KSR College of Engineering

NAAC ACCREDITED A++ | NBA ACCREDITED PROGRAMMES

AN AUTONOMOUS INSTITUTION

B.E. - MECHANICAL ENGINEERING

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 MECHANICAL ENIGNEERING

(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 mutually beneficial partnership with global industries and Institutions through knowledge sharing, collaborative research and innovation.

Vision of the Department / Programme: (Mechanical Engineering)

DV	To be a centre of excellence in the field of Mechanical Engineering for providing its students and faculty with opportunities for excel in education and targeted research themes in emerging areas.

Mission of the Department / Programme: (Mechanical Engineering)

DM 1	To excel in academic and research activities that meet the industrial and social needs.
DM 2	To develop competent, innovative and ethical mechanical Engineers.

Programme Educational Objectives (PEOs) : (Mechanical Engineering)

The graduates of the programme will be able to

PEO 1	**Successful career:** Identify, design and apply the technical skills to solve mechanical engineering problems for enhancing the quality of life.
PEO 2	**Lifelong Learning:** Apply the modern tools and techniques to face the challenges in mechanical and related engineering areas.
PEO 3	**Service to society:** Understand the responsibility, communicate and implement innovative ideas in multidisciplinary teams ethically for uplifting the society.

PROGRAMME OUTCOMES (POs) AND PROGRAMME SPECIFIC OUTCOMES (PSOs)

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

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

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	24MET16	Engineering Drawing	PCC	2	0	4	6	**4**	40	60	100
3	24ITT16	Programming for Problem Solving	ESC	3	0	0	3	**3**	40	60	100
4	24GET19	தமிழர் 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	24PHI06	Applied Physics	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	24GEP17	Manufacturing Practices Laboratory	ESC	0	0	2	2	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE											
9	24SSP19	Aptitude and Coding Skills-I	EEC	0	0	2	2	**1**	60	40	100
MANDATORY COURSE											
10		Mandatory Course – I	MC	0	0	2	2	**0**	-	-	-
			TOTAL	14	1	16	31	**22**	**900**		

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

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	ESC	3	0	0	3	**3**	40	60	100
2	24MET26	Design Thinking	PCC	2	0	0	2	**2**	40	60	100
3	24EET06	Basics of Electrical and Electronics Engineering	ESC	3	0	0	3	**3**	40	60	100
4	24GET29	தமிழரும் தொழில் நுட்பமும் / Tamils and Technology	HSMC	1	0	0	1	**1**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT											
5	24MAI29	Probability and Statistics	BSC	2	1	2	5	**4**	50	50	100
6	24CHI07	Applied Chemistry	BSC	3	0	2	5	**4**	50	50	100
LABORATORY COURSES											
7	24ENP29	Professional Communication Laboratory	HSMC	0	0	2	2	**1**	60	40	100
8	24CSP29	Python Programming Laboratory	ESC	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
			TOTAL	14	1	10	25	**20**	**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	24MAT36	Transforms and Complex Variables	BSC	3	1	0	4	**4**	40	60	100
2	24MET31	Engineering Thermodynamics	PCC	3	1	0	4	**4**	40	60	100
3	24MET32	Manufacturing Technology -I	PCC	3	0	0	3	**3**	40	60	100
4	24MET33	Engineering Materials and Metallurgy	PCC	3	0	0	3	**3**	40	60	100
5	24MET36	Engineering Mechanics	PCC	3	1	0	4	**4**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT											
6	24MEI36	Fluid Mechanics and Machinery	PCC	3	0	2	5	**4**	50	50	100
LABORATORY COURSES											
7	24MEP31	Manufacturing Technology Laboratory	PCC	0	0	2	2	**1**	60	40	100
8	24MEP32	Design Studio-I	PCC	0	0	2	2	**1**	100	-	100
EMPLOYABILITY ENHANCEMENT COURSE											
9	24SSP39	Aptitude and Coding Skills-III	EEC	0	0	2	2	**1**	60	40	100
		TOTAL		18	3	8	29	**25**	**900**		

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

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	24MET46	Strength of Materials	PCC	3	1	0	4	**4**	40	60	100
3	24MET42	Manufacturing Technology-II	PCC	3	0	0	3	**3**	40	60	100
4	24MET43	Machine Drawing	PCC	3	1	0	4	**4**	40	60	100
5	24GET49	Universal Human Values	HSMC	3	0	0	3	**3**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT											
6	24MEI41	Thermal Engineering	PCC	3	0	2	5	**4**	50	50	100
LABORATORY COURSES											
7	24MEP46	Strength of Materials Laboratory	PCC	0	0	2	2	**1**	60	40	100
8	24MEP42	Design Studio-II	PCC	0	0	2	2	**1**	100	-	100
EMPLOYABILITY ENHANCEMENT COURSE											
9	24SSP49	Aptitude and Coding Skills-IV	EEC	0	0	2	2	**1**	60	40	100
TOTAL				18	3	8	29	**25**	**900**		

SEMESTER V

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1	24MET51	Design of Machine Elements	PCC	3	1	0	4	**4**	40	60	100
2		Professional Elective – I	PEC	3	0	0	3	**3**	40	60	100
3		Professional Elective – II	PEC	3	0	0	3	**3**	40	60	100
4		Open Elective – I	OEC	3	0	0	3	**3**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT											
5	24MEI51	Metrology and Measurements	PCC	3	0	2	5	**4**	50	50	100
6	24MEI52	Theory of Machines	PCC	3	0	2	5	**4**	50	50	100
LABORATORY COURSES											
7	24MEP51	CAD/CAM Laboratory	PCC	0	0	2	2	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE											
8	24MEP52	Internship – I *	EEC	0	0	0	0	**1**	100	-	100
MANDATORY COURSE											
9		Mandatory Course – II	MC	2	0	0	2	**0**	100	-	100
TOTAL				20	1	6	27	**23**	**900**		

