KSR College of Engineering

NAAC ACCREDITED A++ | NBA ACCREDITED PROGRAMMES

AN AUTONOMOUS INSTITUTION

B.E. - CIVIL 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 CIVIL ENGINEERING

B.E. – Civil Engineering

(REGULATIONS 2024)

Vision of the Institution

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

Mission of the Institution

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

Vision of the Department / Programme: (Civil Engineering)

DV	To impart knowledge and excellence in Civil Engineering and Technology with global perspectives to our students and to make them ethically strong engineers to create conducive environment.

Mission of the Department / Programme: (Civil Engineering)

DM 1	To promote innovative thinking in the minds of budding engineers and to make the department a centre of excellence in the field of Engineering.
DM 2	To provide knowledge base and moral autonomy to address regional, national and international needs in Civil Engineering.

Programme Educational Objectives (PEOs): (Civil Engineering)

The graduates of the programme will be able to	
PEO 1	**Successful Career:** Design and contribute to the infrastructure development project being undertaken by various sectors and evolves as a successful engineer.
PEO 2	**Lifelong Learning:** Pursue higher studies so that they can contribute to the society in terms of academic, research, sustainable development and other allied fields.
PEO 3	**Service to Society:** Work effectively and ethically in multicultural and multidisciplinary groups in accordance with technological change for the growth of Civil Engineering projects.

Programme Outcomes (POs) of B.E. Civil Engineering

Program Outcomes (POs)	
PO1	**Engineering Graduates will be able to:** **Engineering Knowledge:** Apply the knowledge of mathematics, natural science, engineering 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 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 in a team, and to manage projects and in multidisciplinary Environments.
PO11	**Life-long Learning:** Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change (WK8).
Program Specific Outcomes (PSOs)	
PSO1	**Research Culture:** Update research knowledge in Civil Engineering to solve the unknown issues that they have not encountered before.
PSO2	**Core Values:** Contribute core Universal values and social good in the community by Civil Engineering Profession.

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Department	Civil Engineering	
Programme	B.E. Civil 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	24CET11	Civil Engineers and society	PCC	3	0	0	3	**3**	40	60	100
3	24GET19	தமிழர்மரபு / Heritage of Tamils	HSMC	1	0	0	1	**1**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT											
4	24MAI19	Matrices and Calculus	BSC	2	1	2	5	**4**	50	50	100
5	24PHI06	Applied Physics	BSC	3	0	2	5	**4**	50	50	100
6	24CEI12	Engineering Graphics	ESC	2	0	3	5	**4**	50	50	100
LABORATORY COURSES											
7	24GEP17	Manufacturing Practices Laboratory	ESC	0	0	2	2	**1**	60	40	100
8	24CEP11	Computer aided Building Drawing	PCC	0	0	2	2	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE											
9	24SSP19	Aptitude and Coding Skill - I	EEC	0	0	2	2	**1**	60	40	100
			TOTAL	**14**	**1**	**13**	**28**	**22**	**900**		

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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	24CET21	Design Thinking	PCC	2	0	0	2	**2**	40	60	100
3	24CET22	Construction Materials, Techniques and Practices	PCC	3	0	0	3	**3**	40	60	100
4	24GET29	தமிழரும் தொழில்நுட்பமும் / 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
9	24CEP21	Construction Materials Laboratory	PCC	0	0	2	2	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE											
10	24SSP29	Aptitude and Coding Skill - II	EEC	0	0	2	2	**1**	60	40	100
MANDATORY COURSES											
11		Mandatory Course - I	MC	1	0	0	0	0	-	-	-
			TOTAL	**15**	**1**	**12**	**27**	**21**	**1000**		

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	24CET31	Highway and Railway Engineering	PCC	3	0	0	3	**3**	40	60	100
3	24CET32	Mechanics of Solids - I	ESC	3	1	0	4	**4**	40	60	100
4	24CET33	Fluid Mechanics and Hydraulics Engineering	ESC	3	0	0	3	**3**	40	60	100
5	24CET34	Surveying	PCC	3	0	0	3	**3**	40	60	100
LABORATORY COURSES											
6	24CEP31	Applied Hydraulic Laboratory	PCC	0	0	2	2	**1**	60	40	100
7	24CEP32	Highway Engineering Laboratory	PCC	0	0	2	2	**1**	60	40	100
8	24CEP33	Survey Engineering Laboratory	PCC	0	0	2	2	**1**	60	40	100
9	24CEP34	Design Studio 1	PCC	0	0	2	2	**1**	100	-	100
EMPLOYABILITY ENHANCEMENT COURSE											
10	24SSP39	Aptitude and Coding Skill - III	EEC	0	0	2	2	**1**	60	40	100
			TOTAL	**15**	**2**	**10**	**27**	**22**	**1000**		

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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	0	0	3	**3**	40	60	100
2	24CET41	Mechanics of Solids - II	PCC	3	1	0	4	**4**	40	60	100
3	24CET42	Soil mechanics	PCC	3	0	0	3	**3**	40	60	100
4	24CET43	Water Supply Engineering	PCC	3	0	0	3	**3**	40	60	100
5	24CEE4n	Professional Elective – I	PEC	3	0	0	3	**3**	40	60	100
6	24GET49	Universal Human Values	HSMC	3	0	0	3	**3**	40	60	100
LABORATORY COURSES											
7	24CEP41	Soil Mechanics Laboratory	PCC	0	0	2	2	**1**	60	40	100
8	24CEP42	Strength of Materials Laboratory	PCC	0	0	2	2	**1**	60	40	100
9	24CEP43	Design Studio 2	PCC	0	0	2	2	**1**	100	-	100
EMPLOYABILITY ENHANCEMENT COURSE											
10	24SSP49	Aptitude and Coding Skill - IV	EEC	0	0	2	2	**1**	60	40	100
			TOTAL	**18**	**1**	**8**	**27**	**23**	**1000**		

SEMESTER V											
S.No	Course Code	Course Title	Category	Periods/ Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1	24CET51	Design of Reinforced Concrete Structures	PCC	3	0	0	3	**3**	40	60	100
2	24CET52	Structural Analysis I	PCC	3	1	0	4	**4**	40	60	100
3	24CET53	Foundation Engineering	PCC	3	0	0	3	**3**	40	60	100
4	24CET54	Waste Water Engineering	PCC	3	0	0	3	**3**	40	60	100
5		Professional Elective – II	PEC	3	0	0	3	**3**	40	60	100
6		Professional Elective – III	PEC	3	0	0	3	**3**	40	60	100
7		Open Elective - I	OEC	3	0	0	3	**3**	40	60	100
LABORATORY COURSE											
8	24CEP51	Environmental Engineering Laboratory	PCC	0	0	2	2	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE											
9	24CEP52	Survey camp*	EEC	0	0	0	0	**1**	100	-	100
MANDATORY COURSES											
10		Mandatory Course - II	MC	1	0	0	1	**0**	100	-	100
			TOTAL	**22**	**1**	**2**	**25**	**24**	**1000**		

*The students should undergo 2 weeks survey camp during the IV semester vacation.

