



Regulation 2023 Curriculum
2025 Batch

B.E (CIVIL ENGINEERING)

Vision and Mission of the Institution**Vision**

To be leading Institution in Academic excellence, Multidisciplinary Research, Innovation, Entrepreneurship and Industry relation in order to mould true citizens of the country

Mission

- ✚ To create innovative and vibrant young leaders in Engineering and Technology field for building India as a knowledge power by improving the teaching-learning process
- ✚ To enhance employability, entrepreneurship and to improve the research competence to address Societal needs.
- ✚ To generate engineering graduates who use knowledge as a powerful tool to drive societal transformation and inculcate in them ethical and moral values.

DEPARTMENT OF CIVIL ENGINEERING**Vision**

- ✚ To be a centre of learning in civil engineering education offering programs oriented with industry friendly curriculum meeting global standards to build ethical civil engineers embedded with research, entrepreneurship and excellence in academics to cater the needs of society.

Mission

- ✚ To establish a domain of valuable civil engineers with a pattern of discipline for the development of nation with ethical, environmental and economical concern.
- ✚ To produce civil engineers who will be able to induce knowledge-based transformation of the society.
- ✚ To attain knowledge-based society by imparting broad set of technical skills and attitude to meet the national standards.
- ✚ To provide technology based civil engineering services to meet the aspiration of the people and the industry.

Program Educational Objectives (PEOs)

The Civil Engineering graduate can

PEO 1: Gain knowledge and skills in Civil Engineering which will enable them to have a career and professional accomplishment in the public or private sector organizations.

PEO 2: Become Consultants, Entrepreneurs, develop processes and technologies to meet desired infrastructure needs of society and formulate solutions that are technically sound, economically feasible and socially acceptable.

PEO 3: Graduates will initiate an active programme for life long professional achievement and expertise through continuous development.

Program Outcomes

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes (PSOs)

PSO 1: Knowledge of Civil Engineering discipline

Demonstrate in-depth knowledge of Civil Engineering problems, apply independent judgment for synthesizing information and make innovative advances in a theoretical, practical and policy context.

PSO 2: Critical analysis of Civil Engineering problems and innovation

Critically analyse complex Civil Engineering problems, apply independent judgment for synthesizing information and make innovation advances in a theoretical, practical and policy context.

PSO 3: Conceptualization and evaluation of engineering solutions to Civil Engineering

Issues Conceptualize and solve Civil Engineering problems. Evaluate potential solutions and arrive at technically feasible, economically viable and environmentally sound solutions with due consideration of health, safety, and socio-cultural factors.

PEO / PO Mapping

PEOs	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
I	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
II	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
III	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Mapping of Course Outcome and Programme Outcome

Year	Sem	Course Name	POs												PSOs		
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
I YEAR	I SEMESTER	English For Engineers															
		Calculus for Engineers															
		Engineering Chemistry															
		Engineering Graphics															
		Heritage Of Tamil															
		C Programming															
		Communication Laboratory															
		Engineering Practices Laboratory															
		Career Enhancement Training I															
		Vocational Enhancement Training – I*															
	II SEMESTER	Probability theory and Statistics															
		Engineering Physics															
		Engineering Mechanics															
		Building Materials															
		Tamils & Technology															
		Proficiency in English															
		Python Programming															
		Basic Science Laboratory															
		Computer Aided Drafting Laboratory															
		Career Enhancement Training-II															
		Vocational Enhancement Training-II*															
II YEAR	III SEMESTER	Transform Techniques and Partial Differential Equations															
		Strength of Materials															
		Concrete Technology															

		Surveying and Levelling																
		Engineering Geology																
		Surveying Laboratory																
		Material Testing Laboratory																
		Design Studio I - Infrastructure																
		Employability Skills I																
		Vocational Enhancement Training-III*																
II YEAR	IV SEMESTER	Fluid and Applied Hydraulics																
		Water Supply and Irrigation Engineering																
		Highway and Railway Engineering																
		Soil Mechanics																
		Concrete Technology																
		Environmental Ecosystem and Sustainability																
		Mandatory Course I&																
		Hydraulics Engineering Laboratory																
		Soil Mechanics Laboratory																
		Design Studio II – Irrigation Structure																
		Employability Skills II																
		Vocational Enhancement Training IV*																
III YEAR	V SEMESTER	Design of Reinforced Concrete Elements																
		Structural Analysis I																
		Foundation Engineering																
		Construction Project Management																

		Professional Elective I																
		Professional Elective II																
		Structural Design and Drawing Laboratory																
		Survey Camp (1 week)																
		Employability Skills III																
		Vocational Enhancement Training V*																
	VI SEMESTER	Design of Steel Structures																
		Structural Analysis II																
		Professional Elective III																
		Professional Elective IV																
		Open Elective I*																
		Open Elective II*																
		Mandatory Course II ^{&}																
		Design Project																
		Design Studio – 3D Modelling																
		Employability Skills IV																
		Vocational Enhancement Training VI*																
IV YEAR	VII SEMESTER	Estimation and Quantity Surveying																
		Construction Equipment & Machinery																
		Professional Elective V																
		Professional Elective VI																
		Open Elective III*																
		Open Elective IV*																
		Project Work : Phase I																

		Internship Training (4 Weeks During VI Semester - Summer)															
	VIII SEMESTER	Project Work : Phase II															

1 – Low; 2 – Medium; 3 – High; ‘-’ – No correlation

SEMESTER-I								
S.No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
	U23IP101	Induction Program	MC	-	-	-	-	0
THEORY								
1	U23EN102	English For Engineers	HSMC	3	0	0	3	3
2	U23MA102	Calculus for Engineers	BSC	3	1	0	4	4
3	U23CY101	Engineering Chemistry	BSC	3	0	0	3	3
4	U23GE101	Engineering Graphics	ESC	3	0	1	5	4
5	U23HS102	Heritage of Tamils	HSMC	1	0	0	1	1
THEORY WITH LAB COMPONENT								
6	U23CS203	C Programming	ESC	2	0	2	4	3
PRACTICAL								
7	U23GE111	Engineering Practices Laboratory	ESC	0	0	4	4	2
EMPLOYABILITY ENHANCEMENT COURSES								
8	U23GE111	Career Enhancement Training I	EEC	2	0	4	4	1
9	U23VECxx	Vocational Enhancement Training-I*	VEC	0	0	2	2	1*
Total				18	1	14	33	21

*Vocational enhancement training is compulsory for all students. The credit earned will be recorded in the grade sheet and included in academic criteria for continuation and not considered for SGPA / CGPA calculation. Student shall select one of the courses from the list given under VEC.

SEMESTER-II								
S.No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MA204	Probability theory and statistics	BSC	3	1	0	4	4
2	U23PH102	Engineering Physics	BSC	3	0	0	3	3
3	U23CE201	Engineering Mechanics	ESC	3	2	0	5	3
4	U23CE202	Building Materials	ESC	3	0	0	3	3
5	U23HS202	Tamils &Technology	HSMC	1	0	0	1	1
THEORY WITH LAB COMPONENT								
6	U23EN202	Proficiency in English	HSMC	2	0	2	4	3
7	U23CS201	Python Programming	ESC	2	0	2	4	3
PRACTICAL								
8	U23BS111	Basic Science Laboratory	BSC	0	0	4	4	2
9	U23CE211	Computer Aided Drafting Laboratory	ESC	0	0	4	4	2
EMPLOYABILITY ENHANCEMENT COURSES								
10	U23EE212	Career Enhancement Training-II	EEC	2	0	0	2	1
11	U23VECxx	Vocational Enhancement Training-II*	VEC	0	0	2	2	1*
Total				19	2	14	36	25

*Vocational enhancement training is compulsory for all students. The credit earned will be recorded in the grade sheet and included in academic criteria for continuation and not considered for SGPA / CGPA calculation. Student shall select one of the courses from the list given under VEC.

SEMESTER-III								
S.No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23MA307	Transform Analysis and Partial Differential Equations	BSC	3	1	0	4	4
2	U23CE321	Strength of Materials	PCC	3	1	0	4	4
3	U23CE322	Concrete Technology	ESC	3	0	0	3	3
4	U23CE323	Surveying and Levelling	PCC	3	0	0	3	3
5	U23CE304	Engineering Geology	PCC	3	0	0	3	3
PRACTICAL								
7	U23CE311	Surveying Laboratory	PCC	0	0	4	4	2
8	U23CE312	Material Testing Laboratory	PCC	0	0	4	4	2
9	U23CE313	Design Studio I – Infrastructure	PCC	0	0	4	4	2
10	U23EE313	Employability Skills I	EEC	3	0	0	3	1
11	U23VECxx	Vocational Enhancement Training-III*	VEC	0	0	2	2	1*
Total				21	2	14	37	24

*Vocational enhancement training is compulsory for all students. The credit earned will be recorded in the grade sheet and included in academic criteria for continuation and not considered for SGPA / CGPA calculation. Student shall select one of the courses from the list given under VEC.

SEMESTER-IV								
S.No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23CE421	Fluid and Applied Hydraulics	PCC	3	0	0	3	3
2	U23CE422	Water Supply and Irrigation Engineering	PCC	3	0	0	3	3
3	U23CE423	Highway and Railway Engineering	PCC	3	0	0	3	3
4	U23CE404	Soil Mechanics	PCC	3	0	0	3	3
5	U23CY402	Environmental Ecosystem and Sustainability	BSC	2	0	0	2	2
PRACTICAL								
6	U23CE411	Hydraulics Engineering Laboratory	PCC	0	0	4	4	2
7	U23CE412	Soil Mechanics Laboratory	PCC	0	0	4	4	2
8	U23CE433	Design Studio II – Irrigation Structure	PCC	0	0	4	4	2
9	U23EE413	Employability Skills II	EEC	3	0	0	3	1
10	U23VECxx	Vocational Enhancement Training IV*	VEC	0	0	2	2	1*
MANDATORY COURSE								
11	U23MXXX	Mandatory Course I&	MC	2	0	0	2	0&
Total				19	0	14	33	21

*Vocational enhancement training is compulsory for all students. The credit earned will be recorded in the grade sheet and included in academic criteria for continuation and not considered for SGPA / CGPA calculation. Student shall select one of the courses from the list given under VEC.