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

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

SEMESTER VI

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1	24MET61	Heat and Mass Transfer	PCC	3	1	0	4	**4**	40	60	100
2	24MET62	Design of Transmission systems	PCC	3	1	0	4	**4**	40	60	100
3		Professional Elective – III	PEC	3	0	0	3	**3**	40	60	100
4		Professional Elective – IV	PEC	3	0	0	3	**3**	40	60	100
5		Open Elective – II	OEC	3	0	0	3	**3**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT											
6	24MEI66	Finite Element Analysis	PCC	3	0	2	5	**4**	50	50	100
LABORATORY COURSES											
7	24MEP61	Heat and Mass Transfer Laboratory	PCC	0	0	2	2	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSES											
8	24MEP62	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	2	8	30	**24**	**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		Management Elective	HSMC	3	0	0	3	**3**	40	60	100
3		Professional Elective – V	PEC	3	0	0	3	**3**	40	60	100
4		Professional Elective – VI	PEC	3	0	0	3	**3**	40	60	100
5		Open Elective – III	OEC	3	0	0	3	**3**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT											
6	24MEI71	Mechatronics	PCC	3	0	2	5	**4**	50	50	100
EMPLOYABILITY ENHANCEMENT COURSE											
7	24MEP71	Project Phase – I	EEC	0	0	4	4	**2**	60	40	100
8	24MEP72	Internship – II *	EEC	0	0	0	0	**1**	-	100	100
TOTAL				18	0	6	24	**22**	**800**		

*** - 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	24MEP81	Project Phase – II	EEC	0	0	16	16	**8**	60	40	100
TOTAL				0	0	16	16	**8**	**100**		
TOTAL CREDITS								**169**			

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

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	தமிழர் மரபு / Heritage of Tamils	I	1	0	0	1	**1**	40	60	100
3	24GET29	தமிழரும் தொழில் நுட்பமும் / 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		Management Elective	VII	3	0	0	3	**3**	40	60	100
		TOTAL		14	0	2	16	**15**			

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	24PHI06	Applied Physics	I	3	0	2	5	**4**	50	50	100
3	24MAI29	Probability and Statistics	II	2	1	2	5	**4**	50	50	100
4	24CHI07	Applied Chemistry	II	3	0	2	5	**4**	50	50	100
5	24MAT36	Transforms and Complex Variables	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**			

ENGINEERING SCIENCES COURSES(ESC)											
S. No.	**Course Code**	**Course Title**	**Semester**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
1	24ITT16	Programming for Problem Solving	I	3	0	0	3	**3**	40	60	100
2	24ITP16	Programming for Problem Solving Laboratory	I	0	0	2	2	**1**	60	40	100
3	24GEP17	Manufacturing Practices Laboratory	I	0	0	2	2	**1**	60	40	100
4	24CST29	Python Programming	II	3	0	0	3	**3**	40	60	100
5	24EET06	Basics of Electrical and Electronics Engineering	II	3	0	0	3	**3**	40	60	100
6	24CSP29	Python Programming Laboratory	II	0	0	2	2	**1**	60	40	100
		TOTAL		**09**	**0**	**6**	**15**	**12**			

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	24MEP52	Internship – I	V	0	0	0	0	**1**	100	-	100
6	24MEP62	Mini Project	VI	0	0	4	4	**2**	60	40	100
7	24MEP71	Project Phase - I	VII	0	0	4	4	**2**	60	40	100
8	24MEP72	Internship – II	VII	0	0	0	0	**1**	100	-	100
9	24MEP81	Project Phase – II	VIII	0	0	16	16	**8**	60	40	100
		TOTAL		**0**	**0**	**32**	**32**	**18**			

TOTAL NUMBER OF CREDITS TO BE EARNED FOR AWARD OF THE DEGREE = 169
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.

PROFESSIONAL ELECTIVE COURSES: VERTICALS

VERTICAL 1	VERTICAL 2	VERTICAL 3	VERTICAL 4	VERTICAL 5	VERTICAL 6
PRODUCT AND PROCESS DEVELOPMENT	**DIGITAL AND GREEN MANUFACTURING**	**ROBOTICS AND AUTOMATION**	**MODERN MOBILITY SYSTEMS**	**THERMAL ENGINEERING**	**PRODUCTION ENGINEERING**
Value Engineering	Digital Manufacturing and IoT	Sensors and instrumentation	Automotive Materials, Design and Testing	Gas Dynamics and Jet Propulsion	Flexible Manufacturing Systems
3D Printing	Green Manufacturing Design and Practices	Robotics	Renewable powered Off Highway Vehicles and Emission control Technology	Refrigeration and Air Conditioning	Maintenance Engineering
Non Destructive Testing and Evaluation	Modern Robotics	Drone Technologies	Conventional and Futuristic vehicle Technology	Power Plant Engineering	CAD/CAM
Process Planning and Cost Estimation	Lean Manufacturing	Smart mobility and Intelligent Vehicles	Advanced Vehicle Engineering	Unconventiona l Energy Sources	Hydraulic and Pneumatic Systems
Ergonomics In Design	Energy Saving Machinery and Components	Micro-Electromechanical Systems	Automobile Engineering	Design of Pressure Vessels	Design of Jigs, Fixtures and Press Tools
Operations Research	Green Supply Chain Management	Measurements and Controls	Vehicle Health Monitoring	Advanced Internal Combustion Engineering	Composite Materials
Product Life Cycle Management	Smart Manufacturing	MEMS and NEMS	Tractors and Farm Equipment	Turbo Machines	Non Traditional Machining Processes
Product Design and Development	Computer Integrated Manufacturing	Electrical Drives and Actuators	Thermal Management of Batteries and Fuel cells	Nuclear Engineering	Casting and Welding Processes