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SEMESTER VI

S.No	Course Code	Course Title	Category	Periods/ Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1	24CET61	Water resources and Irrigation Engineering	ESC	3	0	0	3	**3**	40	60	100
2	24CET62	Design of Steel Structures	PCC	3	1	0	4	**4**	40	60	100
3	24CET63	Structural Analysis II	PCC	3	0	0	3	**3**	40	60	100
4		Professional Elective – IV	PEC	3	0	0	3	**3**	40	60	100
5		Professional Elective – V	PEC	3	0	0	3	**3**	40	60	100
6		Open Elective – II	OEC	3	0	0	3	**3**	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT											
7	24CEI62	Concrete Technology	PCC	3	0	2	5	**4**	50	50	100
LABORATORY COURSES											
8	24CEP61	Irrigation and Environmental Drawing	ESC	0	0	2	2	**1**	60	40	100
MANDATORY COURSES											
9		Mandatory Course - III	MC	1	0	0	1	**0**	100	-	100
			TOTAL	**22**	**1**	**4**	**27**	**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	24MGT7n	Management Elective	HSMC	3	0	0	3	**3**	40	60	100
3	24CET71	Construction Engineering and Management	PCC	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	24CEI72	Estimation and Quantity Surveying	PCC	3	0	2	5	**4**	50	50	100
LABORATORY COURSES											
7	24CEP71	Structural Design and Drawing Laboratory	PCC	0	0	2	2	**1**	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE											
8	24CEP72	Design Project	EEC	0	0	4	4	**2**	60	40	100
9	24CEP73	Internship*	EEC	0	0	0	0	**1**	100	-	100
			TOTAL	**18**	**0**	**8**	**26**	**23**	**900**		

* The students should undergo Internship during the VI semester summer Vacation.

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SEMESTER VIII												
S.No	Course Code	Course Title	Category	Periods/ Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
EMPLOYABILITY ENHANCEMENT COURSE											
1	24CEP81	Project Work	EEC	0	0	16	16	**8**	60	40	100
			TOTAL	**0**	**0**	**16**	**16**	**8**	**100**		
Total Number of Credits to be Earned for the Award of the Degree = 167											
Note: HSMC – Humanities and Social Sciences including Management Courses, BSC – Basic Science Courses, ESC – Engineering Sciences Courses, PCC – Professional Core Courses, PEC – Professional Elective Courses, OEC – Open Elective Courses, EEC – Employability Enhancement Courses & MC – Mandatory Courses.											

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HUMANITIES, SOCIAL SCIENCE AND MANAGEMENT COURSES (HSMC)

S.No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot.		CA	ES	Tot.
1	24ENT19	Professional Communication	HSMC	3	0	0	3	**3**	40	60	100
2	24GET19	தமிழர்மரபு/ Heritage of Tamils	HSMC	1	0	0	1	**1**	40	60	100
3	24GET29	தமிழரும் தொழில்நுட்பமும்/Tamils and Technology	HSMC	1	0	0	1	**1**	60	40	100
4	24ENP29	Professional Communication Laboratory	HSMC	1	0	2	2	**1**	40	60	100
5	24GET49	Universal Human Values	HSMC	3	0	0	3	**3**	40	60	100
6		Management Elective	HSMC	3	0	0	3	**3**	40	60	100
7	24GET79	Professional Ethics	HSMC	3	0	0	3	**3**	40	60	100
		Total		**15**	**0**	**0**	**16**	**15**	-	-	-

BASIC SCIENCE COURSES (BSC)

S.No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot.		CA	ES	Tot.
1	24MAI19	Matrices and Calculus	BSC	2	1	2	5	**4**	50	50	100
2	24PHI07	Applied Physics	BSC	3	0	2	5	**4**	50	50	100
3	24CHI07	Applied Chemistry	BSC	3	0	2	5	**4**	50	50	100
4	24MAI29	Probability and Statistics	BSC	2	1	2	5	**4**	50	50	100
5	24MAT36	Transforms and Complex Variables	BSC	3	1	0	4	**4**	40	60	100
6	24MAT46	Linear Algebra and Numerical Methods	BSC	3	0	0	3	**3**	40	60	100
		Total		**16**	**3**	**8**	**27**	**23**	-	-	-

ENGINEERING SCIENCES COURSES (ESC)

S.No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot.		CA	ES	Tot.
1	24CEI12	Engineering Graphics	ESC	2	0	3	5	4	50	50	100
2	24GEP17	Manufacturing Practices Laboratory	ESC	0	0	2	2	1	60	40	100
3	24CST26	Python Programming	ESC	3	0	0	3	3	40	60	100
4	24CSP26	Python Programming Laboratory	ESC	0	0	2	2	1	60	40	100
5	24CET32	Mechanics of Solids - I	ESC	3	1	0	4	**4**	40	60	100
6	24CET33	Fluid Mechanics and Hydraulics Engineering	ESC	3	0	0	3	**3**	40	60	100
7	24CET61	Water Resources and Irrigation Engineering	ESC	3	0	0	3	**3**	40	60	100
8	24CEP61	Irrigation and Environmental Drawing	ESC	0	0	2	2	**1**	60	40	100
		TOTAL		**14**	**1**	**9**	**24**	**20**	-	-	-

EMPLOYABILITY ENHANCEMENT COURSES (EEC)											
S.No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot.		CA	ES	Tot.
1	24SSP19	Aptitude and Coding Skill - I	EEC	0	0	2	2	1	100	-	100
2	24SSP29	Aptitude and Coding Skill - II	EEC	0	0	2	2	1	100	-	100
3	24SSP39	Advanced Aptitude and Coding Skill – III	EEC	0	0	2	2	1	100	-	100
4	24SSP49	Advanced Aptitude and Coding Skill – IV	EEC	0	0	2	2	1	100	-	100
5	24CEP55	Survey Camp	EEC	0	0	0	0	1	100	-	-
6	24CEP72	Design Project	EEC	0	0	4	4	2	60	40	100
7	24CEP73	Internship	EEC	0	0	0	0	1	100	-	100
8	24CEP81	Project Work	EEC	0	0	16	16	8	60	40	100
			Total	**0**	**0**	**32**	**32**	**16**	**-**	**-**	**-**

