theorem in plane, Gauss divergence theorem and Stoke's theorem (Cube, Cuboid and Rectangular Paralleopiped only).

List of Exercise/Experiments(MAT LAB):

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. Establish the evolutes of curve.
7. Reckon the Taylor's series for functions of two variables.
8. Compute the maxima and minima.
9. Estimate the directional derivative, divergence and curl.
10. Determine line integral, surface integral and volume integral.

Lecture: 45 Laboratory: 30 TOTAL: 75 PERIODS

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

COs	Course Outcome	Cognitive Level
CO1	Assimilate the eigen values and eigen vectors in reduction of quadratic form into canonical form.	Apply
CO2	Solve higher-order linear differential equations with constant and variable coefficients.	Understand
CO3	Analyse the center of curvature, circle of curvature and develop the evolutes.	Understand
CO4	Expand the Taylor series and calculate the extremum value for function of several variables.	Apply
CO5	Apply the divergence and curl in vector integral theorems of vector fields.	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/111/108/1111087/
6. https://archive.nptel.ac.in/courses/111/105/111105122/

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	-	-	-	-	1	-	-
CO2	3	3	3	3	2	1	-	-	-	-	1	-	-
CO3	3	3	3	3	2	1	-	-	-	-	1	-	-
CO4	3	3	3	3	2	1	-	-	-	-	1	-	-
CO5	3	3	3	3	2	1	-	-	-	-	1	-	-
Avg.	**3**	**3**	**3**	**3**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**

1-low, 2-medium, 3-high

24CHI06	CHEMISTRY FOR ENGINEERS	Category	L	T	P	C
		BSC	3	0	2	4

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

PREREQUISITE

The students must have knowledge about basic concepts of atoms, molecules, periodical properties, chemical bonding, molecular structure, shapes of the orbitals, electro chemistry, thermodynamics, chemical kinetics, organic reactions and their applications.

OBJECTIVES:

- To gain indepth knowledge on the water treatment methods and its industrial applications.
- To acquaint the basic concepts of corrosion mechanism and its control.
- To assimilate the principles and functioning of batteries, fuel cell and solar cell.
- To get a deeper insight conversant with basic concepts and applications of polymers.
- To impart knowledge on manufacture, properties, uses of nano materials and Composites.

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 composite: 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. Determination of rate of corrosion of mild steel by weight loss method
5. Estimation of dissolved oxygen in water (Winkler's Method)
6. Conductometric titration of mixture of acids (HCl & CH_3COOH) with strong base
7. Estimation of Fe^{2+} ion by potentiometric titration
8. Estimation of HCl by p^H- Metry
9. Conductometric precipitation titration using $BaCl_2$-Na_2SO_4
10. Preparation of ZnO nanocrystal by precipitation method.

Lecture:45 Laboratory:30 TOTAL: 75 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Assess the quality of water from quality water parameters	Understand
CO2	Recognize the concept of corrosion and its control.	Understand
CO3	Make use of batteries, fuel cell and solar cell for the production of electricity.	Apply
CO4	Apply the basics concepts of polymer chemistry in designing the materials for engineering and technology.	Apply
CO5	Identify the nano materials and composites for engineering and technology.	Apply

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.

NPTEL LINKS:

1. https://nptel.ac.in/courses/113101098
2. https://nptel.ac.in/courses/113105102
3. https://archive.nptel.ac.in/courses/104/105/104105039

Mapping of COs with POs and PSOs													
COs/ POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
CO1	3	2	2	-	1	-	3	1	-	-	2	-	-
CO2	3	2	2	-	1	-	3	1	-	-	2	-	-
CO3	3	2	2	-	1	-	2	1	-	-	2	-	-
CO4	3	2	2	-	1	-	2	1	-	-	2	-	-
CO5	3	2	2	-	1	-	2	1	-	-	2	-	-
Avg.	3	2	2	-	1	-	2.4	1	-	-	2	-	-
1-low, 2-medium, 3-high													

24ITP16	PROGRAMMING FOR PROBLEM SOLVING LABORATORY	Category	L	T	P	C
		ESC	0	0	2	1

(Common to AUTO, BME, CSE, CSE(CS), CSD, CSE(IoT), IT, ECE, EEE, MECH)

PREREQUISITE:

Students must have basic knowledge on programming principles, such as variables, simple data types, control structures, problem solving and logical thinking skills.

OBJECTIVES:

- To learn the basic of MS word, Excel, Power Point presentation and MS Access.
- To articulate how to develop a program with a desired runtime execution flow.
- To develop computer programs using C basics concepts.
- To get familiarity on functions, strings and pointers.
- To acquire and apply the file manipulation

List of Experiments:

1. Prepare a Bio-data using MS Word with appropriate page, text and table formatting options and send the same to too many recipients using mail merge.
2. Prepare a mark sheet with five subjects for five students in MS Excel File using Formulas, Functions and charts.
3. i) Prepare a Power Point presentation for your organization with varying animation effects using timer.
   ii) Prepare a Student Database in MS Access, manipulate the data and generate report.
4. Programs using I/O statements and expressions.
5. Design an algorithm and flowchart with example.
6. Programs using decision-making constructs: if-else, goto, switch-case, break-continue.
7. Loops: for, while, do-while.
8. Arrays: 1D and 2D
9. Strings: operations
10. Functions: passing parameters by (value, reference), Recursion
11. Pointers and structures
12. File operations.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Interpret the basic concept of MS word, Excel, Power Point presentation and MS Access and C programming.	Apply
CO2	Develop the program using the concept of control statements.	Apply
CO3	Demonstrate the use of functions and arrays in Programming.	Apply
CO4	Apply the concepts of pointers and structures.	Apply
CO5	Develop the program using the file and string operations.	Apply

REFERENCES:

1.Jeff Szuha, “Learn C Programming”, Packt Publishing, United Kingdom, Second Edition, 2022.
2.E Balagurusamy, “Programming In Ansi C”, McGraw Hill Education, Eigth Edition, 2019.