[&]Mandatory Course-I is a Non-credit Course (Student shall select one course from the list given under MC-I)

SEMESTER-V								
S.No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23CE501	Design of Reinforced Concrete Elements	PCC	3	0	0	3	3
2	U23CE502	Structural Analysis I	PCC	3	0	0	3	3
3	U23CE503	Foundation Engineering	PCC	3	0	0	3	3
4	U23CE504	Construction Project Management	HSMC	3	0	0	3	3
5	U23CEPxx	Professional Elective I	PEC	3	0	0	3	3
6	U23CEPxx	Professional Elective II	PEC	3	0	0	3	3
PRACTICAL								
7	U23CE511	Structural Design and Drawing Laboratory	PCC	0	0	4	4	2
8	U23CE512	Survey Camp (1 week)	PCC	0	0	0	0	1
9	U23EE513	Employability Skills III	EEC	3	0	0	3	1
10	U23VECxx	Vocational Enhancement Training V*	VEC	0	0	2	2	1*
Total				21	0	6	27	22

*Vocational enhancement training is compulsory for all students. The credit earned will be recorded in the grade sheet and included in academic criteria for continuation and not considered for SGPA / CGPA calculation. Student shall select one of the courses from the list given under VEC.

SEMESTER-VI								
S.No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23CE601	Design of Steel Structures	PCC	3	0	0	3	3
2	U23CE602	Structural Analysis II	PCC	3	0	0	3	3
3	U23CEP02	Professional Elective III	PEC	3	0	0	3	3
4	U23CEP03	Professional Elective IV	PEC	3	0	0	3	3
5	U23CEO01	Open Elective I*	OEC	3	0	0	3	3
6	U23CEO02	Open Elective II*	OEC	3	0	0	3	3
PRACTICAL								
7	U23CE611	Design Project	PCC	0	0	4	4	2
8	U23CE612	Design Studio – 3D Modelling	PCC	0	0	4	4	2
9	U23EExxx	Employability Skills IV	EEC	3	0	0	3	1
10	U23VExxx	Vocational Enhancement Training VI*	VEC	0	0	2	2	1*
MANDATORY COURSE								
11	U23MCXXX	Mandatory Course II ^{&}	MX	2	0	0	2	0
Total				23	0	10	33	23

[&]Mandatory Course-II is a Non-credit Course (Student shall select one course from the list given under MC-II)

*Open Elective – I & II shall be chosen from the emerging technologies

*Vocational enhancement training is compulsory for all students. The credit earned will be recorded in the grade sheet and included in academic criteria for continuation and not considered for SGPA / CGPA calculation. Student shall select one of the courses from the list given under VEC

SEMESTER-VII								
S.No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23CE701	Estimation and Quantity Surveying	PCC	3	0	0	3	3
2	U23CE702	Construction Equipment &Machinery	PCC	3	0	0	3	3
3	U23CEP05	Professional Elective V	PEC	3	0	0	3	3
4	U23CEP06	Professional Elective VI	PEC	3	0	0	3	3
5	U23CEO03	Open Elective III*	OEC	3	0	0	3	3
6	U23CEO04	Open Elective IV*	OEC	3	0	0	3	3
PRACTICAL								
7	U23CE711	Project Work : Phase 1	EEC	0	0	4	4	2
8	U23CEI01	Internship Training (4 Weeks During VI Semester - Summer)	EEC	0	0	0	0	1
Total				18	0	4	22	21

*Open Elective – III & IV shall be chosen from the emerging technologies

SEMESTER-VIII								
S.No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
PRACTICAL								
1	U23CE811	Project Work : Phase II	EEC	0	0	16	16	8
Total				0	0	16	16	8

MANDATORY COURSES I&

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS
				L	T	P	
1.	U23MXxxx	Introduction to Women and Gender Studies	MC	3	0	0	0
2.	U23MXxxx	Elements of Literature	MC	3	0	0	0
3.	U23MXxxx	Film Appreciation	MC	3	0	0	0
4.	U23MXxxx	Disaster Risk Reduction and Management	MC	3	0	0	0
5.	U23MXxxx	Universal Human Values	MC	3	0	0	0
6.	U23MXxxx	Intellectual Property Rights	MC	3	0	0	0

&Mandatory Course are offered as a Non-credit Course (Student shall select one course from the list given above MC-I)

MANDATORY COURSES II&

S.NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS
				L	T	P	
1.	U23MXxxx	History of Science and Technology in India	MC	3	0	0	0
2.	U23MXxxx	Political and Economic thought for a humane society	MC	3	0	0	0
3.	U23MXxxx	State, Nation Building and Politics in India	MC	3	0	0	0
4.	U23MXxxx	Industrial Safety	MC	3	0	0	0
5.	U23MXxxx	Entrepreneurship Development	MC	3	0	0	0
6.	U23MXxxx	Design Thinking	MC	3	0	0	0

&Mandatory Course are offered as a Non-credit Course (Student shall select one course from the list given above MC-II)

PROFESSIONAL ELECTIVE COURSES: VERTICALS

Vertical I STRUCTURAL ENGINEERING	Vertical II CONSTRUCTION MANAGEMENT	Vertical III GEOTECHNICAL ENGINEERING	Vertical IV TRANSPORTATION ENGINEERING	Vertical V ENVIRONMENTAL & WATER RESOURCE ENGINEERING	Vertical VI DIVERSIFIED COURSES
Concrete Structures	Construction Techniques and Practices	Pile Foundation	Urban Planning and Management	Air Pollution and Management	3D printing in Civil Engineering
Repair and Rehabilitation of Structures	Construction Planning and Scheduling	Tunneling Engineering	Traffic Engineering and Management	Hydrology	Selection and Testing of Materials
Prestressed Concrete Structures	Building Services	Rock Mechanics	Transportation Engineering	Environmental Impact Assessment	GIS and Remote Sensing
Structural Design and Drawing	Advanced Construction Techniques	Geo-Environmental Engineering	Pavement Engineering	Environment, health and Safety	Energy Efficient Building
Prefabricated Structures	Digitalized Construction Lab	Earth Retaining Structures	Smart cities	Ground water Engineering	Building Information Modelling
Steel Concrete Composite Structures	Formwork Engineering	Ground Improvement Techniques	Metro Engineering	Municipal Solid Waste Management	AI in Civil Engineering
Structural Dynamics and Earthquake Engineering	Quality Control and Assurance	Soil Dynamics and Machine Foundations	Airports and Harbour Engineering	Environmental Engineering	Structural Health Monitoring

PROFESSIONAL ELECTIVE COURSES: VERTICALS**VERTICAL 1: STRUCTURAL ENGINEERING**

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	U23CEP11	Concrete Structures	PEC	3	0	0	3	3
2.	U23CEP12	Repair and Rehabilitation of Structures	PEC	3	0	0	3	3
3.	U23CEP13	Prestressed Concrete Structures	PEC	3	0	0	3	3
4.	U23CEP14	Structural Design and Drawing	PEC	3	0	0	3	3
5.	U23CEP15	Prefabricated Structures	PEC	3	0	0	3	3
6.	U23CEP16	Steel Concrete Composite Structures	PEC	3	0	0	3	3
7.	U23CEP17	Structural Dynamics and Earthquake Engineering	PEC	3	0	0	3	3

VERTICAL 2: CONSTRUCTION MANAGEMENT

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	U23CEP21	Construction Techniques and Practices	PEC	3	0	0	3	3
2.	U23CEP22	Construction Planning and Scheduling	PEC	3	0	0	3	3
3.	U23CEP23	Building Services	PEC	3	0	0	3	3
4.	U23CEP24	Advanced Construction Techniques	PEC	3	0	0	3	3
5.	U23CEP25	Digitalized Construction Lab	PEC	3	0	0	3	3
6.	U23CEP26	Formwork Engineering	PEC	3	0	0	3	3
7.	U23CEP27	Quality Control and Assurance	PEC	3	0	0	3	3

VERTICAL3: GEOTECHNICAL ENGINEERING

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	U23CEP31	Pile Foundation	PEC	3	0	0	3	3
2.	U23CEP32	Tunneling Engineering	PEC	3	0	0	3	3
3.	U23CEP33	Rock Mechanics	PEC	3	0	0	3	3
4.	U23CEP34	Geo-Environmental Engineering	PEC	3	0	0	3	3
5.	U23CEP35	Earth Retaining Structures	PEC	3	0	0	3	3
6.	U23CEP36	Ground Improvement Techniques	PEC	3	0	0	3	3
7.	U23CEP37	Soil Dynamics and Machine Foundations	PEC	3	0	0	3	3

VERTICAL 4: TRANSPORTATION ENGINEERING

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	U23CEP41	Urban Planning and Management	PEC	3	0	0	3	3
2.	U23CEP42	Traffic Engineering and Management	PEC	3	0	0	3	3
3.	U23CEP43	Transportation Engineering	PEC	3	0	0	3	3
4.	U23CEP44	Pavement Engineering	PEC	3	0	0	3	3
5.	U23CEP45	Smart cities	PEC	3	0	0	3	3
6.	U23CEP46	Metro Engineering	PEC	3	0	0	3	3
7.	U23CEP47	Airports and Harbour Engineering	PEC	3	0	0	3	3

VERTICAL 5: ENVIRONMENTAL & WATER RESOURCE ENGINEERING

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	U23CEP51	Air Pollution and Management	PEC	3	0	0	3	3
2.	U23CEP52	Hydrology	PEC	3	0	0	3	3
3.	U23CEP513	Environmental Impact Assessment	PEC	3	0	0	3	3
4.	U23CEP51	Environment, health and Safety	PEC	3	0	0	3	3
5.	U23CEP51	Ground water Engineering	PEC	3	0	0	3	3
6.	U23CEP51	Municipal Solid Waste Management	PEC	3	0	0	3	3
7.	U23CEP51	Environmental Engineering	PEC	3	0	0	3	3