PROFESSIONAL CORE COURSES (PCC)											
S.No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
1	24CET11	Civil Engineers and society	PCC	3	0	0	3	**3**	40	60	100
2	24CEP11	Computer Aided Building Drawing	PCC	0	0	2	2	**1**	40	60	100
3	24CET21	Design Thinking	PCC	3	0	0	3	**3**	40	60	100
4	24CET22	Construction Materials, Techniques and Practices	PCC	3	0	0	3	**3**	40	60	100
5	24CEP21	Construction Materials Laboratory	PCC	3	0	0	3	**3**	40	60	100
6	24CET31	Highway and Railway Engineering	PCC	3	0	0	3	**3**	40	60	100
7	24CET34	Surveying	PCC	3	0	0	3	**3**	40	60	100
8	24CEP31	Applied Hydraulic laboratory	PCC	0	0	2	2	**1**	60	40	100
9	24CEP32	Highway Engineering Laboratory	PCC	0	0	2	2	**1**	60	40	100
10	24CEP33	Survey Engineering laboratory	PCC	0	0	2	2	**1**	60	40	100
11	24CEP34	Design Studio 1	PCC	0	0	2	2	**1**	100	-	100
12	24CET41	Mechanics of Solids - II	PCC	3	1	0	4	**4**	40	60	100
13	24CET42	Soil Mechanics	PCC	3	0	0	3	**3**	40	60	100
14	24CET43	Water Supply Engineering	PCC	3	0	0	3	**3**	40	60	100
15	24CEP41	Soil Mechanics Laboratory	PCC	0	0	2	2	**1**	60	40	100
16	24CEP42	Strength of Materials laboratory	PCC	0	0	2	2	**1**	60	40	100
17	24CEP43	Design Studio 2	PCC	0	0	2	2	**1**	100	-	100
18	24CET51	Design of Reinforced Concrete Structures	PCC	3	0	0	3	**3**	40	60	100
19	24CET52	Structural Analysis- I	PCC	3	1	0	4	**4**	40	60	100
20	24CET53	Foundation Engineering	PCC	3	0	0	3	**3**	40	60	100
21	24CET54	Wastewater Engineering	PCC	3	0	0	3	**3**	40	60	100
22	24CEP51	Environmental Engineering Laboratory	PCC	0	0	2	2	**1**	60	40	100
23	24CET62	Concrete Technology	PCC	3	1	0	4	**4**	40	60	100
24	24CET63	Design of Steel Structures	PCC	3	1	0	4	**4**	40	60	100
25	24CET64	Structural Analysis - II	PCC	3	0	0	3	**3**	40	60	100
26	24CEP62	Concrete Technology Laboratory	PCC	0	0	2	2	**1**	60	40	100
27	24CET71	Construction Engineering and Management	PCC	3	0	0	3	**3**	40	60	100
28	24CEI72	Estimation and Quantity Surveying	PCC	3	0	2	5	**4**	50	50	100
29	24CEP71	Structural Design and Drawing Laboratory	PCC	0	0	2	2	**1**	40	60	100
			Total	**51**	**4**	**24**	**79**	**66**	**-**	**-**	**-**

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PROFESSIONAL ELECTIVE COURSES (PEC): VERTICALS					
Vertical- I	**Vertical - II**	**Vertical - III**	**Vertical- IV**	**Vertical - V**	**Vertical – VI**
Structural Engineering	**Construction Engineering and Management**	**Environmental and Water resources Engineering**	**Geotechnical Engineering**	**Transportation and Urban Planning**	**Diversified Electives**
Pre-stressed Concrete	Maintenance and Rehabilitation of Structures	Air Pollution Management	Ground Improvement Techniques	Architecture and Town planning	AI in Civil Engineering
Bridge Engineering	Construction Safety Practices	Environmental Impact Assessment	Site Investigation and Soil Exploration	Pavement Engineering	Alternative Building Materials
Basics of Dynamics and Aseismic design	Introduction to smart cities	Industrial Waste Management	Engineering Behaviour Soil	Traffic Engineering and management	Building Information Modeling
Earthquake Engineering	Housing, Planning and Management	Municipal Solid Waste Management	Earth and Earth Retaining Structures	Housing planning and management	Drone Applications in Civil Engineering
Smart Materials and Smart Structures	Construction planning and Scheduling	Green Building	Engineering Geology	Introduction to Intelligent transport system	Disaster preparedness and mitigation
Prefabricated Structures	Advanced construction Techniques	Hydrology	Geo-Environmental Engineering	Urban planning and development	Global Climate Change
Advanced Concrete structures	Building Services	Groundwater engineering	Shallow Foundation	Public transport system	Remote sensing & GIS
Industrial Structures	Sustainable Construction	Integrated water resources management	Deep Foundation	Airport and Harbor Engineering	Total Station and GPS surveying

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Department	Civil Engineering	
Programme	B.E. Civil Engineering	

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot.		CA	ES	Tot.
VERTICAL 1: STRUCTURAL ENGINEERING											
1	24CEE01	Pre-stressed Concrete	PEC	3	0	0	3	**3**	40	60	100
2	24CEE02	Bridge Engineering	PEC	3	0	0	3	**3**	40	60	100
3	24CEE03	Basics of Dynamics and Aseismic design	PEC	3	0	0	3	**3**	40	60	100
4	24CEE04	Earthquake Engineering	PEC	3	0	0	3	**3**	40	60	100
5	24CEE05	Design of Off shore structures	PEC	3	0	0	3	**3**	40	60	100
6	24CEE06	Prefabricated Structures	PEC	3	0	0	3	**3**	40	60	100
7	24CEE07	Advanced Concrete structures	PEC	3	0	0	3	**3**	40	60	100
8	24CEE08	Industrial Structures	PEC	3	0	0	3	**3**	40	60	100
VERTICAL 2:CONSTRUCTION ENGINEERING AND MANAGWEMENT											
1	24CEE09	Maintenance and Rehabilitation of Structures	PEC	3	0	0	3	**3**	40	60	100
2	24CEE10	Construction Safety Practices	PEC	3	0	0	3	**3**	40	60	100
3	24CEE11	Introduction to smart cities	PEC	3	0	0	3	**3**	40	60	100
4	24CEE12	Housing, Planning and Management	PEC	3	0	0	3	**3**	40	60	100
5	24CEE13	Construction Planning and Scheduling	PEC	3	0	0	3	**3**	40	60	100
6	24CEE14	Advanced construction Techniques	PEC	3	0	0	3	**3**	40	60	100
7	24CEE15	Building Services	PEC	3	0	0	3	**3**	40	60	100
8	24CEE16	Sustainable Construction	PEC	3	0	0	3	**3**	40	60	100
VERTICAL 3: ENVIRONMENTAL AND WATER RESOURCES ENGINEERING											
1	24CEE17	Air Pollution Management	PEC	3	0	0	3	**3**	40	60	100
2	24CEE18	Environmental Impact Assessment	PEC	3	0	0	3	**3**	40	60	100
3	24CEE19	Industrial Waste Management	PEC	3	0	0	3	**3**	40	60	100
4	24CEE20	Municipal Solid Waste Management	PEC	3	0	0	3	**3**	40	60	100
5	24CEE21	Green Building	PEC	3	0	0	3	**3**	40	60	100
6	24CEE22	Hydrology	PEC	3	0	0	3	**3**	40	60	100
7	24CEE23	Groundwater Engineering	PEC	3	0	0	3	**3**	40	60	100
8	24CEE24	Integrated Water Resources Management	PEC	3	0	0	3	**3**	40	60	100
VERTICAL 4: GEOTECHNICAL ENGINEERING											
1	24CEE25	Ground Improvement Techniques	PEC	3	0	0	3	**3**	40	60	100
2	24CEE26	Site Investigation and Soil Exploration	PEC	3	0	0	3	**3**	40	60	100
3	24CEE27	Engineering Behaviour Soil	PEC	3	0	0	3	**3**	40	60	100
4	24CEE28	Earth and Earth Retaining Structures	PEC	3	0	0	3	**3**	40	60	100