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	3	1	–	–	–	–	–	–	–
CO2	3	3	2	3	3	1	–	–	–	–	–	–	–
CO3	3	3	2	2	3	1	–	–	–	–	–	–	–
CO4	3	3	2	3	3	1	–	–	–	–	–	–	–
CO5	3	3	2	2	3	1	–	–	–	–	–	–	–
Avg.	3	3	2	2.6	3	1	–	–	–	–	–	–	–
1-low, 2-medium, 3-high													

24MEP16	ENGINEERING GRAPHICS LABORATORY	Category	L	T	P	C
		ESC	1	0	2	2

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

PREREQUISITE

Engineering Graphics Laboratory requires a good understanding of geometry and algebra. This includes knowledge of shapes, angles, dimensions, and spatial reasoning. Knowing the conventions and standards used in engineering drawings, such as line types, symbols, and dimensions, is important. Experience with freehand sketching and understanding of drawing tools and techniques can be advantageous. The ability to visualize and interpret three-dimensional objects from two-dimensional drawings is crucial.

OBJECTIVES:

- To study the drawing tools, commands and draw the two dimensional drawings in the CAD software.
- To perceive the orthographic views and draw the projections in the CAD software.
- To acquire the knowledge to observe the sectional views and develop the lateral surfaces of the simple solids.
- To sketch the isometric projections of simple solids.
- To avail the drafts of the 3D models using drafting tools.

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.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Recall the drawing tools and commands and produce two dimensional objects in CAD software.	Remember
CO2	Obtain the orthographic views using CAD software.	Understand
CO3	Attain sectional views and develop the lateral surfaces of simple solids.	Understand
CO4	Portray the isometric projection of simple solids.	Understand
CO5	Acquire drafts of 3D model.	Apply

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**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
CO1	3	-	-	-	3	-	-	-	-	2	-	1	-	-
CO2	3	-	-	-	3	-	-	-	-	2	-	1	-	-
CO3	3	-	-	-	3	-	-	-	-	2	-	1	-	-
CO4	3	-	-	-	3	-	-	-	-	2	-	1	-	-
CO5	3	-	-	-	3	-	-	-	-	2	-	1	-	-
Avg.	3	-	-	-	3	-	-	-	-	2	-	1	-	-
1-low, 2-medium, 3-high														

24GEP16	ENGINEERING EXPERIENCELABORATORY	Category	L	T	P	C
		ESC	0	0	2	1

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

PREREQUISITE:

Students must have a basic knowledge of electrical components like switches, wires, fuses, and light bulbs along with different wire types and their purposes. A basic understanding of engineering principles, such as physics, electrical and mechanical engineering, is also essential.

OBJECTIVES:

- To gain practical experience in wiring circuits, including the installation of switches, outlets, lighting fixtures, and other electrical components.
- To acquire the relationship between voltage, current, power, and energy in single-phase systems.
- To demonstrate the application of Internet of Things (IoT) concepts by integrating sensors, actuators, and communication modules to create connected systems and devices.
- To explicate the function and operation of different types of sensors and how they interface with the Arduino to collect and process data for controlling circuits.
- To acquire the fundamental components and functions of plumbing systems, including pipes, valves, fittings, and fixtures, and how they are integrated into engineering practices and applications.

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	Cognitive Level
CO1	Construct different types of wiring used in residential houses.	Apply
CO2	Measure the energy in a 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

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	3	3	-	-	2	3	2	-	3	-	-
CO4	3	3	3	3	-	-	2	3	2	-	3	-	-
CO5	3	3	3	-	-	-	2	3	2	-	3	-	-
Avg.	**3**	**3**	**2.6**	**3**	**-**	**2**	**2**	**3**	**2**	**-**	**3**	**-**	**-**

1 - Low, 2 - Medium, 3 - High

24SSP19	APTITUDE AND CODING SKILL – I	Category	L	T	P	C
		EEC	0	0	2	1

(Common to All Branches)

OBJECTIVES:

The Course will enable learners to:

- To introduce the students about Aptitude
- To expose to the Needs of Aptitude and its importance
- To develop proficiency in verbal reasoning for improved problem-solving ideas.
- To develop a strong foundation in English grammar.
- To introduce advanced topics including pointers, user-defined data types, and memory management.

UNIT - I	BASIC OF NUMBER SYSTEMS & FOUNDATION	(6)

Introduction to Number System and its Classification - Divisibility Rules and Problems –Place Value & Face Value - HCF & LCM and its properties.