VERTICAL 6: DIVERSIFIED COURSES

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	U23CEP61	3D printing in Civil Engineering	PEC	3	0	0	3	3
2.	U23CEP62	Selection and Testing of Materials	PEC	3	0	0	3	3
3.	U23CEP63	GIS and Remote Sensing	PEC	3	0	0	3	3
4.	U23CEP64	Energy Efficient Building	PEC	3	0	0	3	3
5.	U23CEP65	Building Information Modelling	PEC	3	0	0	3	3
6.	U23CEP66	AI in Civil Engineering	PEC	3	0	0	3	3
7.	U23CEP67	Structural Health Monitoring	PEC	3	0	0	3	3

OPEN ELECTIVE COURSES

(Students shall choose the open elective courses, such that the course contents are not similar to any other course contents/title under other course categories)

**OPEN ELECTIVE I AND II
(EMERGING TECHNOLOGIES)**

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.		Fundamentals of ML and AI	OEC	3	0	0	3	3
2.		Fundamentals of Data Science	OEC	3	0	0	3	3
3.		IoT Concepts and its Applications	OEC	3	0	0	3	3
4.		Augmented Reality and Virtual Reality	OEC	3	0	0	3	3
5.		English for Competitive Examinations	OEC	3	0	0	3	3
6.		NGOs and Sustainable Development	OEC	3	0	0	3	3
7.		Renewable Energy Technologies	OEC	3	0	0	3	3
8.		Urban Agriculture	OEC	3	0	0	3	3
9.		Drinking Water Supply and Treatment	OEC	3	0	0	3	3
10.		Nano Technology	OEC	3	0	0	3	3
11.		Functional Materials	OEC	3	0	0	3	3
12.		Waste Management	OEC	3	0	0	3	3
13.		Green Building	OEC	3	0	0	3	3
14.		Operations Research	OEC	3	0	0	3	3
15.		Algebra and Number Theory	OEC	3	0	0	3	3
16.		Linear Algebra	OEC	3	0	0	3	3
17.		Foundations of Entrepreneurship	OEC	3	0	0	3	3
18.		Team Building and Leadership Management for	OEC	3	0	0	3	3
19..		Creativity and Innovation in Entrepreneurship	OEC	3	0	0	3	3
20.		MOOC -Swayam/Coursera	OEC	3	0	0	3	3

OPEN ELECTIVE III and IV

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	U23CEO01	Green Buildings	OEC	3	0	0	3	3
2.	U23CEO02	Fire Safety Engineering	OEC	3	0	0	3	3
3.	U23CEO03	Nano Technology	OEC	3	0	0	3	3
4.	U23CEO04	Renewable energy Technologies	OEC	3	0	0	3	3

SCHEME OF CREDIT DISTRIBUTION- SUMMARY

S. No.	Category	Semester								Total Credits	
		I	II	III	IV	V	VI	VII	VIII	NIT	ANNA UNIVERSITY
1.	Humanities and Management Courses(HSMC)	5	4	-	-	3	-	-	-	12	12
2.	Basic Science Course (BSC)	7	9	4	2	-	-	-	-	22	25
3.	Engineering Science Course(ESC)	9	11	3	-	-	-	-	-	23	19
4.	Professional Core Course(PCC)	-	-	16	18	12	10	6	-	62	65
5.	Professional Elective Course(PEC)	-	-	-	-	6	6	6	-	18	18
6.	Open Elective Course(OEC)						6	6	-	12	12
7.	Employability Enhancement Skills/Internship/Project (EEC)	1	1	1	1	1	1	3	8	17	15
8.	Mandatory Course(MC)	--	--	--	✓	--	✓	--	--	--	--
9.	Vocational Enhancement Course (VEC)	✓	✓	✓	✓	✓	✓	--	--	--	--
Total		21	25	24	21	22	23	21	08	165	166

Category: BSC

U23EN102

SDG:4

EFFECTIVE ENGLISH FOR ENGINEERS

L	T	P	C
2	0	2	3

COURSE OBJECTIVES:

1. To enable learners of engineering and technology to develop their basic communication skills in English.
2. To acquire, command in both the respective skills (listening and reading) and the productive skills (writing and speaking) of the English language
3. To understand the key concepts of values, life skills and business communication, motivate students to look within and create a better version of themselves.
4. To focus on developing basic fluency in English, using vocabulary in the technical field, and strengthening reading and official written communication skills.
5. To use language efficiently in expressing their opinions via various media.

UNIT 1 INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION

Listening -Gap-Fill listening, Introducing a classmate (Activity) Speaking - Making telephone calls, Self Introduction. Reading - Reading brochures (technical context)- Social media messages relevant to technical contexts. Writing - Writing oneself, Writing Definition; Jumbled sentences. Grammar – Simple present tense, Present continuous, Present perfect, Present perfect continuous; Question types: Wh/ Yes or No/ and Tags; One-word substitution.

6

UNIT 2 NARRATION AND SUMMATION

Listening - Listening to documentaries, Interviews with celebrities. Speaking - Narrating personal experiences, Public speaking (Activity). Reading -Biographies, Newspaper reports. Writing - Paragraph writing, Report Writing (Project Survey Report). Grammar – Simple past tense, Past continuous, Past perfect, Past perfect continuous, Subject-Verb Agreement, Word forms (prefixes& suffixes), Error Correction.

6

UNIT 3 DESCRIPTION OF PROCESS/PRODUCT

Listening - Listen to product and process description - product advertisements. (Activity). Speaking – Picture description, Instructions to use the product: explaining uses and purposes .Reading – Reading gadget reviews: finding key information from a given text. Writing – Instructions, Process description. Grammar - Simple future tense, Future continuous, Future perfect, Future perfect continuous, Adjectives: Degrees of comparison, Compound Words.

6

UNIT 4**CLASSIFICATION AND RECOMMENDATIONS**

Listening –Listening to lectures & educational videos. Speaking – Small Talk: Discussing & making plans- Talking about tasks-talking about travel preparations. Reading –Reading articles (Activity), Data interpretation (Tables, pie chart and Bar chart). Writing –Memos to colleagues or friends, Recommendations. Grammar – Articles, Pronouns: Possessive & Relative pronouns, Cause and Effect **6**

UNIT 5**EXPRESSION**

Listening – Listening to discussions: panel discussions. Speaking –Making predictions, Talking about a given topic & giving opinion .Reading – Reading editorials, Reading excerpts of interviews with professionals (Activity) Writing – Creative Writing, Checklist. Grammar –Punctuation, Homonyms & Homophones, Simple, Compound & Complex Sentences. **6**

LAB COMPONENTS: 30 HOURS**USING DLM SOFTWARE**

S.NO	LIST OF EXPERIMENTS
1.	Listening; Conversation with friend.
2.	Self-Introduction
3.	Listening to telephonic Conversation
4.	Narrating personal experiences
5.	Listening to Lectures
6.	Presenting a given topic

COURSE OUTCOMES:

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

- CO1:** Remember the meanings of commonly used words and phrases in academic and professional contexts.
- CO2:** Understand the basics of listening and interpret key ideas and supporting details from academic and professional audio content.
- CO3:** Understand the fundamental grammatical structures and use them to interpret the meaning and function of sentences in technical and academic contexts.
- CO4:** Apply descriptive, narrative, and expository writing and speaking techniques to communicate effectively on various real-life and academic topics.

CO5: Analyse the structure and organization of academic and professional texts to interpret meaning effectively through reading skills

TEXT BOOKS:

1. English for Engineers & Technologists Orient Blacks wan Private Ltd. Department of English, Anna University, (2020 edition).
2. English for Science & Technology Cambridge University Press, 2021. Authored by Dr. Veena Selvam, Dr. Sujatha Priyadarshini, Dr. Deepa Mary Francis, Dr. KN.Shoba, and Dr. Lourdes Joevani, Department of English, Anna University.

REFERENCE BOOKS:

1. Technical Communication – Principles And Practices By Meenakshi Raman & SangeetaSharma, Oxford Univ. Press, 2016, New Delhi.
2. A Course Book on Technical English By Lakshmi Narayanan, Scitech Publications (India) Pvt. Ltd.
3. English For Technical Communication (With CD) By Aysha Viswamohan, Mcgraw HillEducation, ISBN : 0070264244.
4. Effective Communication Skill, Kulbhusan Kumar, R S Salaria, Khanna Publishing House.
5. Learning to Communicate – Dr. V. Chellammal, Allied Publishing House, New Delhi, 2003.

CO's-PO's & PSO's MAPPING															
C O	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C O1	1	-	-	-	-	-	1	-	2	3	-	2	-	-	-
C O2	1	-	-	-	-	-	1	-	3	3	-	3	-	-	-
C O3	1	-	-	-	-	-	1	-	3	3	-	3	-	-	-
C O4	1	-	-	-	-	-	2	-	3	3	-	2	-	-	-
C O5	1	-	-	-	-	-	2	-	3	3	-	3	-	-	-
Correlation levels: 1 – low 2 – medium 3 – high “-“ - no correlation															

COURSE DESIGNED BY	APPROVED BY
Dr. C. Alice Evangaline Jebaselvi- Professor/English	Dr.K.ParimalaGandhi Professor and Head/S&H
Name and Department	Name and Department of BoS Chairman

U23MA102

SDG:4

CALCULUS FOR ENGINEERS**Category: BSC**

L	T	P	C
3	1	0	4

COURSE OBJECTIVE:

- To develop the use of matrix algebra techniques that is needed by engineers for practical applications.
- To familiarize the students with differential calculus.
- To enlighten the students with functions of several variables. This is needed in many branches of engineering.
- To acquaint the knowledge of various techniques and methods of solving ordinary differential equations.
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their applications.

UNIT 1**MATRICES****9 +3**

Characteristic equation – Eigen values and Eigen vectors of a real matrix– Cayley –Hamilton theorem (Statement and applications only) –Orthogonal matrices –Diagonalization using orthogonal transformation of a symmetric matrix.

UNIT 2**DIFFERENTIAL CALCULUS****9 +3**

Limit of a function - Continuity - Derivatives - Differentiation rules (sum, product, quotient, chain rules) - Implicit differentiation - Applications: Maxima and Minima of functions of one variable.