S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot.		CA	ES	Tot.
5	24CEE29	Engineering Geology	PEC	3	0	0	3	**3**	40	60	100
6	24CEE30	Geo-Environmental Engineering	PEC	3	0	0	3	**3**	40	60	100
7	24CEE31	Shallow Foundation	PEC	3	0	0	3	**3**	40	60	100
8	24CEE32	Deep Foundation	PEC	3	0	0	3	**3**	40	60	100
VERTICAL 5: TRANSPORTATION AND URBAN PLANNING											
1	24CEE33	Architecture and Town planning	PEC	3	0	0	3	**3**	40	60	100
2	24CEE34	Pavement Engineering	PEC	3	0	0	3	**3**	40	60	100
3	24CEE35	Traffic Engineering and management	PEC	3	0	0	3	**3**	40	60	100
4	24CEE36	Housing planning and management	PEC	3	0	0	3	**3**	40	60	100
5	24CEE37	Introduction to Intelligent transport system	PEC	3	0	0	3	**3**	40	60	100
6	24CEE38	Urban planning and development	PEC	3	0	0	3	**3**	40	60	100
7	24CEE39	Public transport system	PEC	3	0	0	3	**3**	40	60	100
8	24CEE40	Airport and Harbor Engineering	PEC	3	0	0	3	**3**	40	60	100
VERTICAL 6: DIVERSIFIED ELECTIVES											
1	24CEE41	AI in Civil Engineering Global Climate Change Hydrology	PEC	3	0	0	3	**3**	40	60	100
2	24CEE42	Alternative Building Materials	PEC	3	0	0	3	**3**	40	60	100
3	24CEE43	Building Information Modeling	PEC	3	0	0	3	**3**	40	60	100
4	24CEE44	Drone Applications in Civil Engineering	PEC	3	0	0	3	**3**	40	60	100
5	24CEE45	Disaster preparedness and mitigation	PEC	3	0	0	3	**3**	40	60	100
6	24CEE46	Global Climate Change	PEC	3	0	0	3	**3**	40	60	100
7	24CEE47	Remote sensing & GIS	PEC	3	0	0	3	**3**	40	60	100
8	24CEE48	Total Station and GPS surveying	PEC	3	0	0	3	**3**	40	60	100
MANAGEMENT ELECTIVE											
1	24MGT01	Total Quality Management	HSMC	3	0	0	3	**3**	40	60	100
2	24MGT02	Principles of Management	HSMC	3	0	0	3	**3**	40	60	100
3	24MGT03	Engineering Economics and Financial Accounting	HSMC	3	0	0	3	**3**	40	60	100
4	24MGT04	Human Resource Management	HSMC	3	0	0	3	**3**	40	60	100
5	24MGT05	Industrial Management	HSMC	3	0	0	3	**3**	40	60	100
MANDATORY COURSE –I,II & III											
1	24MCP09	Yoga for Stress Management	MC	0	0	2	2	0	-	-	-
2	24MCT01	Constitution of India	MC	2	0	0	2	0	100	-	100
3	24MCT02	Environmental Science and Sustainability	MC	2	0	0	2	0	100	-	100
4	24MCT03	Introduction to Gender Studies	MC	2	0	0	2	0	100	-	100
5	24MCT04	Life Science for Engineers	MC	2	0	0	2	0	100	-	100
6	24MCT05	Industrial Safety	MC	2	0	0	2	0	100	-	100
7	24MCT06	Essence of Indian Knowledge System	MC	2	0	0	2	0	100	-	100
8	24MCT07	Elements of Literature	MC	2	0	0	2	0	100	-	100
9	24MCT08	Disaster Management	MC	2	0	0	2	0	100	-	100

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S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot.		CA	ES	Tot.
Automobile Engineering											
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
Biomedical Engineering											
9.	24BMO01	Basics of Biomedical Instrumentation	OEC	3	0	0	3	3	40	60	100
10.	24BMO02	Imaging Equipment's	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
Computer Science and Design											
15.	24CDO01	Animation Basics	OEC	3	0	0	3	3	40	60	100
16.	24CDO02	Data Visualization Techniques	OEC	3	0	0	3	3	40	60	100
Computer Science and Engineering											
17.	24CSO01	Programming in Java	OEC	3	0	0	3	3	40	60	100
18.	24CSO02	Fundamentals of Operating Systems	OEC	3	0	0	3	3	40	60	100
19.	24CSO03	Fundamentals of Database Systems	OEC	3	0	0	3	3	40	60	100
20.	24CSO04	Internet Programming	OEC	3	0	0	3	3	40	60	100
21.	24CSO05	Artificial Intelligence and Machine Learning	OEC	3	0	0	3	3	40	60	100
Computer Science and Engineering (IOT)											
22.	24IOO01	Internet of Thing and its Applications	OEC	3	0	0	3	3	40	60	100
23.	24IOO02	Sensors and Actuator Devices	OEC	3	0	0	3	3	40	60	100
24.	24IOO03	Mobile Application Development	OEC	3	0	0	3	3	40	60	100

Computer Science and Engineering (Cyber Security)											
25.	24CBO01	Fundamentals of Cyber security	OEC	3	0	0	3	3	40	60	100
26.	24CBO02	Penetration and Vulnerability Testing Techniques	OEC	3	0	0	3	3	40	60	100
27.	24CBO03	Basics of Digital Forensics	OEC	3	0	0	3	3	40	60	100
28.	24CBO04	Introduction to Ethical Hacking	OEC	3	0	0	3	3	40	60	100
29.	24CBO05	Malware analysis	OEC	3	0	0	3	3	40	60	100
Electrical and Electronics Engineering											
30.	24EEO01	Electrical Drives and Control	OEC	3	0	0	3	3	40	60	100
31.	24EEO02	Electrical Power Generation Systems	OEC	3	0	0	3	3	40	60	100
32.	24EEO03	Industrial Automation	OEC	3	0	0	3	3	40	60	100
33.	24EEO04	Electrical Instruments and Measurements	OEC	3	0	0	3	3	40	60	100
34.	24EEO05	Energy Conservation and Management	OEC	3	0	0	3	3	40	60	100
35.	24EEO06	Electrical Wiring, Estimation and Costing	OEC	3	0	0	3	3	40	60	100
36.	24EEO07	Fundamentals of Electrical Machinery	OEC	3	0	0	3	3	40	60	100
37.	24EEO08	Fundamentals of Electric Vehicle	OEC	3	0	0	3	3	40	60	100
Electronics and Communication Engineering											
38.	24ECO01	Consumer Electronics	OEC	3	0	0	3	3	40	60	100
39.	24ECO02	NANO Technology	OEC	3	0	0	3	3	40	60	100
40.	24ECO03	Fundamentals of Robotics	OEC	3	0	0	3	3	40	60	100
41.	24ECO04	Principles of Communication	OEC	3	0	0	3	3	40	60	100
42.	24ECO05	Electronics and Microprocessor	OEC	3	0	0	3	3	40	60	100
Information Technology											
43.	24ITO01	Block chain Technologies	OEC	3	0	0	3	3	40	60	100
44.	24ITO02	Cyber security Fundamentals	OEC	3	0	0	3	3	40	60	100
45.	24ITO03	Cloud computing Techniques	OEC	3	0	0	3	3	40	60	100
46.	24ITO04	Data Science using R	OEC	3	0	0	3	3	40	60	100
47.	24ITO05	Fundamentals of Business Intelligence	OEC	3	0	0	3	3	40	60	100
Mechanical Engineering											
48.	24MEO01	Basic Mechanical Engineering	OEC	3	0	0	3	3	40	60	100
49.	24MEO02	Solar Energy Utilization	OEC	3	0	0	3	3	40	60	100
50.	24MEO03	Selection of Materials	OEC	3	0	0	3	3	40	60	100
51.	24MEO04	Fibre Reinforced Plastics	OEC	3	0	0	3	3	40	60	100
52.	24MEO05	Rapid Prototyping	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