PROFESSIONAL ELECTIVE COURSES: VERTICALS

VERTICAL 1 : PRODUCT AND PROCESS DEVELOPMENT										
S. No.	Course Code	Course Title	Periods / Week				Credit	Max. Marks		
			L	T	P	Tot		CA	ES	Tot
1	24MEE01	Value Engineering	3	0	0	3	**3**	40	60	100
2	24MEE02	3D Printing	3	0	0	3	**3**	40	60	100
3	24MEE03	Non Destructive Testing and Evaluation	3	0	0	3	**3**	40	60	100
4	24MEE04	Process Planning and Cost Estimation	3	0	0	3	**3**	40	60	100
5	24MEE05	Ergonomics In Design	3	0	0	3	**3**	40	60	100
6	24MEE06	Operations Research	3	0	0	3	**3**	40	60	100
7	24MEE07	Product Life Cycle Management	3	0	0	3	**3**	40	60	100
8	24MEE08	Product Design and Development	3	0	0	3	**3**	40	60	100
VERTICAL 2: DIGITAL AND GREEN MANUFACTURING										
S. No.	Course Code	Course Title	Periods / Week				Credit	Max. Marks		
			L	T	P	Tot		CA	ES	Tot
1	24MEE09	Digital Manufacturing and IoT	3	0	0	3	**3**	40	60	100
2	24MEE10	Green Manufacturing Design and Practices	3	0	0	3	**3**	40	60	100
3	24MEE11	Modern Robotics	3	0	0	3	**3**	40	60	100
4	24MEE12	Lean Manufacturing	3	0	0	3	**3**	40	60	100
5	24MEE13	Energy Saving Machinery and Components	3	0	0	3	**3**	40	60	100
6	24MEE14	Green Supply Chain Management	3	0	0	3	**3**	40	60	100
7	24MEE15	Smart Manufacturing	3	0	0	3	**3**	40	60	100
8	24MEE16	Computer Integrated Manufacturing	3	0	0	3	**3**	40	60	100
VERTICAL 3: ROBOTICS AND AUTOMATION										
S. No.	Course Code	Course Title	Periods / Week				Credit	Max. Marks		
			L	T	P	Tot		CA	ES	Tot
1	24MEE17	Sensors and instrumentation	3	0	0	3	**3**	40	60	100
2	24MEE18	Robotics	3	0	0	3	**3**	40	60	100
3	24MEE19	Drone Technologies	3	0	0	3	**3**	40	60	100
4	24MEE20	Smart mobility and Intelligent Vehicles	3	0	0	3	**3**	40	60	100
5	24MEE21	Micro-Electromechanical Systems	3	0	0	3	**3**	40	60	100
6	24MEE22	Measurements and Controls	3	0	0	3	**3**	40	60	100
7	24MEE23	MEMS and NEMS	3	0	0	3	**3**	40	60	100
8	24MEE24	Electrical Drives and Actuators	3	0	0	3	**3**	40	60	100

VERTICAL 4: MODERN MOBILITY SYSTEMS										
S. No.	Course Code	Course Title	Periods / Week				Credit	Max. Marks		
			L	T	P	Tot		CA	ES	Tot
1	24MEE25	Automotive Materials, Design and Testing	3	0	0	3	**3**	40	60	100
2	24MEE26	Renewable powered Off Highway Vehicles and Emission control Technology	3	0	0	3	**3**	40	60	100
3	24MEE27	Conventional and Futuristic vehicle Technology	3	0	0	3	**3**	40	60	100
4	24MEE28	Advanced Vehicle Engineering	3	0	0	3	**3**	40	60	100
5	24MEE29	Automobile Engineering	3	0	0	3	**3**	40	60	100
6	24MEE30	Vehicle Health Monitoring	3	0	0	3	**3**	40	60	100
7	24MEE31	Tractors and Farm Equipment	3	0	0	3	**3**	40	60	100
8	24MEE32	Thermal Management of Batteries and Fuel cells	3	0	0	3	**3**	40	60	100
VERTICAL 5 :THERMAL ENGINEERING										
S. No.	Course Code	Course Title	Periods / Week				Credit	Max. Marks		
			L	T	P	Tot		CA	ES	Tot
1	24MEE33	Gas Dynamics and Jet Propulsion	3	0	0	3	**3**	40	60	100
2	24MEE34	Refrigeration and Air Conditioning	3	0	0	3	**3**	40	60	100
3	24MEE35	Power Plant Engineering	3	0	0	3	**3**	40	60	100
4	24MEE36	Unconventional Energy Sources	3	0	0	3	**3**	40	60	100
5	24MEE37	Design of Pressure Vessels	3	0	0	3	**3**	40	60	100
6	24MEE38	Advanced Internal Combustion Engineering	3	0	0	3	**3**	40	60	100
7	24MEE39	Turbo Machines	3	0	0	3	**3**	40	60	100
8	24MEE40	Nuclear Engineering	3	0	0	3	**3**	40	60	100
VERTICAL 6: PRODUCTION ENGINEERING										
S. No.	Course Code	Course Title	Periods / Week				Credit	Max. Marks		
			L	T	P	Tot		CA	ES	Tot
1	24MEE41	Flexible Manufacturing Systems	3	0	0	3	**3**	40	60	100
2	24MEE42	Maintenance Engineering	3	0	0	3	**3**	40	60	100
3	24MEE43	CAD/CAM	3	0	0	3	**3**	40	60	100
4	24MEE44	Hydraulic and Pneumatic Systems	3	0	0	3	**3**	40	60	100
5	24MEE45	Design of Jigs, Fixtures and Press Tools	3	0	0	3	**3**	40	60	100
6	24MEE46	Composite Materials	3	0	0	3	**3**	40	60	100
7	24MEE47	Non Traditional Machining Processes	3	0	0	3	**3**	40	60	100
8	24MEE48	Casting and Welding Processes	3	0	0	3	**3**	40	60	100