UNIT 3**MULTIVARIABLE CALCULUS****9 +3**

Functions of two variables – Partial derivatives – Taylor's series for functions of two variables – Jacobian's – Constrained maxima and minima – Lagrange's multiplier and its applications.

UNIT 4**ORDINARY DIFFERENTIAL EQUATIONS****9 +3**

Linear differential equations of second order with constant coefficients - Linear differential Equations of second order with variable coefficients – Euler - Cauchy's linear differential equation - Method of variation of parameters for second order differential equations

UNIT 5**MULTIPLE INTEGRALS****9 +3**

Double integration with constant and variable limits - Region of integration- Area as double integral in Cartesian coordinates. Triple integral in Cartesian coordinates.

COURSE OUTCOMES:

At the end of the course, students would

CO1:Comprehend the concepts of Eigen values, Eigen vectors, limits, continuity, functions of several variables, Characteristics of ODE, double integration and region of integration for solving complex problems

CO2:Apply the Cayley-Hamilton theorem and diagonalizable symmetric matrices and reduce to quadratic forms, Use rules of differentiation to solve maxima and minima problems

CO3: Develop various techniques in solving ordinary differential equations for practical applications

CO4: Make use of differential and integral calculus tools in modeling problems

CO5:Utilize integrals to compute areas and volumes of solids and solve real-world problems involving multiple integration.

TOTAL: 60 PERIODS

TEXT BOOKS:

1. Grewal B.S., "Higher Engineering Mathematics", 44th Edition, Khanna Publishers, New Delhi, 2018.
2. Kreyszig E, "Advanced Engineering Mathematics ", 10th Edition, John Wiley, New Delhi, India, 2018.
3. James Stewart, "Calculus : Early Transcendentals", Cengage Learning, 8th Edition, New Delhi, 2015.

REFERENCES:

1. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co. Ltd., New Delhi, 11th Reprint, 2010.
2. James. G., "Advanced Modern Engineering Mathematics", 4th Edition, Pearson Education, New Delhi, 2016
3. Bali. N.P and Manish Goyal, "A Textbook of Engineering Mathematics", 10th Edition, Laxmi Publications Pvt. Ltd, 2021.
4. Anton. H, Bivens. I and Davis. S, " Calculus ", Wiley, 10th Edition, 2016
5. Jain. R.K. and Iyengar. S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 5th Edition, 2016.

CO's-PO's & PSO's MAPPING

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO3
CO1	3	3	3	1	1	-	-	-	-	-	-	-			
CO2	3	3	1	-	-	-	-	-	-	-	-	-			
CO3	3	3	2	-	1	-	-	-	-	-	-	-			
CO4	3	3	3	-	-	-	-	-	-	-	-	-			
CO5	3	3	2	1	-	-	-	-	-	-	-	-			
Correlation levels: 1 – low 2 – medium 3 – high “-“- no correlation															

COURSE DESIGNED BY	APPROVED BY
Dr.N.Vithya Professor/Mathematics	Dr.K.ParimalaGandhi Professor and Head/S&H
Name and Department	Name and Department of BoS Chairman

U23CY101	ENGINEERING CHEMISTRY	Category : BSC			
SDG: 9	(Common to AERO, AGRI, AIML, IT, FT & Civil)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

1. Learn boiler feed water requirements, and water treatment techniques.
2. To acquire knowledge about the preparation, properties and applications of polymers.
3. Understand the basic concepts of electrochemistry and its applications.
4. Learn corrosion control and protective techniques.
5. Acquire the knowledge about the fuels and properties of energy storage devices.

UNIT 1**WATER TECHNOLOGY****9**

Introduction - Sources of water - Impurities in water - Types of water –Hardness of water - Expression of hardness - Units of hardness - Estimation of hardness of water by EDTA method - Boiler troubles - Scale and sludge - Softening of water - External treatment method - Demineralization process - Internal treatment process – Carbonate, Phosphate and Calgon conditioning - Desalination by reverse osmosis method.

UNIT 2**POLYMERS****9**

Introduction: Classification of polymers – Natural and synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerization. Types: Addition, condensation and copolymerization and

mechanism of Addition polymerization (Free Radical). Preparation, properties and uses of Nylon (6,6 and 11) and Epoxy resin. Engineering application of plastics- PVC, PTFE and Bakelite.

UNIT 3 ELECTRO CHEMISTRY 9

Electrochemistry: Introduction - Cells - Representation of a galvanic cell - Reversible and irreversible cells - Electrode potential - Nernst equation - Reference electrode (Calomel electrode) - Electrochemical series and its applications – Battery: Introduction, Types of batteries- alkaline battery- lead storage battery - H₂ - O₂ fuel cell- applications. Construction of solar cells and E-Vehicle.

UNIT 4 CORROSION AND ITS CONTROL 9

Introduction - Chemical corrosion and Wet corrosion types only - Galvanic and differential aeration (Pitting, Crevice and Pipeline) - Corrosion- causes- factors- corrosion control - material selection and design aspects - electrochemical protection – sacrificial anode method and impressed current cathodic method- Cathodic protection method.

UNIT 5 FUELS AND COMBUSTION 9

Introduction - Classification of fuels - Requirements of a good fuel – **Combustion:** Principle of combustion - Calorific value - Gross and net calorific values - Explosive range - Spontaneous ignition temperature. Fuels: Solid fuels - Proximate analysis - Significance - Metallurgical coke - Otto-Hoffman byproduct method –

Liquid fuel: Manufacture of synthetic petrol - Bergius method - Knocking - Octane number - Cetane number - Gaseous fuel: Liquefied petroleum gas (LPG), Compressed natural gas (CNG).

COURSE OUTCOMES:

At the end of the course, students would

CO1: Recall the concept about water technology, engineering polymers, electrodes, corrosion and combustion of fuels.

CO2: Understand the boiler problems and categorize the polymers.

CO3: Classify plastics, batteries, corrosion, and the calorific value of fuels.

CO4: Apply enough knowledge of contemporary water softening, polymerization, fuel cell, electrochemical protection, and fuel manufacturing procedures.

CO5: Analyze the hardness of water using the EDTA technique and characterization of coal.

TOTAL: 45

PERIODS

TEXT BOOKS:

1. Jain P C and Monica Jain, “Engineering Chemistry”, 17th Edition, Dhanpat Rai Publishing Co., 2018.
2. Sivasankar B., “Engineering Chemistry”, Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2017.

REFERENCES:

1. B. S. Murty, P. Shankar, Baldev Raj, B. B. Rath and James Murday, “Textbook of nanoscience and nanotechnology”, Universities Press-IIM Series in Metallurgy and Materials Science, 2018.
2. O.G. Palanna, “Engineering Chemistry” McGraw Hill Education (India) Private Limited, 2nd Edition, 2017.

3. Friedrich Emich, "Engineering Chemistry", Scientific International Pvt, Ltd, New Delhi, 2017.
4. Shikha Agarwal, "Engineering Chemistry-Fundamentals and Applications", Cambridge University Press, Delhi, Second Edition, 2019.
5. R.D. Madan, "Modern Inorganic Chemistry", S. Chand, New Delhi, 2012
6. S.S. Dara, "A Textbook of Engineering Chemistry", S. Chand Publishing, 12th Edition, 2018.

CO's-PO's & PSO's MAPPING															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	3	-	-	2	-	-	2	-	-	-	-	1	-	-	-
CO2	3	-	-	2	2	-	2	-	-	-	-	2	-	-	-
CO3	3	-	-	2	2	-	2	-	-	-	-	2	-	-	-
CO4	3	-	-	2	3	-	2	-	-	-	-	3	-	-	-
CO5	3	-	-	2	3	-	2	-	-	-	-	3	-	-	-
CO6	3	-	-	2	2	-	2	-	-	-	-	2	-	-	-
Correlation levels: 1 – low 2 – medium 3 – high															

COURSE DESIGNED BY	APPROVED BY
Dr.K.ParimalaGandhi Profecesor & Head/S&H	Dr.K.ParimalaGandhi Profecesor & Head/S&H
Name and Department	Name and Department of BoS Chairman

U23GE101
SDG : 8

ENGINEERING GRAPHICS

Category : ESC
L T P C
2 0 2 4

COURSE OBJECTIVE:

1. Draw engineering curves of simple objects.
2. Draw the orthographic projection of solids and section of solids.
3. Draw the development of surfaces.
4. Draw the isometric projections of simple solids.

5. Model a simple object using a CAD software.

UNIT 1 **PLANE CURVES** **10**

Basic Geometrical constructions, Curves used in engineering practices: Conics -Construction of ellipse, parabola and hyperbola by eccentricity method - Construction of cycloid - Construction of involutes of circle - Drawing of tangents and normal to the above curves..

UNIT 2 **PROJECTION OF POINTS, LINES AND PLANES** **10**

Orthographic projection - principles - Principal planes - First angle projection -projection of points. Projection of straight lines - Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces).

UNIT 3 **PROJECTION OF SOLIDS** **10**

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids by rotating object method.

UNIT 4 **PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT** **10**

Sectioning of solids in simple vertical position - obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids - Prisms, pyramids cylinders and cones.

UNIT 5 **ISOMETRIC PROJECTIONS** **10**

Principles of isometric projection - isometric scale - Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders and cones.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Understand the engineering curves of simple objects.

CO2: Create drawings on orthographic views.

CO3: Use the knowledge of orthographic Projections of simple solids.

CO4: Draw the development of lateral surface of simple Solids.

CO5: Draw the isometric projection of simple plans and solids

CO6: Model a simple object using a CAD software.

TOTAL: 60 PERIODS

TEXT BOOKS:

- 1.Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.
2. Natrajan K.V., "A Text Book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.
3. Jeyapoovan T., "Engineering Graphics", Newdelhi Vikas Publishing House, 2007.

REFERENCES:

1. Parthasarathy N. S. and Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015.
2. Kulkarni D; Rastogi; Sarkar, "Engineering Graphics with AUTOCAD", Newdelhi Prentice Hall of India, 2009.