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S. No.	Course Code	Course Title	Category	Periods / Week				Credit	Max. Marks		
				L	T	P	Tot.		CA	ES	Tot.
1	24CEO01	Architectural Heritage of India	OEC	3	0	0	3	3	40	60	100
2	24CEO02	Elementary Civil Engineering	OEC	3	0	0	3	3	40	60	100
3	24CEO03	Modern Construction Materials	OEC	3	0	0	3	3	40	60	100
4	24CEO04	Water and Air Pollution Management	OEC	3	0	0	3	3	40	60	100
5	24CEO05	Water harvesting and Management	OEC	3	0	0	3	3	40	60	100

CREDIT SUMMARY										
Name of the Programme: B.E Civil Engineering										
CATEGORY	I	II	III	IV	V	VI	VII	VIII	TOTAL CREDITS	%
HSMC	4	2	-	3	-	-	6	-	15	8.98
BSC	8	8	4	3	-	-	-	-	23	13.77
ESC	5	4	7	-	-	4	-	-	20	11.97
PCC	4	6	10	13	14	11	8	-	66	39.52
PEC	-	-	-	3	6	6	3	-	18	10.78
OEC	-	-	-		3	3	3	-	9	5.39
EEC	1	1	1	1	1	-	3	8	16	9.58
MC	-	✓	-	-	✓	-	✓	-	-	-
Total	22	21	22	23	24	24	23	8	167	100

Total No. of Credits = 167
Total No. of Credits for Lateral Entry Students = 124

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

(Common to All Branches)

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

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

UNIT - I	UNDERSTANDING COMPARISONS AND CONTRASTS	(9)

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

UNIT - II	WRITING REPORTS AND PARAGRAPHS	(9)

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

UNIT - III	DESCRIBING THE PROCESS/PRODUCT	(9)

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

UNIT - IV	TRANSCODING AND RECOMMENDATIONS	(9)

Reading–Newspaper articles, Journal reports–and Nonverbal 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, Sci Tech Publications (India) Pvt.Ltd, 2012.
3 Aysha Viswamohan, English For Technical Communication, McGraw Hill Education, 2008.
4 KulbhusanKumar, 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	-	-
CO2	-	-	-	-	-	-	-	2	3	-	3	-	-
CO3	-	-	-	-	-	-	-	2	3	-	3	-	-
CO4	-	-	-	-	-	-	-	2	3	-	3	-	-
CO5	-	-	-	-	-	-	-	2	3	-	3	-	-
Avg.	-	-	-	-	-	-	-	2	3	-	3	-	-

1-low, 2-medium, 3-high

24CET11	CIVIL ENGINEERS AND SOCIETY	Category	L	T	P	C
		PCC	3	0	0	3

PREREQUISITE

A basic understanding of engineering principles, as well as familiarity with core Civil engineering ideas. Students should also be aware of environmental challenges and sustainability, as well as the ethical aspects involved in engineering methods.

OBJECTIVES:

- To discuss the impact of engineering on society and technological advancement.
- To explain the fundamental elements of building construction
- To discuss the role and importance of each infrastructure type in supporting societal functions and economic development.
- To understand the fundamental role of ethics in engineering practice and decision-making.
- To analyze the importance of reliability and safety in engineering design, operations, and maintenance.

UNIT - I	INTRODUCTION OF CIVIL ENGINEERING	(9)

Engineering – Definition – Engineering Education – Graduate Attributes – Engineering functions – Role and Responsibilities of Engineers – Early construction and development over time.

UNIT - II	FUNDAMENTALS OF CIVIL ENGINEERING	(9)

Introduction to Civil Engineering –Branches in Civil Engineering – Elements of Building Construction - General Requirement of Building, Elementary principles and basic requirements of a building Planning, Importance of Planning – Possible scopes for a career.

UNIT - III	NATIONAL PLANNING FOR CONSTRUCTION AND INFRASTRUCTURE DEVELOPMENT	(9)

Types of Infrastructures - Impact of infrastructural development on economy and environment of country – Position of Construction Industry five year plan outlays for construction – Current budget for infrastructure works - Role of Civil Engineer in Society.

UNIT - IV	ENGINEERING AS SOCIAL EXPERIMENTATION	(9)

The concept of profession – Importance of ethics in engineering – Role of codes of ethics – Professional responsibilities of engineers – Overview of ethical theories and applications -Engineering as Experimentation – Engineers as responsible Experimenters.

UNIT - V	SUSTAINABILITY	(9)

Reliability, risk and safety – Risk management – Engineering and the environment – Ethics and the environment – Sustainable Engineering – Sustainable Development Goal and Civil Engineering.

TOTAL: 45 PERIODS

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

COs	Course Outcome	Cognitive Level
CO1	Identify and explain key technological advancements in civil engineering from early construction methods to modern engineering practices	**Understand**
CO2	Develop a basic building plan that incorporates essential principles and requirements	**Apply**
CO3	Identify and apply the elements of building and importance of Civil Engineering towards nation's economy.	**Understand**
CO4	Identify and apply the ethical interest of stake in real world situation or Practice.	**Apply**
CO5	Develop a risk management plan for a hypothetical or real engineering project	**Apply**

TEXT BOOKS:

1. Dr. Shakuntala Acharya, "Civil Engineering Societal and Global Impact" All India Council for Technical Education (AICTE), New Delhi. November, 2023.
2. S S Bhavikati, "Basic Civil Engineering", New Age International (P) Limited Publishers, New Delhi, 2018

REFERENCES:

1. Rebecca Mirsky and John Schaufelberger, "Professional Ethics for the Construction Industry" RICS, USA, 2014.
2. Kim Strom Gottfried, "Straight Talk about Professional Ethics", Lyceum Books, 2nd Edition, 2014.
3. Kenneth K. Humphreys, "What Every Engineer Should Know about Ethics", CRC Press, 1999.
4. Richard Ashley, "The role of the civil engineer in society: Engineering ethics and major projects",
5. https://doi.org/10.1680/cien.2012.165.3.99, May 25, 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	-	-	-	-	3	3	3	3	-	3	-	2
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	**3**	**3**	**3**	**3**	-	**3**	-	
CO4	-	-	-	-	3	3	3	3	3	-	3	3	2
CO5	3	-	-	-	-	-	-	-	-	-	-	-	2
Avg.	**3**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**	**-**	**3**	**3**	**2**

1-low, 2-medium, 3-high

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

(common to all branches)

UNIT - I	LANGUAGE AND LITERATURE	(03)

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

UNIT - II	HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE	(03)

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

UNIT - III	FOLK AND MARTIAL ARTS	(03)

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

UNIT - IV	THINAI CONCEPT OF TAMILS	(03)

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

UNIT - V	CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE	(03)

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

Total : 15 Periods

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

Text Books :

1 Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)

2 Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukarasu) (Published by : International Institute of Tamil Studies)

Reference Books :

1 Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).