UNIT - II	BASICS OF SHARE BASED CONCEPTS	(6)

Introduction to Average –Basics of Ratio and proportion – Basics of Partnership–Introduction to Percentage

UNIT - III	LOGICAL REASONING	(4)

Analogies - Alpha and numeric series - Number Series - Coding and Decoding - Direction and distance

UNIT - IV	VERBAL ABILITY	(7)

Introduction to Grammar – Tenses – Parts of Speech – Preposition – Articles – Modal Verbs

UNIT - V	C PROGRAMMING	(7)

C Basics-Control Statements Decision making – Functions – Arrays & Strings – Pointers - User Defined Data Types - Storage Classes - Memory Management - Preprocessor.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Develop problem-solving skills and identify optimal solutions efficiently.	Understanding
CO2	Solve problems on quantitative aptitude	Applying
CO3	Resolve problems with logical reasoning	Applying
CO4	Develop proficiency in verbal and communication for improved and effective articulation of ideas.	Applying
CO5	Implement C coding with appropriate data structures and pointers.	Applying

TEXT BOOKS:

1. R S Aggarwal, Quantitative Aptitude for Competitive Examinations.
2. R.S. Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning
3. Wren & Martin, High School English Grammar & Composition
4. Brian W. Kernighan and Dennis Ritchie, The C Programming Language 2e, Pearson Education, 2015.
5. Yashavant Kanetkar, The C Programming Language 2e, BPB publications,15th Edition, 2016

REFERENCES:

1. https://www.geeksforgeeks.org/quantitative-aptitude/?ref=shm
2. Stephen G. Kochana, Programming in C, 3rd Edition.
3. K. N. King, C Programming: A Modern Approach, 2e, 2008.
4. Aaron M. Tenenbaum, Yedidyah Langsam, and Moshe J. Augenstein, Data Structures Using C, Pearson Education India, 1990.
5. Robert L. Kruse and Bruce P. Leung, Data Structures and Program Design in C, Pearson Education 2007.
6. https://www.geeksforgeeks.org/c-programming-language/
7. https://www.geeksforgeeks.org/data-structures/

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	3	-	3	1	-	3	-	-
CO2	3	3	3	-	3	3	-	3	1	-	3	-	-
CO3	3	3	3	-	3	3	-	3	3	-	3	-	-
CO4	-	-	-	-	3	3	-	3	3	-	3	-	-
CO5	3	3	3	-	3	3	-	3	2	-	3	-	-
Avg.	**2.4**	**2.4**	**2.4**	**-**	**3**	**3**	**-**	**3**	**2**	**-**	**3**	**-**	**-**

24CST29	PYTHON PROGRAMMING	Category	L	T	P	C
		PCC	3	0	0	3

(Common to All Branches)

PREREQUISITE:

A basic understanding of programming principles such as variables and loops, paired with good problem-solving abilities, is required. Logical thinking and analytical skills are critical for effective programming.

OBJECTIVES:

- To introduce the fundamental concepts of Python programming, including variables, control structures and functions.
- To teach string manipulation, data structures, and exception handling in Python.
- To establish a solid understanding of object-oriented programming in Python, covering inheritance, polymorphism, and operator overloading.
- To enable students to perform file operations and manage databases using Python.
- To introduce web programming and GUI development in Python using Django and Tkinter frameworks.

UNIT – I	FUNDAMENTALS OF PYTHON	(9)

Introduction to Python – Advantages of Python programming – Variables and Data types – Comments – Indentation– I/O function –Operators – Selection control structures – Looping control structures – Functions: Declaration – Types of arguments – Anonymous functions: Lambda.

UNIT – II	HANDLING STRINGS AND EXCEPTIONS	(9)

Strings – List – Tuples – Dictionaries– Sets – Exception Handling: Built-in Exceptions – User-defined exception– Modules and Packages.

UNIT – III	OBJECT ORIENTED PROGRAMMING CONCEPTS	(9)

Object Oriented Programming basics –Inheritance and Polymorphism – Operator Overloading and Overriding – Get and Set Attribute Values – Name Mangling –Duck Typing – Relationships.

UNIT–IV	FILES AND DATA BASES	(9)

File I/O operations – Directory Operations – Reading and Writing in Structured Files: CSV and JSON – Data manipulation using MySQL.

UNIT – V	WEBPROGRAMINGAND GUI USING PYTHON	(9)

Frameworks: Introduction to Django – Django CRUD– Socket Programming– Sending email –UI design: Tkinter – Events– CGI: Introduction to CGI Programming, GET and POST Methods.

TOTAL: 45 PERIODS

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

COs	Course Outcome	Cognitive Level
CO1	Infer Python syntax to write code, using data types, operators, loops and conditionals.	Understand
CO2	Interpret string manipulation, data structures and exception handling to build robust applications.	Understand
CO3	Implement object-oriented programming principles, such as inheritance and polymorphism, to design effective solutions.	Apply
CO4	Make use of file I/O operations and database management techniques to manage and manipulate data efficiently.	Apply
CO5	Develop web applications and graphical user interfaces using Python frameworks and libraries	Apply

TEXT BOOKS:

1. YashwantKanetkar, Aditya Kanetkar, "Let Us Python", BPB Publications, 5th Edition ,2023
2. Wesley J.Chun, "Core Python Programming", Pearson Education, 2nd Edition, 2017

REFERENCES:

1. Robert Oliver, "Python Quick Start Guide: The Simplified Beginner's Guide to Python Programming Using Hands-On Projects and Real-World Applications", Clyde Bank Media LLC,1st Edition, 2023
2. Allen B. Downey, "Think Python", O'Reilly Media, 2nd Edition, 2016.
3. David Beazley, Brian K. Jones, "Python Cookbook", O'Reilly Media, 3rd Edition, 2013
4. Mark Lutz, "Python Pocket Reference", O'Reilly Media,5th Edition, 2014
5. www.python.org
6. https://onlinecourses.swayam2.ac.in/cec22_cs20/preview

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	1	-	-	1	-	-	3	-	-
CO2	3	3	3	2	2	-	-	1	-	-	3	-	-
CO3	3	3	3	2	2	-	-	1	-	-	3	-	-
CO4	3	3	3	3	2	-	-	1	-	-	2	-	-
CO5	3	3	3	3	2	-	-	1	-	-	2	-	-
Avg.	**3**	**3**	**2.8**	**2**	**1.8**	-	-	**1**	-	-	**2.6**	**-**	**-**

1-low, 2-medium, 3-high

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

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

- Learn Design Thinking concepts and principles
- Understand the importance of the Design Mind
- Use Design Thinking methods in every stage of problem solving
- Learn the different phases of Design Thinking
- Learn and apply various Design Thinking tools

UNIT - I	FUNDAMENTALS OF DESIGN THINKING	(6)

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

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

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

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

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

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

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

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

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

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Demonstrate an understanding of Design Thinking concepts and principles by explaining their relevance in real-world contexts.	Understanding
CO2	Articulate the significance of a Design Mindset and its impact on creative problem-solving.	Understanding
CO3	Apply Design Thinking methods effectively at each stage of the problem-solving process.	Applying
CO4	Identify and implement the phases of Design Thinking to address complex challenges systematically.	Applying
CO5	Use a variety of Design Thinking tools to develop innovative solutions and refine ideas through iteration.	Applying

TEXT BOOKS:

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

REFERENCES:

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

Mapping of COs with POs and PSOs

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	2	2	2	2	3	2	3	3	-	-
CO2	3	3	2	2	2	2	2	3	2	3	3	-	-
CO3	3	3	3	3	3	2	2	3	2	3	3	-	-
CO4	3	3	3	3	3	2	2	3	2	3	3	-	-
CO5	3	3	3	3	3	2	2	3	2	3	3	-	-
Avg.	**3**	**3**	**2.6**	**2.6**	**2.6**	**2**	**2**	**3**	**2**	**3**	**3**	**-**	**-**

1-low, 2-medium, 3-high

24GET29	TAMILS AND TECHNOLOGY	Category	L	T	P	C
		HSMC	1	0	0	1

(Common to All Branches)

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 : 15 Periods

	COURSE OUTCOMES : **At the end of the course, the students 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

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

CO	Course Outcomes	Programme Outcomes												
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	Understand the weaving and ceramic technology of ancient TamilPeople nature.	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	Comprehend the construction technology, building materials in sangamPeriod and case studies.	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	Infer the metal process, coin and beads manufacturing with relevantarcheological evidence	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	Realize the agriculture methods, irrigation technology and pearl diving.	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	Apply the knowledge of scientific Tamil and Tamil computing.	-	-	-	-	-	3	3	-	2	-	3	-	-
	Average	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**2**	**-**	**3**	**-**	**-**

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

24GET29	தமிழரும் தொழில் நுட்பமும்	Category	L	T	P	C
		HSMC	1	0	0	1

(அனைத்து துறைகளுக்கும் பொதுவானது)

அலகு – I	**நெசவு மற்றும் பானைத் தொழில்நுட்பம்**	**(03)**

சங்க காலத்தில் நெசவுத் தொழில் – பானைத் தொழில் நுட்பம் கருப்பு சிவப்பு பாண்டங்கள்– பாண்டகளில் கீறல் குறியீடுகள்

அலகு – II	**வடிவமைப்பு மற்றும் கட்டிடத் தொழில் நுட்பம்**	**(03)**

சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்ககாலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு – சங்ககாலத்தில் கட்டுமானப் பொருட்களும் நடுகல்லும்– சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் – மாமல்லபுரச் சிற்பங்களும், கோவில்களும்–சோழர் காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத்தலங்கள் – நாயக்கர் காலக் கோயில்கள்–மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் – செட்டி நாட்டு வீடுகள் – பிரிட்டிஷ் காலத்தில் சென்னை இந்தோ-சாரோ செனிக் கட்டிடக் கலை.

அலகு – III	**உற்பத்தித் தொழில் நுட்பம்**	**(03)**

கப்பல் கட்டும் கலை – உலோகவியல் – இரும்புத் தொழிற்சாலை – இரும்பை உருக்குதல், எஃகு–வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் – நாணயங்கள் அச்சடித்தல்–மணி உருவாக்கும் தொழிற்சாலைகள் – கல்மணிகள் – கண்ணாடி மணிகள் – சுடு மண்மணிகள்–சங்குமணிகள் – எலும்புத் துண்டுகள் – தொல்லியல் சான்றுகள் –சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

அலகு – IV	**வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம்**	**(03)**

அணை, ஏரி, குளங்கள், மதகு – சோழர் கால குமிழித்தூம்பின் முக்கியத்துவம்–கால் நடைபராமரிப்பு – கால் நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள்–வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள் – கடல் சார் அறிவு – மீன்வளம் – முத்து மற்றும் முத்துக்குளித்தல் – பெருங்கடல் குறித்த பண்டைய அறிவு – அறிவுசார் சமூகம்.