CO's-PO's & PSO's MAPPING															
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	3	1	2	-	2	-	-	-	-	3	-	2	2	2	3
CO 2	3	1	2	-	2	-	-	-	-	3	-	2	2	2	3
CO 3	3	1	2	-	2	-	-	-	-	3	-	2	2	2	3
CO 4	3	1	2	-	2	-	-	-	-	3	-	2	2	2	3
CO 5	3	1	2	-	2	-	-	-	-	3	-	2	2	2	3
Correlation levels: 1 – low 2 – medium 3 – high “-“ no correlation															

COURSE DESIGNED BY	APPROVED BY
Dr.S.Satheesh Kumar/Assistant Professor Aeronautical Engineering	Dr.M.Samuel Thanaraj Associate Professor & Head/Department of Civil Engineering
Name and Department	Name and Department of BoS Chairman

U23HS102

SDG:4

HERITAGE OF TAMILS

(Common to all Branches)

Category : HSMC

L	T	P	C
1	0	0	1

COURSE OBJECTIVE:

1. TO LEARN THE EXTENSIVE LITERATURE OF CLASSICAL TAMIL
2. TO REVIEW THE FINE ARTS HERITAGE OF TAMIL CULTURE
3. TO REALIZE THE CONTRIBUTION IN INDIAN FREEDOM STRUGGLE

UNIT 1**LANGUAGE AND LITERATURE****3**

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.

**UNIT 2 HERITAGE - ROCK ART PAINTINGS TO MODERN ART
 – SCULPTURE**
3

Bronze icons - Tribes and their handicrafts - Art of temple car making - - Massive Terracotta sculptures, Village deities, Making of musical instruments - Role of Temples in Social and Economic Life of Tamils.

UNIT 3 FOLK AND MARTIAL ARTS 3

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance. -

UNIT 4 THINAI CONCEPT OF TAMILS 3

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.

UNIT 5 CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE 3

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

COURSE OUTCOMES:

Upon completion of this course, student will be able to:

CO1: Remember the extensive literature of Tamil and its classical nature

CO2: Remember the heritage of sculpture, painting and musical instruments of ancient people

CO3: Understand Review on folk and martial arts of Tamil people

CO4: Understand Realization of Thinaï concepts, trade and victory of Chozha dynasty

CO5: Understand the contribution of Tamils in Indian freedom struggle, self-esteem movement and siddha medicine

TOTAL: 15 PERIODS

TEXT BOOKS:

1. HERITAGE OF TAMILS :VK PUBLICATIONS (PUBLISHERS OF SCIENCE AND ENGINEERING BOOKS)

REFERENCES:

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. Subaramanian, Dr. K. D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).

3 The Contributions of the Tamils to Indian Culture (Dr. M. Valarmathi) (Published by: International Institute of Tamil Studies)

4. Keeladi - ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

5. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

CO's-PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO2	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO3	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO4	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO5	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
Correlation levels: 1 – low 2 – medium 3 – high															

COURSE DESIGNED BY	APPROVED BY
Mr.A.Prabhakaran Assistant Professor/Tamil	Dr.K.ParimalaGandhi Profesor & Head/S&H
Name and Department	Name and Department of BoS Chairman

U23CS203

C PROGRAMMING

Category : BSC

SDG: 9

L	T	P	C
2	0	2	3

1. To learn the basic constructs of C Programming.
2. To learn arrays and strings concepts of C Programming
3. To learn functions and pointers in C and use pointers for storing data in the main memory efficiently.
4. To learn structures and union concepts of C Programming
5. To learn Applications of C programs

UNIT 1

BASICS OF C PROGRAMMING

6

Structure of a 'C' program - C Tokens: Constants, Variables – Data Types: Primitive Data Types, Type Definition, Operators and Expressions- Managing Input and Output operations

UNIT 2

CONTROL STATEMENTS AND ARRAYS

6

Decision Making: Branching statements, Looping statements- Arrays: Declaration, Initialization, One dimensional, Two dimensional, and Multidimensional arrays

UNIT 3	STRINGS, FUNCTIONS AND POINTERS	6
String: String operations – Function: Declaration, Definition, Parameter passing methods, Recursion – Pointers: Declaration, Definition, Pointers and Functions		
UNIT 4	STRUCTURE AND UNION	6
Structure and union - Nested structures – Pointer and Structures – Array of structures – Example Program using structures and pointers.		
UNIT 5	APPLICATION OF C PROGRAMMING	6
Applications – Advantages of C in civil Engineering – Analysis and Simulations of Design using C programming – Data Processing - Implementation of C in Design- Case Studies		

LIST OF EXPERIMENTS

1.	Programs using simple statements
2.	Programs using decision making statements
3.	Programs using looping statements
4.	Programs using one dimensional and two-dimensional arrays
5.	Programs using strings.
6.	Programs using user defined functions and recursive functions
7.	Programs using functions and pointers
8.	Sort the list of numbers using pass by reference.
9.	Generate salary slip of employees using structures and pointers
10.	Case Studies on Applications of C program in Civil Engineering Design

COURSE OUTCOMES:

At the end of the course, students would

CO1: Develop simple applications in C using basic constructs

CO2: Design applications using control statements and arrays

CO3: Develop and implement applications in C using functions and pointers and use pointers for storing data in the main memory efficiently.

CO4: Develop applications in C using structures and union.

CO5: Design Applications using C programming in Civil engineering

TOTAL: 45

PERIODS

TEXT BOOKS:

1.ReemaThareja, “Programming in C”,Oxford University Press, Second edition, 2016

2. Beecher K. Computational Thinking: A beginner's guide to Problem-solving and Programming. BCS Learning & Development Limited;2017.

REFERENCES:

1.Byron Gottfried. Programming With C. Fourth Edition, McGrawHill, 2018.

2.Paul Deital , Harvey deital, “C How to Program” , 8th Edition , Pearson,2016

3.Yashavant P. Kanetkar. “Let Us C”, BPB Publications, 2016.

4.Anita Goel and Ajay Mittal , “Computer Fundamentals and Programming in C”, Dorling Kindersley (India) Pvt.Ltd., Pearson Education in South Asia,2011.

CO's-PO's & PSO's MAPPING															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	3	3							1				1		
CO2	3	3	3					2	1				1		
CO3	3	3	1	1				2	1				1		
CO4	2	3	3	2	2		2		1						
CO5	2	3	3	2									1		
Correlation levels: 1 – low 2 – medium 3 – high															

COURSE DESIGNED BY	APPROVED BY
Dr.S.Pathur Nisha Professor/Department of Computer Science Engineering	Dr.S.Pathur Nisha Professor/Department of Computer Science Engineering
Name and Department	Name and Department of BoS Chairman

U23GE111 ENGINEERING PRACTICES LABORATORY

SDG : 8

(Common for all the branches)

Category : ESC

L	T	P	C
0	0	4	2

COURSE OBJECTIVE:

1. Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work.
2. Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts.
3. Assembling simple mechanical assembly of common household equipments; Making a tray out of metal sheet using sheet metal work.
4. Wiring various electrical joints in common household electrical wire work.

5. Soldering and testing simple electronic circuits; Assembling and testing simple electronic components

LIST OF EXPERIMENTS GROUP A (CIVIL & MECHANICAL)

PLUMBING WORK:
1.Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in household.
2.Preparing plumbing line sketches
3.Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components
WOOD WORK:
1. Sawing, 2. Planing
3. Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.
PART II MECHANICAL ENGINEERING PRACTICES
WELDING WORK:
4. Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.
5. Practicing gas welding.
BASIC MACHINING WORK:
6. (simple)Turning
7. (simple)Drilling.
8. (simple)Tapping
MACHINE ASSEMBLY PRACTICE:
9. Study of centrifugal pump
10.Study of air conditioner
SHEET METAL WORK:
Making of a square tray

COURSE OUTCOMES:

At the end of the course, students would

CO1:Fabricate carpentry components and pipe connections including plumbing works.

CO2:Use welding equipments to join the structures.

CO3:Carry out the basic assembling and machining operations; Make the models using sheet metal works.

CO4:Carry out basic home electrical works and appliances and to measure the electrical quantities.

CO5:Soldering the simple electronic circuits; Assemble the simple electronic devices.

TOTAL: 60 PERIODS

CO's-PO's & PSO's MAPPING

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO1	3	2			1	1	1					2	2	1	1
CO2	3	2			1	1	1					2	2	1	1
CO3	3	2			1	1	1					2	2	1	1
CO4	3	2			1	1	1					2	2	1	1
CO5	3	2			1	1	1					2	2	1	1
Correlation levels: 1 – low 2 – medium 3 – high “-“– no correlation															

COURSE DESIGNED BY	APPROVED BY
Mr.P.Siddharthan Assistant Professor/Department of Civil Engineering	Dr.M.Samuel Thanaraj Associate Professor and Head/Department of Civil Engineering
Name and Department	Name and Department of BoS Chairman

U23MA204

SDG:9

PROBABILITY THEORY AND STATISTICS

Category: BSC

L	T	P	C
3	1	0	4

COURSE OBJECTIVE:

- To develop a fundamental understanding of probability theory.
- To acquire the basic concept of discrete and continuous random variables.
- To equip students with the necessary skills to apply statistical tools in engineering problems.
- To understand the theory of hypothesis testing for both small and large samples, which is essential for solving real-life problems.
- To introduce the basic concepts and classifications of the design of experiments, which play a crucial role in statistical quality control.

UNIT 1 **BASICS OF PROBABILITY** **9 +3**

Probability –Axioms of probability – Conditional probability- Equally Likely - Mutually Exclusive events - Law of Total Probability – Baye’s theorem.

UNIT 2 **RANDOM VARIABLES** **9 +3**

Random Variables – Discrete and Continuous random variables – Probability Mass functions – Mean and Variance. Application of Random Variables in Data Handling in Engineering Filed

UNIT 3 **CORRELATION AND LINEAR REGRESSION** **9 +3**

Correlation – Karl Pearson’s correlation coefficients – Spearman’s Rank Correlation – Regression – Estimation of Regression line – Application: Measuring the influences between factors- Estimation of association among the variables.