OPEN ELECTIVE COURSES											
AUTOMOBILE ENGINEERING											
S. No.	**Course Code**	**Course Title**	**Category**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
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
BIO MEDICAL ENGINEERING											
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
CIVIL ENGINEERING											
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
COMPUTER SCIENCE AND DESIGN											
20.	24CDO01	Animation Basics	OEC	3	0	0	3	**3**	40	60	100
21.	24CDO02	Data Visualization Techniques	OEC	3	0	0	3	**3**	40	60	100
COMPUTER SCIENCE AND ENGINEERING											
22.	24CSO01	Programming in Java	OEC	3	0	0	3	**3**	40	60	100
23.	24CSO02	Fundamentals of Operating Systems	OEC	3	0	0	3	**3**	40	60	100
24.	24CSO03	Fundamentals of Database Systems	OEC	3	0	0	3	**3**	40	60	100
25.	24CSO04	Internet Programming	OEC	3	0	0	3	**3**	40	60	100
26.	24CSO05	Artificial Intelligence and Machine Learning	OEC	3	0	0	3	**3**	40	60	100
COMPUTER SCIENCE AND ENGINEERING(IOT)											
27.	24IOO01	Internet of Thing and its Applications	OEC	3	0	0	3	**3**	40	60	100
28.	24IOO02	Sensors and Actuator Devices	OEC	3	0	0	3	**3**	40	60	100
29.	24IOO03	Mobile Application Development	OEC	3	0	0	3	**3**	40	60	100

COMPUTER SCIENCE AND ENGINEERING(CYBER SECURITY)												
30.	24CBO01	Fundamentals of Cyber security	OEC	3	0	0	3	**3**	40	60	100
31.	24CBO02	Penetration and Vulnerability Testing Techniques	OEC	3	0	0	3	**3**	40	60	100
32.	24CBO03	Basics of Digital Forensics	OEC	3	0	0	3	**3**	40	60	100
33.	24CBO04	Introduction to Ethical Hacking	OEC	3	0	0	3	**3**	40	60	100
34.	24CBO05	Malware analysis	OEC	3	0	0	3	**3**	40	60	100
ELECTRICAL AND ELECTRONICS ENGINEERING												
35.	24EEO01	Electrical Drives and Control	OEC	3	0	0	3	**3**	40	60	100
36.	24EEO02	Electrical Power Generation Systems	OEC	3	0	0	3	**3**	40	60	100
37.	24EEO03	Industrial Automation	OEC	3	0	0	3	**3**	40	60	100
38.	24EEO04	Electrical Instruments and Measurements	OEC	3	0	0	3	**3**	40	60	100
39.	24EEO05	Energy Conservation and Management	OEC	3	0	0	3	**3**	40	60	100
40.	24EEO06	Electrical Wiring, Estimation and Costing	OEC	3	0	0	3	**3**	40	60	100
41.	24EEO07	Fundamentals of Electrical Machinery	OEC	3	0	0	3	**3**	40	60	100
42.	24EEO08	Fundamentals of Electric Vehicle	OEC	3	0	0	3	**3**	40	60	100
ELECTRONICS AND COMMUNICATION ENGINEERING												
43.	24ECO01	Consumer Electronics	OEC	3	0	0	3	**3**	40	60	100
44.	24ECO02	NANO Technology	OEC	3	0	0	3	**3**	40	60	100
45.	24ECO03	Fundamentals of Robotics	OEC	3	0	0	3	**3**	40	60	100
46.	24ECO04	Principles of Communication	OEC	3	0	0	3	**3**	40	60	100
47.	24ECO05	Electronics and Microprocessor	OEC	3	0	0	3	**3**	40	60	100
INFORMATION TECHNOLOGY												
48.	24ITO01	Block chain Technologies	OEC	3	0	0	3	**3**	40	60	100
49.	24ITO02	Cyber security Fundamentals	OEC	3	0	0	3	**3**	40	60	100
50.	24ITO03	Cloud computing Techniques	OEC	3	0	0	3	**3**	40	60	100
51.	24ITO04	Data Science using R	OEC	3	0	0	3	**3**	40	60	100
52.	24ITO05	Fundamentals of Business Intelligence	OEC	3	0	0	3	**3**	40	60	100
SAFETY AND FIRE ENGINEERING												
53.	24SFO01	Occupational health and hygiene	OEC	3	0	0	3	**3**	40	60	100
54.	24SFO02	Construction safety	OEC	3	0	0	3	**3**	40	60	100
55.	24SFO03	Building fire safety	OEC	3	0	0	3	**3**	40	60	100
56.	24SFO04	Legal aspects of safety	OEC	3	0	0	3	**3**	40	60	100
57.	24SFO05	Safety measures for engineers	OEC	3	0	0	3	**3**	40	60	100
OPEN ELECTIVES OFFERED BY MECHANICAL ENGINEERING												
1.	24MEO01	Basic Mechanical Engineering	OEC	3	0	0	3	**3**	40	60	100
2.	24MEO02	Solar Energy Utilization	OEC	3	0	0	3	**3**	40	60	100
3.	24MEO03	Selection of Materials	OEC	3	0	0	3	**3**	40	60	100
4.	24MEO04	Fibre Reinforced Plastics	OEC	3	0	0	3	**3**	40	60	100
5.	24MEO05	Rapid Prototyping	OEC	3	0	0	3	**3**	40	60	100