2 The Contribution of the Tamil to Indian Culture (Dr.M.Valarmathi) (Puplished by International Institute of Tamil Studies).

3 Keeladi – 'Sangam City Civilzation on the banks of river Vaigai; (Jointly Published by: Department of Archaeology & Tamilnadu Text Book and Educational Services Corporation, Tamilnadu)

4 Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by: The Author)

Mapping of COs with POs and PSOs

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

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

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

(அனைத்து துறைகளுக்கும் பொதுவானது)

அலகு – I	மொழி மற்றும் இலக்கியம்	(03)

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

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

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

அலகு – III	நாட்டுப் புறக்கலைகள் மற்றும் வீரவிளையாட்டுக்கள்	(03)

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

அலகு – IV	தமிழர்களின் திணைக் கோட்பாடுகள்	(03)

தமிழகத்தின் தாவரங்களும், விலங்குகளும் – தொல்காப்பியம் மற்றும் சங்கஇலக்கியத்தில் அகம் மற்றும் புறக்கோட்பாடுகள்–தமிழர்கள் போற்றிய அறக்கோட்பாடு- சங்கக்காலத்தில் தமிழகத்தில் எழுத்தறிவும் கல்வியும் – சங்ககால நகரங்களும் துறைமுகங்களும் – சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – கடல் கடந்த நாடுகளில் சோழர்களின் வெற்றி.

அலகு – V	இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு	(03)

இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறபகுதிகளில் தமிழ்பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில் சித்த மருத்துவத்தின் பங்கு கல்வெட்டுகள் கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்கள்களின் அச்சுவரலாறு.

Total : 15 Periods

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

Text Books :

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

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

Reference Books :

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

2 பொருநை – ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)

3 Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)

4 Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).

Mapping of COs with POs and PSOs

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

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

24MAI19	MATRICES 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 eigen vectors in reduction of quadratic form into canonical form.	Apply
CO2	Solve higher-order linear differential equations with constant and variable coefficients.	Understand
CO3	Analyse the center of curvature, circle of curvature and develop the evolutes.	Understand
CO4	Expand the Taylor series and calculate the extremum value for function of several variables.	Apply
CO5	Apply the divergence and curl in vector integral theorems of vector fields.	Apply

TEXT BOOKS:

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

REFERENCES:

1. Bali N. P and Manish Goyal, "Engineering Mathematics", Laxmi Publications Pvt Ltd., 7th Edition, 2020.
2. Dass H.K, "Advance Engineering Mathematics", S. Chand and company, 11th Edition, 2014.
3. Jain R.K. and Iyengar S.R.K," Advanced Engineering Mathematics", Narosa Publications, 8th Edition, 2012.
4. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley India, New Delhi, 10th Edition 2016.
5. https://archive.nptel.ac.in/courses/111/108/111108157/
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	PO11	PSO1	PSO2
CO1	3	3	3	3	2	1	-	-	-	-	1	2	-
CO2	3	3	3	3	2	1	-	-	-	-	1	2	-
CO3	3	3	3	3	2	1	-	-	-	-	1	2	-
CO4	3	3	3	3	2	1	-	-	-	-	1	2	-
CO5	3	3	3	3	2	1	-	-	-	-	1	2	-
Avg.	**3**	**3**	**3**	**3**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**2**	**0**

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 –electrorheological fluids (ERF)–magnetorheological fluids (MRF) – effect of temperature in fluids and its applications.

UNIT - V	MAGNETIC AND SUPERCONDUCTING MATERIALS	(9)

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

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

List of exercises/experiments:

1. Determine the 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, 11th Edition, 2018.
2. R.K. Gaur & S.L. Gupta, "Engineering Physics", Dhanpat Rai Publication, New Delhi, 7th Edition, 2014.

Reference Books :

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

Mapping of COs with POs and PSOs

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

1-low, 2-medium, 3-high

24CEI12	ENGINEERING GRAPHICS	Category	L	T	P	C
		ESC	3	0	2	4

PREREQUISITE

Student must have the basic knowledge of geometry, trigonometry and algebra, along with an introduction to fundamental engineering concepts. Students should also possess basic computer literacy and 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 apply BIS (Bureau of Indian Standards) conventions and specifications in technical drawings.
- To understand the true lengths and true inclinations of lines.
- To develop skills to create accurate projections of solid objects.
- To create the lateral surfaces of solids including prisms, pyramids, cylinders, and cones.
- To draw projections of simple and truncated solids accurately to represent their shapes in isometric and perspective views

UNIT - I	PLANE CURVES AND ORTHOGRAPHIC PROJECTION	(9)

Introduction on drafting instruments, BIS conventions and specifications, Lettering and Dimensions Conics - Construction of ellipse, Parabela and hyperbola by eccentricity method - Construction of cycloid construction of involutes- Drawing of tangents and normal to the above curves. Representation of Three Dimensional objects - General principles of orthographic projection - First angle projection.

UNIT - II	PROJECTION OF POINTS, LINES AND PLANE SURFACES	(9)

Projection of points and straight lines located in the first quadrant - 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	(9)

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	(9)

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	ISOMETRIC AND PERSPECTIVE PROJECTIONS	(9)

Principles of isometric projection - isometric scale - isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones. Perspective projection of prisms, pyramids and cylinders by visual ray method

List of Exercise/Experiments:

1. Study of basic tools, commands and coordinate system (absolute, relative, polar, etc.) used in 2D software.
2. Draw the conic curves and special curves by using AutoCAD.
3. Draw the front view, top view, side view of objects from the given pictorial view.
4. Draw the projections of straight lines.
5. Draw the projections of polygonal surface.
6. Draw the projections of simple solid objects.
7. Draw the sectional view and the true shape of the given section.
8. Draw the development of surfaces like prism, pyramids, cylinders and cone
9. Draw the isometric projections of simple solids, truncated prism and pyramids.
10. Draw the isometric projections of cylinder and cone.

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	Identify various types of plane curves and understand their geometric properties and equations.	Understand
CO2	Recognize the principles of projecting points onto various planes, including the frontal, horizontal, and profile planes	Understand
CO3	Demonstrate and construct projections of various solid shapes	Apply
CO4	Determine the true shape and true size of solid surfaces	Apply
CO5	Determine the principles and characteristics of isometric projection, including the method of representing 3D objects on a 2D plane	Understand

TEXT BOOKS:

1. M.S. Kumar, Engineering Graphics, D.D. Publications, Assam 2018.
2. K. V. Natarajan, A text book of Engineering Graphics, Dhanalakshmi Publishers, Chennai (2017).

REFERENCES:

1. Venugopal & V. Prabhu Raja, Engineering Graphics, New Age International (P) Limited, New Delhi, 15th Edition, 2018
2. K. R. Gopalakrishna, Engineering Drawing (Vol.I & II), Subhas Publications, Bengaluru, 1st Edition 2017.
3. B. Shah and B.C. Rana, Engineering Drawing, Pearson Education London, 2nd Edition, 2009.
4. N.D. Bhatt, Engineering Drawing, Charotar Publishing House, Gujarat, 46th Edition ,2003

Mapping of COs with POs and PSOs

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

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

24CEP11	COMPUTER AIDED BUILDING DRAWING	Category	L	T	P	C
		PCC	0	0	2	1

PREREQUISITE

Students should have a basic understanding of building design principles and technical drawings. Furthermore, a basic understanding of geometry and mathematics is essential to effectively develop and interpret architectural plans. Students should also have basic computer literacy.