UNIT 4 **HYPOTHESIS TESTING** **9 +3**

Large and Small sample tests: Student t-test - Single mean and difference of two means – F Test for Variance - Chi square test for goodness of fit. Application: Performance analysis- Comparative analysis – Quality testing

UNIT 5 **DESIGN OF EXPERIMENTS** **9 +3**

Analysis of Variance: One way and two-way classifications - Completely randomized design – Randomized block design. Application: Response Surface Methodology.

COURSE OUTCOMES:

At the end of the course, students would

CO1:Apply the concepts of probability to solve real-life problems.

CO2:Understand the fundamental principles of probability and statistics.

CO3: Analyze data relationships, evaluate correlation models, and interpret the results of hypothesis testing to support decision-making.

CO4: Analyze and interpret statistical results obtained from hypothesis testing and experimental designs to validate conclusions.

CO5:Apply one-way and two-way classification methods to analyze and interpret data from real-world experiments and practical scenarios.

TOTAL: 60 PERIODS

TEXT BOOKS:

1.Veerarajan, T, “Probability, Statistics, Random Processes and Queuing Theory ”, 1st Edition, Tata McGraw-Hill, New Delhi, 2019

2. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 8th Edition, 2015.

3. Gupta S.C, and Kapur V.K "Fundamentals of Applied Statistics", Sultan Chand, New Delhi, 4th Edition, 2014.

REFERENCES:

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

5. Veerarajan, T, "Probability, Statistics, Random Processes ", 3rd Edition, Tata McGraw-Hill, New Delhi, 2008.

6. Gupta S.C. and Kapoor V. K., " Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi, 12th Edition, 2020

CO's-PO's & PSO's MAPPING

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO3
CO1	3	3	3	2											
CO2	3	3	3	2											
CO3	3	3	3	2											
CO4	3	3	3	2											
CO5	3	3	3	2											
Correlation levels: 1 – low 2 – medium 3 – high “-“- no correlation															

COURSE DESIGNED BY	APPROVED BY
Ms.M.Gowri Manohari, Assistant Professor/Mathematics	Dr.K.Parimala Gandhi Professor & Head/S&H
Name and Department	Name and Department of BoS Chairman

U23PH102

SDG: 9

ENGINEERING PHYSICS

(B.E Civil, B.Tech-Food Tech & Agri)

Category : BSC

L	T	P	C
3	0	0	3

COURSE OBJECTIVE: The course aims to

1. Make the students effectively to achieve an understanding of properties of matter, types of modulus and problem solving using these concepts.
2. Understand the utilization of laser technology in various fields and its applications.
3. Introduce the basics of thermal physics and its applications.
4. Equipping the students to be successfully understood the importance of quantum physics and its application on microscope.
5. Motivate the students to understand formation of various materials and the internal structure of the materials.

UNIT 1**PROPERTIES OF MATTER****9**

Introduction – Elasticity – Stress-Strain Diagram and its uses - Factors affecting elastic modulus - Bending of beams - Cantilever: Theory and Experiment – Uniform: theory and experiment– Torsional stress and Deformations –Torsional Pendulum: Theory and Experiment - I-shaped girders - Applications.

UNIT 2**LASER****9**

Introduction – Laser – Principle of Spontaneous emission and Stimulated emission – Population Inversion-Pumping Methods – Einstein's A and B coefficients:derivation. Types of lasers – Nd-YAG, CO₂ laser and Semiconductor Laser – Industrial Applications.

UNIT 3**THERMAL PHYSICS****9**

Introduction – Transfer of Heat energy :Thermal conduction, convection and radiation –Heat conducts in solids –Thermal conductivity – Forbe's and Lee's disc method: Theory and Experiment – Applications: Heat Exchangers, Refrigerators, Ovens and Solar water heaters.

UNIT 4**QUANTUM PHYSICS****9**

Introduction - Black body radiation – Compton effect :Theory and Experimental verification – Matter waves – Schrödinger's wave equation: Time Independent and Time Dependent equations – Physical significance of wave function – Particle in a one-dimensional box - Microscope: Scanning Tunnelling microscope.

UNIT 5**CRYSTAL PHYSICS****9**

Introduction – Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – 'd' spacing in cubic lattice – Calculation of number of atoms per unit cell – Atomic radius – Coordination number – Packing factor for SC, BCC, FCC and HCP structures –Polymorphism and Allotropy.

COURSE OUTCOMES:

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

CO1: Realize the basics of properties of matter and its applications.

CO2: Understand the utilization of laser technology in various fields and its applications.

CO3: Gain the knowledge on thermal properties of materials and their applications in expansion joints and heat exchangers.

CO4: Understand the importance of quantum physics and its applications.

CO5: Realize the basics of crystals and their structures.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Bhattacharya, D.K. & Poonam, T. "Engineering Physics". Oxford University Press, 2015.
2. Gaur, R.K. & Gupta, S.L. "Engineering Physics". Dhanpat Rai Publishers, 2012.
3. Pandey, B.K. & Chaturvedi, S. "Engineering Physics". Cengage Learning India, 2012.

REFERENCES:

1. Halliday, D., Resnick, R. & Walker, J. "Principles of Physics". Wiley, 2015.
2. Serway, R.A. & Jewett, J.W. "Physics for Scientists and Engineers". Cengage Learning, 2010.
3. Palanisamy P.K. Engineering Physics. SCITECH Publications, 2011.
4. Kittle, C.; Introduction to solid state Physics:, Wiley, 2005.
5. Yaser Mani P. Engineering Physics I. Dhanam Publications, 2011.
6. Senthilkumar G. Engineering Physics I. VRB Publishers, 2011.

CO's-PO's & PSO's MAPPING															
C O	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
C O1	3	3	1	-	1	-	1	-	-	1	-	1	-	-	-
C O2	3	3	1	-	1	-	1	-	1	-	-	1	-	-	-
C O3	3	3	1	-	1	-	1	-	1	-	-	1	-	-	-
C O4	3	2	1	-	1	-	-	-	-	1	-	1	-	-	-
C O5	3	3	1	-	-	-	1	-	1	-	-	1	-	-	-
Correlation levels: 1 – low 2 – medium 3 – high “-“- no correlation															

COURSE DESIGNED BY	APPROVED BY
	Dr.K.ParimalaGandhi Professor and Head/S&H
Name and Department	Name and Department of BoS Chairman

U23CE201

ENGINEERING MECHANICS

Category : ESC

L	T	P	C
3	2	0	3

SDG: 9

COURSE OBJECTIVE:

1. To Learn the use scalar and vector analytical techniques for analyzing forces in Statically determinate structures.
2. To introduce the equilibrium of rigid bodies.
3. To study and understand the distributed forces, surface, loading on beam and intensity.
4. To learn the principles of friction, forces and to determine the apply the concepts of frictional forces at the contact surfaces of various engineering systems.
5. To develop basic dynamics concepts – force, momentum, work and energy.

UNIT 1**STATICS OF PARTICLES****12**

Introduction – Units and Dimensions – Laws of Mechanics – Lami's theorem, Parallelogram and triangular Law of forces (Statement Only) – Vectorial representation of forces – Vector operations of forces - additions, subtraction, dot product, cross product – Coplanar Forces – rectangular components – Equilibrium of a particle – Equivalent systems of forces – Principle of transmissibility.

UNIT 2**EQUILIBRIUM OF RIGID BODIES****12**

Free body diagram – Types of supports – Action and reaction forces (Beam only) – stable equilibrium – Conditions of equilibrium - Moments and Couples – Moment of a force about a point and about an axis.

UNIT 3**PROPERTIES OF SURFACES AND SOLIDS****12**

Centroids and centre of mass – Centroids sections - Rectangle, Circle, Triangle – T section, I section, - Angle section, Hollow section by using standard formula – Theorems of Pappus (Statement Only) - Area moments of inertia of plane areas – Rectangle, Circle, Triangle, T section, I section, Angle section, Hollow section by using standard formula – Parallel axis theorem and perpendicular axis theorem (Statement Only) – Polar Moment of Inertia – Radius of Gyration.

UNIT 4**DYNAMICS OF PARTICLES****12**

Introduction – Dynamics - Kinematics & Kinetics – Characteristics of Kinematics - Displacements, Velocity and acceleration, their relationship - Newton's laws of motion – Work Energy Equation– Impulse and Momentum.

UNIT 5**FRICTION****12**

Friction – Types of friction – Limiting friction – Coulomb's law of dry friction – Impending Motion – Angle of Repose – Body on a Rough inclined plane – Simple Contact Friction – Ladder Friction – Screw Friction – Belt Friction.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Illustrate the vectorial and scalar representation of forces and moments

CO2: Analyse the rigid body in equilibrium

CO3: To study and understand the distributed forces, surface, loading on beam and intensity

CO4: To learn the principles of friction, forces and to determine the apply the concepts of frictional forces at the contact surfaces of various engineering systems.

CO5: To develop basic dynamics concepts – force, momentum, work and energy.

TOTAL:60**PERIODS**

TEXT BOOKS:

1. Bhavikatti, S.S and Rajashekarappa, K.G., “Engineering Mechanics”, New Age International (P) Limited Publishers, 1998
2. Rajasekaran S and Sankarasubramanian G., “Engineering Mechanics Statics and Dynamics”, 3rd Edition, Vikas Publishing House Pvt. Ltd., 2005.

REFERENCES:

3. R.S.Khurmi. “A Text Book of Engineering Mechanics, S Chand Publishing, 2019.
2. Vela Murali, “Engineering Mechanics-Statics and Dynamics”, Oxford University Press, 2018.
3. P. JagetBabu, “Engineering Mechanics”, Pearson Education, India Ltd, 2016
4. N.Kottiswaran, “Engineering Mechanics”, Sri Balaji Publications, 2013.