MANDATORY COURSE – I, II & III											
S. No.	**Course Code**	**Course Title**	**Category**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
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

MANAGEMENT ELECTIVES											
S. No.	**Course Code**	**Course Title**	**Category**	**Periods / Week**				**Credit**	**Max. Marks**		
				L	**T**	**P**	**Tot**		**CA**	**ES**	**Tot**
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

Summary										
Name of the Programme: B.E Mechanical Engineering										
CATEGORY	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**TOTAL CREDITS**	**%**
HSMC	4	2	-	3	-	-	6	-	**15**	**8.98**
BSC	8	8	4	4	-	-	-	-	**24**	**14.37**
ESC	5	7	-	-	-	-	-	-	**12**	**07.10**
PCC	4	2	20	17	13	13	4	-	**73**	**43.19**
PEC	-	-	-	-	6	6	6	-	**18**	**10.65**
OEC	-	-	-		3	3	3	-	**9**	**5.33**
EEC	1	1	1	1	1	2	3	8	**18**	**10.65**
MC	✓	-	-	-	✓	✓	-	-	**-**	**-**
Total	**22**	**20**	**25**	**25**	**23**	**24**	**22**	**8**	**169**	**100**

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 &technicalblogs, **Writing**-Paragraph writing, ShortReport 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, newsreports 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, RSSalaria, 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	1	1
CO2	-	-	-	-	-	-	-	2	3	-	3	1	1
CO3	-	-	-	-	-	-	-	2	3	-	3	1	1
CO4	-	-	-	-	-	-	-	2	3	-	3	1	1
CO5	-	-	-	-	-	-	-	2	3	-	3	1	1
Avg.	-	-	-	-	-	-	-	2	3	-	3	1	1

1-low, 2-medium, 3-high

24MET16	ENGINEERING DRAWING	Category	L	T	P	C
		PCC	2	0	4	4

(Common to AE,ME & SF)

PREREQUISITE:

Student must have the basic knowledge of geometry, trigonometry and algebra, along with an introduction to fundamental engineering concepts. Students should also possess knowledge on traditional drafting tools such as scales, compasses, and protractors. The ability to visualize and interpret three-dimensional objects from two-dimensional drawings.

OBJECTIVES:

- To understand the basic principles of engineering drawing and Engineering curves.
- To impart knowledge on the projection of points, lines and plane surfaces.
- To improve the visualization skills for better understanding of projection of solids
- To develop the imaginative skills of the students required to understand Section of solids and Developments of surfaces
- To make the students understand the viewing of Orthographic and Isometric projections

UNIT - I	PLANE CURVES	6 + 12 = 18

Introduction on drafting instruments, BIS conventions and specifications, Lettering and Dimensioning-Conics-Construction of ellipse, parabola and hyperbola by eccentricity method -Construction of cycloid-Construction of involutes-Drawing of tangents and normal to the above curves.

UNIT - II	PROJECTION OF POINTS, LINES AND PLANE SURFACES	6 + 12 = 18

Projection of points and straight lines located in the first quadrant inclined to both the planes -Determination of true lengths and true inclinations - Projection of polygonal surface and circular lamina inclined to any one reference plane.

UNIT - III	PROJECTION OF SOLIDS	6 + 12 = 18

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

UNIT - IV	SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES	6 + 12 = 18

Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other- Obtaining true shape of section. Development of lateral surfaces of simple and truncated solids-Prisms, pyramids, cylinders and cones.

UNIT - V	ORTHOGRAPHIC VIEWS AND ISOMETRIC PROJECTIONS	6 + 12 = 18

Introduction - Free hand sketching of multiple views from pictorial views of objects. Principle of Isometric projection – isometric projection of simple solids and truncated solids of prism, pyramid, cylinder and cone. Introduction to AutoCAD Practicing three dimensional modeling of isometric projection of simple objects by CAD software. (Not for examination)

TOTAL: 90 PERIODS

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

COs	Course Outcome	Cognitive Level
CO1	Gain knowledge on basic drafting convention and perform sketching of basic geometrical constructions of conic curves, involutes and cycloid.	**Understand**
CO2	Draw the projection of points, lines and plane surfaces inclined to principle planes.	**Apply**
CO3	Practicing projections of simple solids which are inclined to reference planes by change of position method.	**Apply**
CO4	Construct sectional views and development of surfaces of simple and truncated solids	**Apply**
CO5	Discover the orthographic and isometric views of the objects.	**Apply**

TEXT BOOKS:

1. Natarajan, K.V., A text book of Engineering Graphics, Dhanalakshmi Publishers, Chennai, 2020.
2. Kumar, M.S., Engineering Graphics, D.D. Publications, 2019.