OBJECTIVES:

- To gain foundational knowledge of AutoCAD software, including its interface, tools, and basic operations, enabling them to create precise technical drawings.
- To master essential AutoCAD commands to efficiently draw, modify, and manipulate objects within the software.
- To design and analyze a reading room structure featuring a reinforced concrete cement (R.C.C) flat roof, considering both functional and aesthetic aspects.
- To create and interpret the elevation view of a steel roof truss, understanding its application in large-scale building projects.
- To develop the ability to create realistic 3D perspective views of buildings, enhancing their visualization and presentation skills in architectural design.

List of Exercise/Experiments:

1. Study of Conventions & Symbols
2. Study of AutoCAD
3. Commands for AutoCAD
4. Cross section of Masonry wall Foundation
5. Cross section of RCC Isolated footing
6. Drawing of Building Components like Doors, and Windows
7. Lintel and Chajja
8. Reading room with R.C.C flat roof
9. Residential building with flat roof
10. Fully tiled gabled house
11. RCC framed building with partly flat and partly sloped roof
12. Elevation of steel roof truss
13. Workshop building
14. Perspective view of the building
15. C/S & plan of a RCC Dog legged stair case

TOTAL: 45 PERIODS

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

COs	Course Outcome	Cognitive Level
CO1	Identify the principles of planning and bye-laws used in building planning.	Understand
CO2	Draw layout, plan, elevation & sectional elevation of different types of building.	Apply
CO3	Draw plan, elevation and section of RCC framed structures.	Apply
CO4	Draw plan, elevation and section of factory buildings.	Apply
CO5	Develop 2D and 3D model of building	Apply

REFERENCES:

1. https://www.youtube.com/watch?v=zbO7RidXWNk&list=PL3sM1XFb3mRPSSgSYsSRqMv-Wvlakms9x
2. https://www.youtube.com/watch?v=6QKFgdDg5Yg&list=PLrOFa8sDv6jd0R3IzK-olrYadMkwsDG2g

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

1-low, 2-medium, 3-high

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

(Common to All Branches)

OBJECTIVES:

The Course will enable learners to:

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

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

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

UNIT - II	BASICS OF SHARE BASED CONCEPTS	(6)

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

UNIT - III	LOGICAL REASONING	(4)

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

UNIT - IV	VERBAL ABILITY	(7)

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

UNIT - V	C PROGRAMMING	(7)

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

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

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

TEXT BOOKS:

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

REFERENCES:

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

Mapping of COs with POs and PSOs

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

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

1-low, 2-medium, 3-high

24CET21	DESIGN THINKING	Category	L	T	P	C
		PCC	2	0	0	2

PRE-REQUISITE

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

Objectives

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

UNIT - I	FUNDAMENTALS OF DESIGN THINKING	(6)

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

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

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

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

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

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

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

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

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

TOTAL: 30 PERIODS

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

TEXT BOOKS:

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

REFERENCES:

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

Mapping of COs with POs and PSOs

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

1-low, 2-medium, 3-high

24CET22	CONSTRUCTION MATERILAS, TECHNIQUES AND PRACTICES	Category	L	T	P	C
		PCC	3	0	0	3

PREREQUISITE

The students must have a basic knowledge of physics and mathematics, particularly in mechanics and material properties, along with an understanding of fundamental engineering concepts like statics and structures.

OBJECTIVES:

- To use suitable construction materials for building construction.
- To plan different stages of construction techniques and identify suitable supporting structures based on the condition.
- To adopt different techniques of building construction as per requirement.
- To apply appropriate techniques used for sub structure construction.
- To identify and apply different techniques for super structure construction.

UNIT - I	STONES – BRICKS – CONCRETE BLOCKS	(9)

Stone as Building Material – Criteria for Selection – Tests on Stones – Deterioration and Preservation of Stone Work – Bricks – Classification – Manufacturing of Clay and Fly Ash Bricks – Tests on Bricks – Compressive Strength – Water Absorption – Efflorescence – Bricks for Special Use – Refractory Bricks – Cement, Concrete Blocks – Lightweight Concrete Blocks.

UNIT - II	PLANNING FOR CONSTRUCTION & SUPPORTING STRUCTURES	(9)

Various Stages in the Construction of the Project – Construction Coordination - Job Planning - Technical Planning – Scheduling - Site Clearance - Marking – Setting out foundations, Earthwork job Layout – Temporary Sheds – Setting Out Works – Centering & Shuttering - Slip Forms - Scaffolding – Shoring – De-shuttering Forms.

UNIT - III	CONSTRUCTION PRACTICES	(9)

Masonry – Stone Masonry – Bond in Masonry - Concrete Hollow Block Masonry – Flooring – Damp Proof Courses – Construction Joints – Movement and Expansion Joints– Pre Cast Pavements – Building Foundations – Basements – Fabrication and Erection of Steel Trusses – Frames – Braced Domes – Laying Brick - Arrangement of bonds in brick masonry— Weather and Water Proof – Roof Finishes –Acoustic and Fire Protection.

UNIT - IV	SUB STRUCTURE CONSTRUCTION	(9)

Techniques of Box Jacking – Pipe Jacking -Under Water Construction of Diaphragm Walls and Basement – Tunneling Techniques – Piling Techniques - Well and Caisson - Sinking Cofferdam – Cable Anchoring and Grouting-Driving Diaphragm Walls, Sheet Piles - Shoring for Deep Cutting – Well Points -Dewatering and Stand by Plant Equipment for Underground Open Excavation.

UNIT - V	SUPER STRUCTURE CONSTRUCTION	(9)

Launching Girders, Bridge Decks, Off Shore Platforms – Special Forms for Shells - Techniques for Heavy Decks – In-Situ Pre-Stressing in High Rise Structures, Material Handling - Erecting Light Weight Components On Tall Structures - Support Structure for Heavy Equipment and Conveyors –Erection of Articulated Structures, Braced Domes and Space Decks.

TOTAL: 45 PERIODS

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

COs	Course Outcome	Cognitive Level
CO1	Recognize basic information about construction materials.	Understand
CO2	Identify the purpose and functionality of different construction stages and supporting structures.	Understand
CO3	Implement appropriate construction techniques based on specific project requirements.	Apply
CO4	Apply appropriate techniques used for sub structure construction.	Apply
CO5	Use different techniques for super structure construction.	Apply

TEXT BOOKS:

1. Varghese, P.C., Building Materials, Prentice Hall India Learning Private Limited, Delhi, 2nd Edition, 2015
2. Purushothama Raj, P., Construction Techniques, Equipment's and Practices, Sri Krishna Hitech Publishing Company Pvt. Ltd, Chennai, 5th Edition, 2015.

REFERENCES:

1. Jagadish.K.S., Venktarama Reddy., B.V. and Nanjunda Rao, K.S., "Alternative Building Materials Technology", New Age International Private Limited, Bengaluru, 2nd Edition, 2017
2. Sharma, S.C., "Construction Equipment and Management", Khanna Publishers, New Delhi, 1st Edition, 2016.
3. Arora, S.P. and Bindra, S.P., "Building Construction, Planning Techniques and Method of Construction",
4. Dhanpat Rai and Sons, New Delhi, Reprint, 2010.
5. Deodhar, S.V., "Construction Equipment and Job Planning", Khanna Publishers, New Delhi, 4th edition, 2012.