CO's-PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	3	3	3	2	1	-	-	-	-	-	-	2	3	3	2
CO2	3	3	3	2	2	-	-	-	-	-	-	2	3	3	2
CO3	3	3	2	1	1	-	-	-	-	-	-	1	3	3	2
CO4	3	3	2	2	2	-	-	-	-	-	-	1	3	3	2
CO5	3	3	3	2	2	-	-	-	-	-	-	2	3	3	2
Correlation levels: 1 – low 2 – medium 3 – high															

COURSE DESIGNED BY	APPROVED BY
	Dr.M.Samuel Thanaraj HoD/Department of Civil Engineering
Name and Department	Name and Department of BoS Chairman

U23CE202

BUILDING MATERIALS

Category : ESC

SDG: 9

L	T	P	C
3	0	0	3

COURSE OBJECTIVE:

1. To introduce students to various materials commonly used in civil engineering construction and their properties.

UNIT 1

INTRODUCTION TO CONSTRUCTION MATERIAL

9

Basic Material for construction - Stone as building material – Criteria for selection – Tests on stones – Deterioration and Preservation of stone work – Bricks – Classification – Manufacturing of clay bricks – Tests on bricks – Compressive Strength – Water Absorption – Efflorescence – Bricks for special use.

UNIT 2 LIME – CEMENT – AGGREGATES 9

Lime – Preparation of lime mortar – Cement – Ingredients – Manufacturing process – Types and Grades – Properties of cement and Cement mortar – Hydration – Compressive strength – Tensile strength – Fineness– Soundness and consistency – Setting time – fine aggregates – river sand – crushed stone sand – properties – coarse Aggregates – Crushing strength – Impact strength – Flakiness Index – Elongation Index – Abrasion Resistance – Grading.

UNIT 3 CONCRETE 9

Concrete – Ingredients – Manufacturing Process – Batching plants –mixing – transporting – placing – compaction of concrete –curing and finishing – Ready mix Concrete – Mix specification - Concrete blocks – Lightweight concrete blocks – Introduction to Admixture

UNIT 4 TIMBER AND OTHER MATERIALS 9

Timber – Market forms – Industrial timber – Plywood – Veneer – Thermocol – Panels of laminates – Steel – Aluminum and Other Metallic Materials – Composition – Aluminium composite panel – Market forms – Mechanical treatment – Paints – Varnishes – Distempers – Bitumens and Tar.

UNIT 5 SUSTAINABLE MATERIALS 9

Glass – Ceramics – Sealants for joints – Fibre glass reinforced plastic – Clay products – Refractories – Bamboo - Tyre – Composite materials – Types – laminar composites – Fibre textiles– Geomembranes and Geotextiles for earth reinforcement – Application of Green Building Material

COURSE OUTCOMES:

At the end of the course, students would

CO1: Compare the properties of most common and advanced building materials.

CO2: Understand the typical and potential applications of lime, cement and aggregates

CO3: Know the production of concrete and also the method of placing and making of concrete elements.

CO4: Understand the applications of timbers and other materials.

CO5: Understand the importance of modern material for construction.

TOTAL: 45

PERIODS

TEXT BOOKS:

1. Varghese.P.C, "Building Materials", PHI Learning Pvt. Ltd, New Delhi, 2015.
2. Rajput. R.K., "Engineering Materials", S. Chand and Company Ltd., 2008.

REFERENCES:

4. Jagadish.K.S, "Alternative Building Materials Technology", New Age International, 2007.
2. Gambhir. M.L., & Neha Jamwal., "Building Materials, products, properties and systems", Tata McGraw Hill Educations Pvt. Ltd, New Delhi, 2012.
3. IS456 - 2000: Indian Standard specification for plain and reinforced concrete, 2011.
4. Punmia, B.C., "Soil Mechanics and Foundations", Laxmi Publications Pvt. Ltd. New Delhi, 2005

CO's-PO's & PSO's MAPPING															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	2	3	2	2	3	1	1	1	2	1	2	3	3	3	2
CO2	3	2	3	2	3	1	1	1	2	1	2	3	2	2	3
CO3	3	3	2	2	2	2	1	1	2	1	2	3	2	2	3
CO4	2	3	3	2	2	1	1	1	1	1	2	3	2	2	3
CO5	3	3	2	2	2	1	1	1	1	1	1	3	2	3	2
Correlation levels: 1 – low 2 – medium 3 – high															

COURSE DESIGNED BY	APPROVED BY
Dr.M.Samuel Thanaraj Associate Professor & Head /Department of Civil Engineering	Dr.M.Samuel Thanaraj Associate Professor & Head /Department of Civil Engineering
Name and Department	Name and Department of BoS Chairman

U23HS202

TAMILS & TECHNOLOGY

Category : BSC

SDG: 9

L	T	P	C
1	0	0	1

COURSE OBJECTIVE:

1. To learn the extensive literature of classical tamil
2. To review the fine arts heritage of tamil culture
3. To realize the contribution in Indian freedom struggle

UNIT 1**WEAVING AND CERAMIC TECHNOLOGY****3**

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

UNIT 2**DESIGN AND CONSTRUCTION TECHNOLOGY****3**

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 3 MANUFACTURING TECHNOLOGY 3

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 beads - Archeological evidences - Gem stone types described in Silappathikaram.

UNIT 4 AGRICULTURE AND IRRIGATION TECHNOLOGY 3

Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu 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 5 SCIENTIFIC TAMIL & TAMIL COMPUTING

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.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Understand the extensive literature of tamil and its classical nature (understand).

CO2: Understand the heritage of sculpture, painting and musical instruments of ancient people (understand)

CO3: Review on folk and martial arts of tamil people (understand)

CO4: Realization of thinaid concepts, trade and victory of Chola dynasty (understand).

CO5: Understand the contribution of tamils in Indian freedom struggle, self-esteem movement and Siddha medicine (understand)

TOTAL: 15 PERIODS

REFERENCES:

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. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
3. National The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: Interl Institute of Tamil Studies)
4. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
5. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
6. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book

CO's-PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	3	3	-	2	-	3			
CO2	-	-	-	-	-	-	3	3	-	2	-	3			
CO3	-	-	-	-	-	-	3	3	-	2	-	3			
CO4	-	-	-	-	-	-	3	3	-	2	-	3			
CO5	-	-	-	-	-	-	3	3	-	2	-	3			
Correlation levels: 1 – low 2 – medium 3 – high															

COURSE DESIGNED BY	APPROVED BY
Ms.A.Prabhakaran Assistant Professor/Tamil	Dr.K.ParimalaGandhi Professor and Head/S&H
Name and Department	Name and Department of BoS Chairman

U23EN202

PROFICENCY IN ENGLISH

Category : HSMC

SDG: 9

L	T	P	C
3	0	0	3

COURSE OBJECTIVE:

1. To engage learners in meaningful language activities to improve their LSRW skills
2. To identify personality traits and evolve as a better team player.
3. To develop analytical thinking skills for problem solving in communicative contexts
4. To demonstrate and understanding of job applications and interviews for internship and placements
5. To identify varied group discussion skills and apply them to take part in effective discussions in a professional context

UNIT 1

MAKING COMPARISONS

9

Listening – Listening to informal conversations (Activity) Speaking – Role Play - talking about experiences- talking about events in life- discussing past events Reading - Reading advertisements, Extensive Reading (Activity) Writing – Reading Comprehension, Writing a review/ summary of story/article. Grammar – Active voice & Passive voice, Prepositional phrases

UNIT 2

EXPRESSING CASUAL RELATIONS IN SPEAKING AND

9

Listening - Listening to longer technical speech, Listening to situation based dialogues Speaking – discussing news stories -talking about travel problems and procedures Reading - Reading longer technical texts, Reading a short story Writing - Personal letter (Inviting your friend), Congratulating

letter, Writing responses to complaints and adjustment letter Grammar - Infinitive and Gerunds, Modals

UNIT 3**PROBLEM SOLVING****9**

Listening – Listening to movie scenes/ documentaries depicting a technical problem and suggesting solutions (Activity). Speaking – Conversation skills with a sense of stress, intonation, pronunciation, Welcome address - vote of thanks Reading - Case Studies, news reports, reading passages with time limit Writing – Letter to the Editor, Short report on an event (field trip) Grammar – If conditional sentence, Phrasal Verbs

UNIT 4**REPORTING OF EVENTS AND RESEARCH****9**

Listening – Listening Comprehension based on news reports Speaking – Presenting an oral report, Talking about past, present and the future (Activity) Reading – Newspaper articles; Reading the job advertisements and the profile of the company Writing – Essay writing and its types (Compare & Contrast, Cause & Effect, Problem & Solution) Grammar – Reported Speech, Conjunctions

UNIT 5**THE ABILITY TO PUT IDEAS OR INFORMATION TO****9**

Listening – Listening to Presentations Speaking – Participating in a Role, Talking about environmental issues, Talking about everyday services (Activity) Reading – Note making skills – making notes from books

Writing – Email Writing, Biographical sketches of famous personalities, Grammar – Relative Clauses, Collocation, Fixed & Semi-fixed expressions

COURSE OUTCOMES:

At the end of the course, students would

CO1: Identify cause and effects in events, industrial processes through technical text

CO2: Understand and use tools of structured written communication

CO3: Identify individual personality types and role in a team

CO4: Understand the basics concepts of morality and diversity.

CO5: Present their opinion in a planned and logical manner, and draft effective resumes in context of job search

TOTAL: 45 PERIODS***TEXT BOOKS:***

1. English for Engineers & Technologists, Orient Blackswan Private Ltd. Department of English, Anna University, 2020
2. Barun.K.Mithra, Personality Development and Soft Skills, OUP India, 2019

REFERENCES:

5. Jack C. Richards, “Interchange, Student’s Book”, 4th Edition, Cambridge University Press, New York,

2017.