அலகு – V	**அறிவியல் தமிழ் மற்றும்** கணினித்தமிழ்	**(03)**

அறிவியல் தமிழின் வளர்ச்சி – கணினித் தமிழ் வளர்ச்சி – தமிழ் நூல்களை மின் பதிப்பு செய்தல் –தமிழ் மென் பொருட்கள் உருவாக்கம் – தமிழ் இணையக் கல்விக் கழகம் – தமிழ் மின் நூலகம்–இணையத்தில் தமிழ் அகராதிகள் சொற்குவைத் திட்டம்.

Total : 15 Periods

பாடம் கற்றத்தின் விளைவுகள் : பாடத்தை வெற்றிகரமாக கற்று முடித்த பின்பு, மாணவர்களால் முடியும் விளைவுகள்		அறிவாற்றல் நிலை
CO1	*சங்ககாலத் தமிழிர்களின் நெசவு மற்றும் பானை வனைதல் தொழில் நுட்பம் குறித்து கற்றுணர்தல்*	*புரிதல்*
CO2	*சங்ககாலத் தமிழிர்களின் கட்டிட தொழில்நுட்பம் 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 கன்னித்தமிழ் குறித்த புரிந்து கொள்ளலும் மற்றும் பயன்படுத்தலும்*	*பகுப்பாய்வு*

Text Books :

1. தமிழக வரலாறு- மக்களும் பண்பாடும்- கே.கே.பிள்ளை (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 Tamil Nadu (Dr.K.K.Pillay) (Published by : The Author)
4. Porunai Civilization (Jointly Published by: Department of Archaeology &Tamil Nadu Textbook and Educational Services Corporation, Tamil Nadu)

Mapping of COs with POs and PSOs

CO	Course Outcomes	Programme Outcomes												
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	*சங்ககாலத் தமிழிர்களின் நெசவு மற்றும் பானை வனைதல் தொழில் நுட்பம் குறித்து கற்றுணர்தல்*	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	*சங்ககாலத் தமிழிர்களின் கட்டிட தொழில் நுட்பம் கட்டுமான பொருட்கள் மற்றும் அவற்றை விளகும் தளங்கள் குறித்து அறிவு*	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	*சங்ககாலத் தமிழிர்களின் உலோகத் தொழில், நாணயங்கள் மற்றும் மணிகள் சார்ந்த தொல்லியல் சான்றுகள் பற்றிய அறிவு*	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	*சங்ககாலத் தமிழிர்களின் வேளாண்மை, நீர்ப்பாசன முறைகள் மற்றும் முத்து குளித்தல் குறித்த தெளிவு*	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	*நவீன அறிவியல் தமிழ் மற்றும் கன்னிதமிழ் குறித்த புரிந்து கொள்ளலும் மற்றும் பயன்படுத்தலும்*	-	-	-	-	-	3	3	-	2	-	3	-	-
	Average	-	-	-	-	-	-	**3**	**3**	-	**2**	-	-	-

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

24MAI29	PROBABILITY AND STATISTICS	Category	L	T	P	C
		BSC	2	1	2	4

(Common to All Branches)

PREREQUISITE:

The students should know the fundamental knowledge on probability, integration, measures of central tendency and dispersion, graphical representation of given data and basic computer knowledge.

OBJECTIVES:

- To understand the basic concepts of probability and random variables.
- To provide the skills on the two dimensional random variables in solving engineering problems.
- To develop the skills of testing of hypothesis for small and large samples.
- To introduce the basic concepts of classifications of design of experiments.
- To acquire the knowledge on statistical quality control.

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 – Acceptance sampling for construction of an OC curve.

List of Exercise/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. Calculate and plot the regression lines.
5. Test the significance of difference between experimental and theoretical values of the data by using chi-square test.
6. Examine the small samples using F distribution.
7. Analyze the data using Randomized Block Design (RBD).
8. Inspect the data using Latin Square Design (LSD).
9. Find the $\bar{X}$ and R charts.
10. Compute c and p charts.

Lecture:45 Laboratory:30 TOTAL: 75 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Illustrate the fundamental concepts of probability and standard distributions in real life phenomenon.	Understand
CO2	Solve engineering problems by applying the concepts of two-dimensional random variables.	Understand
CO3	Apply the concept of testing of hypothesis for small and large samples in mean and variance.	Apply
CO4	Analyze the various statistical methods in Analysis of Variance.	Analyze
CO5	Apply the quality control methods to design control charts.	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	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	3	3	2	-	-	-	1	-	1	-	-
CO2	3	3	3	3	2	-	-	-	1	-	1	-	-
CO3	3	3	3	3	2	-	-	-	1	-	1	-	-
CO4	3	3	3	3	2	-	-	-	1	-	1	-	-
CO5	3	3	3	3	2	-	-	-	1	-	1	-	-
Avg.	**3**	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**

1-low, 2-medium, 3-high

24PHI07	ENGINEERING PHYSICS	Category	L	T	P	C
		BSC	3	0	2	4

(Common to BME, CSE, CSD, 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 and semiconducting materials, different types of magnetic materials, super conducting materials and their applications.