REFERENCES:

1. Venugopal & Prabhu Raja, V., Engineering Graphics, New Age International (P) Limited, 2009.
2. Bhatt, N.D., Engineering Drawing, Charotar Publishing House, Fifty Third Edition, 2020.
3. Shah, B., and Rana, B.C., Engineering Drawing , Pearson Education ,2009.
4. Gopalakrishna, K.R., Engineering Drawing (Vol.I & II), Subhas Publications, 2017.
5. Basant Agarwal and Agarwal C.M., Engineering Drawing, Tata McGraw Hill Publishing Company Limited, 2019

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	2	2	2	2	-	-	-	2	-	-	2	2	3
CO2	2	2	2	2	2	-	-	-	2	-	-	2	2	3
CO3	2	2	3	3	2	-	-	-	2	-	-	2	2	3
CO4	3	2	3	2	3	-	-	-	2	-	-	2	2	3
CO5	3	3	3	3	3	-	-	-	2	-	-	2	2	3
Avg.	2.4	2.2	2.6	2.4	2.4	-	-	-	2	-	-	2	2	3

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

1-low, 2-medium, 3-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, தோல்பாவைக்கூத்து, 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	1	1
CO2	*தமிழர்களின் சிற்பக்கலை ஓவியக்கலை மற்றும் இசைக் கருவிகள் குறித்த தெளிவு*	-	-	-	-	-	3	3	-	2	-	3	1	1
CO3	*தமிழர்களின் நாட்டுப்புறக்கலைகள் மற்றும் வீரவிளையாட்டுகள் குறித்த தெளிவு*	-	-	-	-	-	3	3	-	2	-	3	1	1
CO4	*தமிழர்களின் திணைக் கோட்பாடுகள், சங்ககால வணிகம் மற்றும் சோழர்களின் வெற்றிகள் குறித்த தகவல்கள்.*	-	-	-	-	-	3	3	-	2	-	3	1	1
CO5	*இந்திய தேசிய இயக்கம், சுயமரியாதை இயக்கம் மற்றும் சித்த மருத்தவம் பற்றிய புரிதல்.*	-	-	-	-	-	3	3	-	2	-	3	1	1
	Average	-	-	-	-	-	3	3	2	-	-	3	1	1

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

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	1	1
CO2	Apprehend the heritage of sculpture, painting and musical instruments of ancient people.	-	-	-	-	-	3	3	-	2	-	3	1	1
CO3	Review on folk and martial arts of Tamil people.	-	-	-	-	-	3	3	-	2	-	3	1	1
CO4	Insightthinai concepts, trade and victory of Chozha dynasty.	-	-	-	-	-	3	3	-	2	-	3	1	1
CO5	Realize the contribution of Tamil in Indian freedom struggle, self-esteem movement and siddha medicine.	-	-	-	-	-	3	3	-	2	-	3	1	1
	Average	-	-	-	-	-	3	**3**	-	**2**	-	**3**	1	1

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

24MAI19	MATRICES AND 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 eigenv ectors 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", NarosaPublications, 8th Edition, 2012.
4. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley India, New Delhi, 10th Edition 2016.
5. https://archive.nptel.ac.in/courses/111/108/111108157/
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	PO111	PSO1	PSO2
CO1	3	3	3	3	2	1	-	-	-	-	1	1	1
CO2	3	3	3	3	2	1	-	-	-	-	1	1	1
CO3	3	3	3	3	2	1	-	-	-	-	1	1	1
CO4	3	3	3	3	2	1	-	-	-	-	1	1	1
CO5	3	3	3	3	2	1	-	-	-	-	1	1	1
Avg.	**3**	**3**	**3**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**1**	**1**	**1**

1-low, 2-medium, 3-high

24PHI06	APPLIED PHYSICS	Category	L	T	P	C
		BSC	3	0	2	4

(Common to AE, CE, ME & SFE)

PREREQUISITE:

The students must have knowledge about basic concepts of sound, light, arrangement of atoms in crystalline solids, modern engineering materials, magnetic and super conducting materials and their applications.

OBJECTIVES :

- To compute and analyze various problems applicable to engineering physics.
- To inculcate the prime concepts, propagation and industrial applications of sound wave.
- To comprehend the fundamentals of crystal physics thereby exploring it for potential engineering applications.
- To emphasize the basic concepts of new engineering materials.
- To assimilate the different types of magnetic material and its applications in the field of engineering.

UNIT – I	ACOUSTICS AND ULTRASONICS	(9)

Acoustics–Introduction – classification of sound – characteristics of musical sound – loudness – Weber – Fechner law – decibel – absorption co-efficient – reverberation – reverberation time – Sabine‘s formula: growth and decay (derivation) – factors affecting acoustics of buildings and their remedies. Ultrasonics – production – Piezoelectric method – properties – velocity measurement: acoustical grating – applications – SONAR, NDT – ultrasonic flaw detection technique.

UNIT – II	LASER TECHNOLOGY	(9)

Introduction – principle of spontaneous emission and stimulated emission – Einstein’s co-efficients A & B(derivation) – population inversion, pumping – types of laser – molecular beam laser (CO_2) and homo – junction and hetero – junction semiconductor lasers (qualitative analysis only) – industrial applications: lasers in welding, heat treatment and cutting – holography (construction and reconstruction of images).

UNIT – III	CRYSTAL PHYSICS	(9)

Introduction to crystalline and amorphous solids – lattice and unit cell – seven crystal systems and Bravais lattices – Miller indices(hkl) – d-spacing in cubic lattice – atomic radius – co-ordination number – packing factor of SC, BCC, FCC and HCP structures – crystal defects – point, line and surface defects.

UNIT – IV	MODERN ENGINEERING MATERILAS	(9)

New engineering materials: Metallic glasses – preparation, properties and applications – Shape memory alloys (SMA) – characteristics, properties of Ni-Tialloy – applications – advantages and disadvantages of SMA. Smart materials –smart fluids –electrorheologicalfluids (ERF)–magnetorheologicalfluids (MRF) – effect of temperature in fluids and itsapplications.