Mapping of COs with POs and PSOs

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

1-low, 2-medium, 3-high

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

(Common to All Branches)

UNIT - I	WEAVING AND CERAMIC TECHNOLOGY	(03)

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

UNIT - II	DESIGN AND CONSTRUCTION TECHNOLOGY	(03)

Designing and Structural construction House & Designs in household materials during Sangam Age – Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram– Sculptures and Temples of Mamallapuram– Great Temples of Cholas and other worship places – Temples of Nayaka Period – Type study (Madurai Meenakshi Temple) –Thirumalai Nayakar 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 Tamil People nature.	-	-	-	-	-	3	3	-	2	-	3	1	-
CO2	Comprehend the construction technology, building materials in sangam Period and case studies.	-	-	-	-	-	3	3	-	2	-	3	2	2
CO3	Infer the metal process, coin and beads manufacturing with relevant archaeological evidence	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	Realize the agriculture methods, irrigation technology and pearl diving.	-	-	-	-	-	3	3	-	2	-	3	2	2
CO5	Apply the knowledge of scientific Tamil and Tamil computing.	-	-	-	-	-	3	3	-	2	-	3	-	-
	Average	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**-**	**2**	**-**	**3**	**2**	**2**

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

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

(**அனைத்து துறைகளுக்கும் பொதுவானது**)

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

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

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

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

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

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

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

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

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

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

Total : 15 Periods

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

	குறித்த புரிந்து கொள்ளலும் மற்றும் பயன்படுத்தலும்	

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

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

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

(Common to All Branches)

PREREQUISITE:

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

OBJECTIVES:

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

UNIT - I	ONE DIMESIONAL RANDOM VARIABLES	(9)

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

UNIT - II	TWO - DIMENSIONAL RANDOM VARIABLES	(9)

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

UNIT - III	TESTING OF HYPOTHESIS	(9)

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

UNIT - IV	DESIGN OF EXPERIMENTS	(9)

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

UNIT - V	STATISTICAL QUALITY CONTROL	(9)

Control charts for measurements ($\bar{X}$and R charts) – Control charts for C and P charts – Acceptance sampling for construction of an OC curve.

List of Exercise/Experiments (R Software):

1. Determine the probability by using binomial distribution.
2. Find the probability with the help of normal distribution.
3. Determine the correlation co-efficient between X and Y.
4. Calculate and plot the regression lines.
5. Test the significance of difference between experimental and theoretical values of the data by using chi-square test.
6. Examine the small samples using F distribution.
7. Analyze the data using Randomized Block Design (RBD).
8. Inspect the data using Latin Square Design (LSD).
9. Find the $\overline{X}$ 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, 4th edition, 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	2	-
CO2	3	3	3	3	2	-	-	-	1	-	1	2	-
CO3	3	3	3	3	2	-	-	-	1	-	1	2	-
CO4	3	3	3	3	2	-	-	-	1	-	1	2	-
CO5	3	3	3	3	2	-	-	-	1	-	1	2	-
Avg.	3	3	3	3	2	-	-	-	1	-	1	**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 in depth 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	PO 1	PO 2	PO 3	PO 4	PO5	PO 6	PO 7	PO8	PO9	PO1 0	PO1 1	PSO 1	PSO 2
CO1	3	2	2	-	1	-	3	1	-	-	2	2	-
CO2	3	2	2	-	1	-	3	1	-	-	2	2	-
CO3	3	2	2	-	1	-	2	1	-	-	2	1	-
CO4	3	2	2	-	1	-	2	1	-	-	2	-	-
CO5	3	2	2	-	1	-	2	1	-	-	2	2	-
Avg.	**3**	**2**	**2**	**-**	**1**	**-**	**2**	**1**	**-**	**-**	**2**	**2**	-

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, 2nd Edition, 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, 3rd Edition, 2013.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO 3	PO 4	PO5	PO6	PO 7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	2	3	-	-	-	-	-
CO2	2	-	-	-	-	-	-	2	3	-	-	-	-	-
CO3	2	-	-	-	-	-	1	2	3	-	-	-	-	-
CO4	2	-	-	-	-	-	1	-	3	-	-	-	-	-
CO5	2	-	-	-	-	-	1	-	3	-	-	-	-	-
Avg.	**2**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**3**	**-**	**-**	**-**	**-**	**-**

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

1-low, 2-medium, 3-high

24CEP21	CONSTRUCTION MATERIALS LABORATORY	Category	L	T	P	C
		PCC	0	0	2	1

PREREQUISITE

A basic understanding of material science and engineering principles, knowledge of construction materials and their properties, and familiarity with laboratory equipment and testing procedures are all required.

OBJECTIVES:

- To understand the fundamental knowledge of construction materials
- To familiar with standard quality laboratory testing procedures for common construction materials
- To apply relevant standards and codes during the testing of construction materials
- To recognize the importance of quality control in construction materials
- To develop problem-solving and critical-thinking skills by analyzing test results and making decisions about material suitability and quality in various construction

List of Exercise/Experiments:

1. Compressive Strength Test on Clay and Fly ash Bricks
2. Water Absorption Test on clay and Fly ash Bricks
3. Efflorescence Test on Clay and Fly ash Bricks
4. Specific Gravity of Cement
5. Consistency of Cement
6. Initial Setting time of Cement
7. Final Setting time of Cement
8. Soundness of Cement
9. Compressive Strength of Cement
10. Specific Gravity test on Fine Aggregate
11. Specific Gravity test on Coarse Aggregate
12. Water Absorption Test on Fine Aggregate
13. Water Absorption Test on Coarse Aggregate
14. Bulking of Sand
15. Compressive Strength Tests on Paver Blocks

TOTAL: 30 PERIODS

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

COs	Course Outcome	Cognitive Level
CO1	Identify the construction materials, including their properties and applications.	Understand
CO2	Adopt at performing standard quality laboratory tests for common construction materials, adhering to established procedures.	Apply
CO3	Apply relevant standards and codes in the testing and evaluation of construction materials.	Apply
CO4	Recognize the significance of quality control in maintaining construction material integrity and ensuring project success.	Understand
CO5	Develop informed decisions about material suitability and quality for diverse construction scenarios.	Apply

REFERENCES:

1. M.L Gambhir, Neha jamwal., "Building Construction Materials: Testing and Quality Control", Mc Grawhill Publishers New Delhi, 2022.
2. https://www.teksure.in/construction_materials_virtual_lab.php

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

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

(Common to All Branches)

OBJECTIVES:

The Course will enable the learners:

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

UNIT - I	NUMBERS AND SHARE BASED CONCEPTS	(6)

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

UNIT - II	BASICS OF WORK BASED CONCEPTS	(6)

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

UNIT - III	LOGICAL REASONING	(4)

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

UNIT - IV	VERBAL ABILITY	(7)

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

UNIT - V	PYTHON PROGRAMMING FUNDAMENTALS	(7)

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

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

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

TEXT BOOKS:

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

REFERENCES:

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

Mapping of COs with POs and PSOs

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