OBJECTIVES:

- To enrich with widen knowledge on laser and fibre technology.
- To explore the basic concepts of quantum mechanics.
- To emphasis the properties of conducting materials.
- To comprehend the fundamental concepts of semiconducting material to impart it for device fabrication.
- To formalize the different types of magnetic material and its applications in the field of engineering.

UNIT – I	LASER AND FIBRE OPTICS	(9)

Lasers: Principles of spontaneous emission and stimulated emission - Einstein's co-efficients A & B– population inversion – molecular beam laser (CO2) –homo – junction & hetero – junction semiconductor lasers (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 – Jeans' Law from Planck's theory, Compton effect– de-Broglie's 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 – Fermi level of extrinsic semiconductors– variation of Fermi energy level with temperature in an extrinsic semiconductor– 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. By forming interference fringes, determine the width of one fringe and hence calculate the thickness of the given thin paper.
2. For a given optical fibre determine the acceptance angle and numerical aperture.
3. Evaluate the wave length of semiconductor laser.
4. Using semiconductor laser find the particle size of the lycopodium powder
5. Construct Carey Foster's bridge to measure the resistivity of an unknown wire.
6. Enumerate the thermal conductivity of a bad conductor by Lee's disc method.
7. Compute the band gap of an intrinsic semiconductor.
8. Draw the V-I characteristics of a solar cell and calculate its power.
9. By forming B-H curve calculate Hysteresis loss of magnetic materials.
10. Employing semiconductor laser compute the width of the groove of CD.

Lecture: 45 Laboratory:30 TOTAL: 75 PERIODS

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

COs	Course Outcome	Cognitive level
CO1	Categorize the types of laser and optical fibre to utilize it for specific application based on their desirable requisite.	Analyze
CO2	Enumerate the preambles of quantum mechanics and implement its concepts to tackle the cumbersome engineering problems.	Apply
CO3	Comprehend the basics of conducting materials based on classical and quantum theories.	Understand
CO4	Apply the perceived preambles of semiconductor to fabricate it for the potential applications	Analyze
CO5	Imbibe the concepts of magnetic and superconducting phenomenon that can be applied for possible technological and engineering applications.	Apply

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. V. Rajendran, "Engineering Physics", Tata McGraw-Hill, New Delhi, 1st edition, 2011.
2. R. Murugeshan and Kiruthiga Sivaprasath,"Modern Physics", S. Chand & Company, New Delhi, 7th Edition, 2014.
3. Charles Kittel, "Introduction to Solid State Physics", John Wiley & Sons, India, 7th Edition, 2008.
4. ArthurBeiser, 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	PSO1	PSO2
CO1	3	2	-	-	2	-	1	-	2	-	2	-	-
CO2	3	2	-	-	2	-	1	-	2	-	2	-	-
CO3	3	2	-	-	2	-	-	-	2	-	2	-	-
CO4	3	2	-	-	2	-	1	-	2	-	2	-	-
CO5	3	2	-	-	2	-	1	-	2	-	2	-	-
Avg.	3	2	-	-	2	-	1	-	2	-	2	-	-

1-low, 2-medium, 3-high

24ECI26	DIGITAL PRINCIPLES AND SYSTEM DESIGN	Category	L	T	P	C
		HSMC	3	0	2	4

(Common to CSE, CSD, CSE(IoT), CS & IT)

PREREQUISITE:

Students should have a basic understanding of electrical circuits, introductory programming knowledge and familiarity with digital electronics, particularly binary numbers and logic gates. Additionally, students should have a solid foundation in algebra and discrete mathematics, with an emphasis on Boolean algebra.

OBJECTIVES:

- To equip students with the ability to apply Boolean theorems and techniques and simplification of Boolean functions using Karnaugh Map and Tabulation method.
- To develop the analytical and design skills necessary for creating combinational logic circuits, including components like adders, subtractors, and multiplexers.
- To provide insights on the design and analysis of synchronous sequential circuits, emphasizing the use of latches, flip-flops, shift registers, and counters.
- To make the students to design arithmetic and logic circuits.
- To foster the capability to design simple computer architectures and implement these designs using Hardware Description Language (HDL) for both combinational and sequential logic circuits.

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 Conversions – 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:
   b) 4 - bit binary adder / subtractor
   c) Parity generator / checker
   d) Multiplexers and De-Multiplexers
4. Design and implementation of sequential circuits:
   a) Shift-registers
   b) Synchronous counter
5. HDL Models for coding combinational / sequential circuits.

TOTAL = 75 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	CognitiveLevel
CO1	Apply Boolean theorems and techniques, Karnaugh Map and Tabulation method for simplifying Boolean functions.	Apply
CO2	Develop skills to design and analyze combinational logic circuits, including adders, subtractors, and multiplexers.	Apply
CO3	Design synchronous sequential circuits using latches, flip-flops.	Apply
CO4	Design processors which include arithmetic and logic circuits.	Apply
CO5	Design simple computer architectures and implement them using HDL for both combinational and sequential logic circuits.	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.