UNIT - V	MAGNETIC AND SUPERCONDUCTING MATERIALS	(9)

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

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

List of exercises/experiments:

1. Determine the frequency of sound waves using sonometer.
2. Calculate the velocity of ultrasonic waves and compressibility of the given liquid using Ultrasonic interferometer.
3. By forming interference fringes, determine the width of one fringe and hence calculate the thickness of the given thin paper.
4. For a given optical fibre determine the acceptance angle and numerical aperture.
5. Compute the band gap of an intrinsic semiconductor.
6. Evaluate the wave length of a semiconductor laser.
7. Enumerate the viscosity of a given liquid by Poiseuille’s method.
8. Using non – uniform bending method calculate the Young’s modulus of the given beam.
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	Describe the impact of engineering solutions in the constructional and designing environment.	Understand
CO2	Categorize the types of laser and utilize it for specific application based on their desirable requisite.	Analyze
CO3	Utilize the conceived concepts and techniques for synthesizing novel crystals with enhanced multifunctional properties.	Apply
CO4	Enumerate the preambles of modern engineering materials and implement its concepts to tackle the cumbersome new engineering materials.	Apply
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, 11 th Edition, 2018.
2. R.K. Gaur & S.L. Gupta, "Engineering Physics", Dhanpat Rai Publication, New Delhi, 7 th Edition, 2014.

Reference Books :

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

Mapping of COs with POs and PSOs

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

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

1-low, 2-medium, 3-high

24GEP17	MANUFACTURING PRACTICES LABORATORY	Category	L	T	P	C
		ESC	0	0	2	1

(Common to AE, CE, MECH & SFE)

PREREQUISITE:

Students must have a basic knowledge on the topics from Civil works and Mechanical Engineering such as Plumbing, Carpentry, Welding, Machining and Electrical & Electronics basic components.

OBJECTIVES:

- To provide students with hands-on experience on various basic engineering practices in mechanical engineering.
- To make the students understand all the fundamental concepts involving Plumbing and Carpentry work.
- To know the different welding processes and sheet metal work procedures practically.
- To learn the operation of basic machining of simple facing and turning using lathe.
- To acquire the basic operation of ceiling fan, iron box and logic gates.

List of Exercise/Experiments:

GROUP A (CIVIL) (12)

PLUMBING WORK

1. Preparing plumbing line sketches
2. Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, Elbows and other components which are commonly used in household.

CARPENTRY WORK

3. Sawing and planning work
4. Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.

GROUP B (MECHANICAL) (14)

WELDING WORK

5. Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.

BASIC MACHINING WORK

6. Simple Facing and Turning operation using centre lathe.
7. Drilling and Tapping using drilling machine

SHEET METAL WORK

8. Making of a square tray.

GROUP C (ELECTRICAL & ELECTRONICS) (04)

9. Study of Ceiling Fan and Iron Box
10. Study of logic gates AND, OR, EX-OR and NOT.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Draw pipe line plan, lay and connect various pipe fittings used in common house hold plumbing work.	Apply
CO2	Make joints in wood materials used in common household wood work	Apply
CO3	Weld various joints in steel plates using arc welding work	Apply
CO4	Make use of lathe and drilling machine for turning, drilling and tapping.	Apply
CO5	Interpret the key components and basic functions of a ceiling fan, iron box and logic gates.	Understand

REFERENCES:

1. Dr. V. Ramesh Babu. Engineering Practices Laboratory Manual, VRB Publishers, Revised Edition 2019-2020

2. S Gowri & T Jeyapoovan Engineering Practices Lab Manual, Vikas Publishing,5th Edition.

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	3	-	-	-	2	3	-	-	3	3	2
CO2	3	3	2	3	-	-	-	2	3	-	-	3	3	2
CO3	3	3	3	3	-	-	-	2	3	-	-	3	3	2
CO4	3	3	3	3	-	-	-	2	3	-	-	3	3	2
CO5	3	3	3	3	-	-	-	2	3	-	-	3	3	2
Avg.	3	3	3	3	-	-	-	2	3	-	-	3	3	2

1-low, 2-medium, 3-high

24SSP19	APTITUDE AND CODING SKILLS – 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	1	2
CO2	3	3	3	-	3	3	-	3	1	-	3	1	2
CO3	3	3	3	-	3	3	-	3	3	-	3	1	2
CO4	-	-	-	-	3	3	-	3	3	-	3	1	2
CO5	3	3	3	-	3	3	-	3	2	-	3	1	2
Avg.	**2.4**	**2.4**	**2.4**	**-**	**3**	**3**	**-**	**3**	**2**	**-**	**3**	**1**	**2**

24CST29	PYTHON PROGRAMMING	Category	L	T	P	C
		ESC	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	1	3
CO2	3	3	3	2	2	-	-	1	-	-	3	1	3
CO3	3	3	3	2	2	-	-	1	-	-	3	1	3
CO4	3	3	3	3	2	-	-	1	-	-	2	1	3
CO5	3	3	3	3	2	-	-	1	-	-	2	1	3
Avg.	**3**	**3**	**3**	**2**	**2**	-	-	**1**	-	-	**3**	1	**3**