6. .Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., 2001, New Delhi
7. Muralikrishna & Sunitha Mishra, Communication Skills for Engineers and Scientists, PH Learning, new Delhi, 2009
4. Developing Communication Skills by Krishna Mohan, Meera Bannerji-Macmillan India Ltd. 1990, Delhi.
5. Shalini Varma, "Development of Life Skills and Professional Practice", 1st Edition, Vikas Publishing House Pvt. Ltd., 2014

CO's-PO's & PSO's MAPPING															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	1	1	-	3	1	-	2	-	-	-
CO2	-	-	-	-	-	1	1	-	3	2	-	2	-	-	-
CO3	-	-	-	-	-	2	2	-	3	2	-	3	-	-	-
CO4	-	-	-	-	-	2	2	-	3	1	-	2	-	-	-
CO5	-	-	-	-	-	1	2	-	3	3	-	3	-	-	-
Correlation levels: 1 – low 2 – medium 3 – high															

COURSE DESIGNED BY	APPROVED BY
Dr. C. Alice Evangaline Jebaselvi- Prof/English	Dr.K.Parimala Gandhi Profesor & Head/S&H
Name and Department	Name and Department of BoS Chairman

U23CS201
SDG: 9

PYTHON PROGRAMMING

Category : ESC

L	T	P	C
3	0	0	3

COURSE OBJECTIVE:

1. To understand and develop programs using Python.
2. To use the concepts of strings, control flow, data types in python programs.
3. To create programs using list, tuples, dictionaries, and files concept in Python.
4. To analyze image processing, networking and object-oriented programming in Python.
5. To create new ideas for problems in real world application using python.

UNIT 1 INTRODUCTION TO PYTHON PROGRAMMING

6

Introduction to Python Programming- Python Interpreter and Interactive Mode -Variables- Numerical types- Arithmetic operators and Expressions- Psuedo Code - Values and types: int, float, Boolean - Variables, Expressions, Statements -Illustrative Problems.

UNIT 2 DATA TYPES, CONTROL FLOW, STRINGS

8

Control Flow -conditional (if), Alternative (if-else), Chained conditional (if-elif-else)- Iteration: state, while, for, break, continue, pass - Strings: string slices, immutability, string functions and methods, string module, Regular expression, Pattern matching . - Illustrative Problems.

UNIT 3 LISTS, TUPLES DICTIONARIES AND FUNCTIONS

10

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters- Tuples: tuple assignment, tuple as return value- Dictionaries: operations and methods, advanced list processing – list comprehension. Functions and User Defined Functions: Simple and Mathematical Built-in Functions, Recursion -Illustrative Problems.

UNIT 4 FILES AND OOPS CONCEPT IN PYTHON

10

Files, Text files, reading and writing files-format operator; Files and exception handling -Introduction to Object Oriented Programming – Basic principles of Object Oriented Programming in Python – Class definition-Object Creation - Inheritance, Composition, Operator Overloading.

UNIT 5 IMAGE PROCESSING & NETWORKING WITH PYTHON AND APPLICATIONS

9

Basics of Image processing- Image File Formats – Introduction to Classic Image Processing Algorithm- Image Processing Tools-Fundamentals of Networking- Introduction to Python Sockets- Simple Client/Server Programming-Python Applications.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Explain the concepts of Python.

CO2: Use appropriate constructs to represent data

CO3: Write programs using different constructs in Python

CO4: Develop real world applications in image processing and networking.

CO5: Develop various simple programs for real world application using python.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Python Programming for Beginners: Skyrocket Your Code and Master Python in Less than a Week. Discover the Foolproof, Practical Route to Uncover Insider Hacks, Unlock New Opportunities, and Revolution Kindle Edition by Kit Jackson (Author), 31 May 2023
2. Introducing Python, 2nd Edition, by Bill Lubanovic, O'Reilly Media, Inc., 2019

REFERENCES:

8. Python Programming for Beginners, ISBN-13-979-8870875248, Narry Prince, 2023
9. Python Programming, West McKinney, ISBN-13-979-8870534817, 2023.
10. Python Quick Start Guide: The Simplified Beginner's Guide to Python Programming Using Hands-On Projects and Real-World Applications, by [Robert Oliver](#), ISBN-13-978-163610037, 2023.
11. Mastering Python Networking: Utilize Python packages and frameworks for network automation, monitoring, cloud, and management by Eric Chou, 2023

CO's-PO's & PSO's MAPPING															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	1	-	-	-	-	-	1	1	-	3	1	1	-
CO2	2	-	1	-	-	-	-	-	1	1	-	3	1	1	-
CO3	2	-	1	-	-	-	-	-	1	1	-	3	1	1	-
CO4	2	3	1	-	3	-	-	1	1	1	3	3	1	1	-
CO5	2	3	1	1	3	-	-	1	3	1	3	3	1	1	-
Correlation levels: 1 – low 2 – medium 3 – high															

COURSE DESIGNED BY	APPROVED BY
Dr.S.Pathur Nisha Professor/Department of Computer Science Engineering	Dr.S.Pathur Nisha Professor/Department of Computer Science Engineering
Name and Department	Name and Department of BoS Chairman

U23BS111
SDG: 4 & 9

BASIC SCIENCE LABORATORY

Category : BSC			
L	T	P	C
0	0	2	2

COURSE OBJECTIVE:

1. Learn the proper use of various kinds of physics laboratory equipment's
2. Understand how data can be collected, presented and interpreted in a clear and crisp manner.
3. Learn the problem solving skills related to physics principles and interpretation of experimental data.
4. Make the student to acquire practical skills in the determination of water quality parameters through volumetric analysis.
5. Develop the ability to explain the processes and to determine the amount of metal ion and strength of acids by instrumental analysis.

PHYSICS - LIST OF EXPERIMENTS (Any 5 Experiments)

1. Determination of rigidity modulus – Torsion pendulum
2. Determination of Young's modulus - Non uniform bending method.
3. Determination of Young's modulus - Uniform bending method.
4. Determination of thickness of a thin wire – Air wedge method.
5. Determination of the wavelength of the laser using grating .
6. Determination of Numerical Aperture and acceptance angle using Optical fibre.
7. Determination of velocity of sound and compressibility of liquid – Ultrasonic interferometer.
8. Determination of thermal conductivity of a bad conductor – Lee's Disc method.
9. Melde's string experiment.
10. Determination of Band gap of a semiconductor.

CHEMISTRY- LIST OF EXPERIMENTS (Any 5 Experiments)

1. Estimation of total, temporary and permanent hardness of water by EDTA method.
2. Estimation of alkalinity of the given water sample.
3. Determination of chloride content of water sample by Argentometric method.
4. Determination of strength of given hydrochloride acid using pH meter
5. Determination of DO content of water sample by Winkler's method.
6. Conduct metric titration strong acid Vs Strong Base.
7. Estimation of BOD of the given water sample.
8. Estimation of iron content of the given solution using potentiometer.
9. Estimation of Iron content by spectrophotometer.
10. Estimation of sodium present in water using flame photometer.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Apply Physics principles of elasticity to evaluate engineering properties of materials.

CO2: Analyze the physical principle involved in various instruments in acoustics, optics and thermal physics.

CO3: Characterize the quality of water samples with respect to their acidity, alkalinity and hardness.

CO4: Apply chemistry principles to evaluate DO, BOD, Iron content of the given samples.

CO5: Analyze the strength and amount of acids using pH, potentiometer, conductivity meter and the amount of chloride, sodium iron using Argentometric method and flame photometer for the given solution

TOTAL: 60 PERIODS

CO's-PO's & PSO's MAPPING															
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO1	3	2	1	1	-	-	1	-	1	-	-	-			
CO2	3	2	1	1	-	-	1	-	1	-	-	1			
CO3	3	2	1	1	-	-	1	-	1	-	-	-			
CO4	3	2	1	1	-	-	1	-	1	-	-	1			
CO5	3	2	-	1	-	-	1	-	1	-	-	1			
Correlation levels: 1 – low 2 – medium 3 – high															

COURSE DESIGNED BY	APPROVED BY
Dr.M.Kumaresan–Professor&Head/S&H & Dr.T.Jayaprakash-Professor/Physics	Dr.K.ParimalaGandhi Professor & Head/S&H
Name and Department	Name and Department of BoS Chairman

U23CE211 COMPUTER AIDED DRAFTING LABORATORY
SDG: 9

Category : ESC			
L	T	P	C
0	0	2	2

COURSE OBJECTIVE:

1. To Develop Skill to use Software to Create 2D and 3D Models
2. To apply basic concept to drawing, edit, dimension, hatching etc. to develop 2D & 3D Modeling
3. To make 3D modeling, along with detailing.

LIST OF EXPERIMENTS

1. Study of capabilities of software for Drafting and Modeling – Coordinate systems (absolute, relative, polar, etc.) – Creation of simple figures like polygon and general multi-line figures.
2. Drawing of a Title Block with necessary text and projection symbol.
3. Drawing of curves like parabola, spiral, involutes using Bspline or cubic spline
4. Drawing of front view and top view of simple solids like prism, pyramid, cylinder, cone, etc, and dimensioning.
5. Drawing front view, top view and side view of objects from the given pictorial views (eg. V- block, Base of a mix, Simple stool, Objects with hole and curves).
6. Drawing sectional views of prism, pyramid, cylinder, cone, etc
7. Drawing isometric projection of simple objects.
8. Drawing of a simple steel truss.
9. Drawing of a plan of residential building (Two bed rooms, kitchen, hall, etc.)
10. Creation of 3-D models of simple objects and obtaining 2-D multi-view drawings from 3-D model.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Able to choose scale factor and drawing standards

CO2: Ability to use the software packers for drafting and modeling

CO3: Ability to create 2D and 3D models of Engineering Components

CO4: Draw the various building components and also other structural Components.

CO5: Develop the working Drawings and recommend the details as per local bye laws.

TOTAL: 45 PERIODS

CO's-PO's & PSO's MAPPING															
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	3	-	-	-	2		-	1	-	-	-	1	3	2	-
CO2	3	2	-	-	2	3	-	2	3	2	-	2	3	2	2
CO3	3	2	-	-	2	3	-	2	3	2	-	2	3	2	2
CO4	3	2	-	2	2	3	-	1	3	2	-	2	3	2	2
CO5	3	2	-	2	2	3	-	2	3	2	-	2	3	2	2
Correlation levels: 1 – low 2 – medium 3 – high															

COURSE DESIGNED BY	APPROVED BY
Mr.P.Siddharthan Assistant Professor/Department of Civil Engineering	Dr.M.Samuel Thanaraj Associate Professor and Head/Department of Civil Engineering
Name and Department	Name and Department of BoS Chairman