Reference Books :

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

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	-	-	-	-
Avg.	**2**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**3**	**-**	**-**	**-**	**-**

24ENP29	PROFESSIONAL COMMUNICATION LABORATORY	Category	L	T	P	C
		HSMC	0	0	2	1

(Common to All Branches)

PREREQUISITE:

Students having prior knowledge from the Professional Communication course with a solid base of LSRW skills are the prerequisites for the course.

OBJECTIVES:

- To provide self-paced learning to consolidate their understanding of advanced grammar and vocabulary Methods
- To equip the students with the required LSRW skills to handle advanced communication situations in English
- To make learners to speak in simple sentences without any hesitation
- To facilitate learners to draft basic formal written communication
- To provide audio and video support to ensure meaningful skill acquisition

UNIT - I	GRAMMAR	(6)

Types of Sentences – Tenses & Voice- Concord – Auxiliary-Infinitive – Article-preposition – Comparative and Superlative adjective. Discourse Markers –Linkers: sequential – past time (later) Connecting words expressing cause and effect, contrast. Markers to structure informal spoken discourse Verb forms WH- and Yes/No Questions in present / past Complex question tags Broader range of intensifiers; So, such, too, enough, connecting words expressing cause and effect, contrast.

UNIT – II	LISTENING	(6)

Short conversations / monologues: numbers and spelling (dates, prices, percentages, figures, etc.) and locate specific information, longer monologue and note taking – gap filling, Understanding the gist and extracting main idea. Conversation between two employees – Description of gadgets – Enquiring about orders and deliveries – Chasing an order: Telephone Conversations – Radio Interview – Voicemail messages and phone conversations – Welcome speech at a conference – Statistical information.

UNIT – III	SPEAKING	(6)

Talking about oneself, agreeing and disagreeing, expressing preferences-mini-presentation on a business theme (Oral) - Giving information and expressing opinions- discussion on business-related topics - Helping students in achieving clarity and fluency; manipulating paralinguistic features of speaking (voice modulation, pitch, tone stress, effective pauses) Conducting Task oriented interpersonal, informal and semiformal Speaking / Classroom Presentation - Teaching strategies for Group Discussion - Teaching Cohesion and Coherence - Teaching effective communication & strategies for handling criticism and adverse remarks - Teaching strategies of Turn- taking, effective intervention, and courtesies, Role Play, Mock & HR Interview.

UNIT - IV	READING	(6)

Short texts and understand the main message (signs, messages, postcards, notes, emails, labels) – Read and find specific information- Interpreting visual information-Comprehend detailed factual information—gather the gist- understand grammar and structure of the given passage- transferring information – Radio Commentary, Technical Texts and Case Studies – Guiding students for Intensive & Extensive Reading – Reading notices, messages, adverts, leaflets, contents pages, graphs, charts, tables, business letters, product descriptions, reports, minutes, newspaper or magazine articles, memos.

UNIT – V	WRITING	(6)

Internal written communication - short messages to colleagues - note, message, memo, email- External communication - letter, email, notice-set phrases for letters and e-mails-Cohesive devices - All varieties of Technical Report, Business Letters and Job Application - Punctuation & Spelling, Semantics of Connectives, Modifiers and Modals, variety of sentences and paragraphs - Organizational Communication: Memo, Notice, Circular, Agenda / Minutes

TOTAL = 30 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Understand and apply the basic grammar and learn the range of vocabulary	Understand
CO2	Listen enthusiastically and consolidate the messages and information of monologues and dialogues	Remember
CO3	Convey the views and opinions clearly in simple sentences	Apply
CO4	Read and comprehend the statistics and texts with clear understanding	Analyse
CO5	Write the contexts relevant to the topics efficiently.	Understand

TEXT BOOKS:

1. Whitby Norman, Business Benchmark Pre-Intermediate to Intermediate Student's Book CUP Publications, 3rd Edition, 2018
2. Wood Ian, Williams Anne, Cowper Anna, Pass BEC Preliminary, Cengage Learning, 2nEdition, 2015.

REFERENCES:

1. BEC Preliminary – Cambridge Handbook for Language Teachers, 2nd Edition, CUP 2000.
2. Hewings Martin – Advanced grammar in use- Upper-Intermediate Proficiency, CUP, 3rEdition, 2013.

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	-	-	-	-
Avg.	**2**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**3**	**-**	**-**	**-**	**-**

24CSP29	PYTHON PROGRAMMING LABORATORY	Category	L	T	P	C
		PCC	0	0	2	1

(Common to All Branches)

PREREQUISITE:

Students must have basic knowledge on programming principles, such as variables, simple data types, control structures, problem solving and logical thinking skills.

OBJECTIVES:

- To perform operations like reversing, palindrome checking, and character replacement.
- To utilize functions for computing mathematical calculations and solve specific problems.
- To impart knowledge on conditionals and loops to address various problem-solving scenarios.
- To explore sets and dictionaries for sorting, searching, and removing duplicates in data.
- To acquire knowledge in polymorphism, exception handling, GUI design, and web development.