1-low, 2-medium, 3-high

24MET26	DESIGN THINKING	Category	L	T	P	C
		PCC	2	0	0	2

PREREQUISITE

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: 30 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**	**2**	**3**
CO2	3	3	**2**	**2**	**2**	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**3**
CO3	3	3	**3**	**3**	**3**	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**3**
CO4	3	3	**3**	**3**	**3**	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**3**
CO5	3	3	**3**	**3**	**3**	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**3**
Avg.	**3**	**3**	**3**	**2.6**	**2.6**	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**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	2
CO2	3	3	2	-	-	-	-	-	-	-	-	2	1	2
CO3	3	3	2	-	-	-	-	-	-	-	-	2	1	2
CO4	3	3	2	-	-	-	-	-	-	-	-	2	1	2
CO5	3	3	2	-	-	-	-	-	-	-	-	2	1	2
Avg.	3	3	2	-	-	-	-	-	-	-	-	2	1	2

1-low, 2-medium, 3-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,*	*புரிதல்*

	நீர்ப்பாசன முறைகள் மற்றும் முத்து குளித்தல் குறித்த தெளிவு	
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	1	1
CO2	*சங்ககாலத் தமிழிர்களின் கட்டிட தொழில் நுட்பம் கட்டுமான பொருட்கள் மற்றும் அவற்றை விளகும் தளங்கள் குறித்து அறிவு*	-	-	-	-	-	3	3	-	2	-	3	1	1
CO3	*சங்ககாலத் தமிழிர்களின் உலோகத் தொழில், நாணயங்கள் மற்றும் மணிகள் சார்ந்த தொல்லியல் சான்றுகள் பற்றிய அறிவு*	-	-	-	-	-	3	3	-	2	-	3	1	1
CO4	*சங்ககாலத் தமிழிர்களின் வேளாண்மை, நீர்ப்பாசன முறைகள் மற்றும் முத்து குளித்தல் குறித்த தெளிவு*	-	-	-	-	-	3	3	-	2	-	3	1	1
CO5	*நவீன அறிவியல் தமிழ் மற்றும் கன்னிதமிழ் குறித்த புரிந்து கொள்ளலும் மற்றும் பயன்படுத்தலும்*	-	-	-	-	-	3	3	-	2	-	3	1	1
	Average	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**2**	**-**	**3**	**1**	**1**

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

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	1	1
CO2	Comprehend the construction technology, building materials in sangamPeriod and case studies.	-	-	-	-	-	3	3	-	2	-	3	1	1
CO3	Infer the metal process, coin and beads manufacturing with relevantarcheological evidence	-	-	-	-	-	3	3	-	2	-	3	1	1
CO4	Realize the agriculture methods, irrigation technology and pearl diving.	-	-	-	-	-	3	3	-	2	-	3	1	1
CO5	Apply the knowledge of scientific Tamil and Tamil computing.	-	-	-	-	-	3	3	-	2	-	3	1	1
	Average	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**2**	**-**	**3**	**1**	**1**

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

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. Findthe$\bar{X}$ 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	3	2
CO2	3	3	3	3	2	-	-	-	1	-	1	3	2
CO3	3	3	3	3	2	-	-	-	1	-	1	3	2
CO4	3	3	3	3	2	-	-	-	1	-	1	3	2
CO5	3	3	3	3	2	-	-	-	1	-	1	3	2
Avg.	3	3	3	3	2	-	-	-	1	-	1	3	2

1-low, 2-medium, 3-high

24CHI07	APPLIED CHEMISTRY	Category	L	T	P	C
		BSC	3	0	2	4

(Common to AE, CE, MECH and SFE)

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 imbibe basic concepts and applications of phase rule and lubricants.
- To impart knowledge on manufacturing advanced engineering materials and its uses.

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	PHASE RULE & LUBRICANTS	(9)

Phase rule: Introduction, definition of terms with examples. One component system – water system; Reduced phase rule; Two component system: lead-silver system. Lubricants – definition – function – characteristics – properties – viscosity index, flash and fire points, cloud and pour points, oiliness; Solid lubricants – graphite and MoS_2.

UNIT - V	ADVANCED ENGINEERING MATERIALS	(9)

Abrasives – Moh's scale of hardness – types – natural [Diamond] – synthetic [SiC]; Refractories – characteristics – classifications [Acidic, basic and neutral refractories] – properties – refractoriness – RUL – porosity – thermal spalling; Nano materials – CNT– synthesis [CVD, laser evaporation, pyrolysis] – applications of nano materials.

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 Knowledge of phase rule and lubricants for materials choosing.	Apply
CO5	Identify the manufacturing processes of advanced engineering materials and its uses.	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

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

1-low, 2-medium, 3-high

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.

24CSP29	PYTHON PROGRAMMING LABORATORY	Category	L	T	P	C
		ESC	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	1	3
CO2	3	3	3	2	2	3	-	-	1	-	-	1	1	3
CO3	3	3	3	2	2	3	-	-	1	-	-	1	1	3
CO4	3	3	3	1	3	3	-	-	1	-	-	1	1	3
CO5	3	3	3	1	3	3	-	-	1	-	-	1	1	3
Avg.	**3**	**3**	**3**	**2**	**2**	**3**	**-**	**-**	**1**	**-**	**-**	**1**	1	**3**

1-low, 2-medium, 3-high

24SSP29	APTITUDE AND CODING SKILLS –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	1	2
CO2	3	3	3	-	3	3	-	3	1	-	3	1	2
CO3	3	3	3	-	3	3	-	3	3	-	3	1	2
CO4	-	-	-	-	3	3	-	3	3	-	3	1	2
CO5	3	3	3	-	3	3	-	3	2	-	3	1	2
Avg.	**2.4**	**2.4**	**2.4**	**-**	**3**	**3**	**-**	**3**	**2**	**-**	**3**	**1**	**2**