List of Exercise/Experiments:

1. Implementing programs using Strings. (reverse, palindrome, character count, replacing characters)
2. Implementing programs using Functions (GCD of two numbers, Factorial)
3. Scientific problems using conditional statements and loops. (Largest among three numbers, Number series, Number Patterns)
4. Implementing real-time applications using Sets, Dictionaries (Sorting, Searching, Remove Duplicates)
5. Implementing real-time/technical applications using Lists, Tuples. (Swapping two elements, Reversing a List / Sorting Tuples)
6. Create a Python program to demonstrate polymorphism with inheritance. (Single, Multilevel Inheritance, Hierarchical)
7. Implement a simple calendar in python program without using the calendar module using string array or list.
8. Write a program to demonstrate the user-defined exception handling mechanism in Python.
9. Design and implement a graphical user interface to perform any arithmetic operation.
10. Implementing a web application with MySQL database integration for CRUD operations (Flask / Django Framework)

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Design simple programs using conditional statements and loops.	Apply
CO2	Demonstrate the functions to perform mathematical calculations and solve specific problems.	Apply
CO3	Apply conditional and looping statements to solve problems.	Apply
CO4	Apply sets and dictionaries for sorting, searching, and removing duplicates.	Apply
CO5	Implement polymorphism, manage exceptions, develop GUIs, and build web applications with MySQL.	Apply

REFERENCES:

1. Yashwant Kanetkar, Aditya Kanetkar, "Let Us Python", BPB Publications, 5th Edition, 2023.
2. Wesley J.Chun, "Core Python Programming", Pearson Education, 2nd Edition, 2017.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	3	3	2	2	2	-	-	1	-	-	1	-	-
CO2	3	3	3	2	2	3	-	-	1	-	-	1	-	-
CO3	3	3	3	2	2	3	-	-	1	-	-	1	-	-
CO4	3	3	3	1	3	3	-	-	1	-	-	1	-	-
CO5	3	3	3	1	3	3	-	-	1	-	-	1	-	-
Avg.	**2.8**	**3**	**3**	**1.6**	**2.4**	**2.8**	**-**	**-**	**1**	**-**	**-**	**1**	**-**	**-**

1-low, 2-medium, 3-high

24SSP29	APTITUDE AND CODING SKILL –II	Category	L	T	P	C
		EEC	0	0	2	1

(Common to All Branches)

OBJECTIVES:

The Course will enable the learners:

- To expose to various concept of Aptitude problem solving
- To solve the problem and to improve analytical skill based on company specific skill
- To develop proficiency in verbal reasoning for improved critical thinking.
- To build and enrich the communication skills
- To Apply fundamental Python programming concepts, including variables, data types, control structures, and functions, to solve basic computational problems effectively

UNIT - I	NUMBERS AND SHARE BASED CONCEPTS	(6)

Problems on Numbers – Unit Digits – Squares and Cubes – Remainder Theorem – Averages – Ratio Proportions and Partnership – Percentage – Profit and Loss

UNIT - II	BASICS OF WORK BASED CONCEPTS	(6)

Introduction to time and work –Introduction to Time, Speed and Distance, Problems on Trains

UNIT - III	LOGICAL REASONING	(4)

Blood Relations – Ranking and Ordering – Inequalities – Cause and Effect

UNIT - IV	VERBAL ABILITY	(7)

Yes or No and "WH" Questions – Conjunctions – Count / Uncounted Nouns – Direct and Indirect Speech – Active and Passive Voice

UNIT - V	PYTHON PROGRAMMING FUNDAMENTALS	(7)

Introduction-Features-Environment setup; Basic syntax: variable-data types-operators-control statements-if- if-else- loop-break-continue, etc. List- operations on list; String operations- access; Tuple: operations on tuple; Dictionaries: Accessing dictionaries, working with dictionaries; Functions-Exception Handling-Input & Output-Modules-OOPs concepts-Numerical Programming.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Develop problem-solving skills and identify optimal solutions efficiently.	Understanding
CO2	Solve problems on quantitative aptitude	Applying
CO3	Resolve problems with logical reasoning	Applying
CO4	Develop proficiency in verbal and communication for improved and effective articulation of ideas.	Applying
CO5	Implement Python coding by utilizing appropriate data structures.	Applying

TEXT BOOKS:

1. R S Aggarwal, Quantitative Aptitude for Competitive Examinations.
2. R.S. Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning.
3. Wren & Martin, High School English Grammar & Composition
4. Allen B. Downey, Think Python: How to Think like a Computer Scientist, 2nd Edition, O'Reilly Publishers, 2016
5. Karl Beecher, Computational Thinking: A Beginner's Guide to Problem Solving and Programming, 1st Edition, BCS Learning & Development Limited, 2017.

REFERENCES:

1. Paul Deitel and Harvey Deitel, Python for Programmers, Pearson Education, 1st Edition, 2021.
2. Martin C. Brown, Python: The Complete Reference, 4th Edition, Mc-Graw Hill, 2018.
3. https://www.python.org/

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	3	-	3	1	-	3	-	-
CO2	3	3	3	-	3	3	-	3	1	-	3	-	-
CO3	3	3	3	-	3	3	-	3	3	-	3	-	-
CO4	-	-	-	-	3	3	-	3	3	-	3	-	-
CO5	3	3	3	-	3	3	-	3	2	-	3	-	-
Avg.	**2.4**	**2.4**	**2.4**	**-**	**3**	**3**	**-**	**3**	**2**	**-**	**3**	**-**	**-**