

M.E. - STRUCTURAL 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

M.E. – Structural 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.
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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: (ME - STRUCTURAL 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.
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Mission of the Department / Programme: (ME - STRUCTURAL 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) :(ME - STRUCTURAL ENGINEERING)


The graduates of the Programme will be able to	
PEO 1	Professional Skill Development: Provide students to learn the detailed concepts of structural engineering for designing Civil Engineering structures.
PEO 2	Core Competence: Have successful career in different sectors of Structural Engineering Industry and technical institutes through life-long learning.
PEO 3	Interpersonal Skill and teamwork: Independently analyze socio-industrial problems and provide feasible solutions through critical thinking and research.

Programme Outcomes (POs) of ME –STRUCTURAL ENGINEERING

Program Outcomes (POs)	
M.E. Structural Engineering graduates will be able to:	
PO1	Conduct Investigations of complex Problems: An ability to independently carry out research / investigation and development work to solve practical problems.
PO2	Presentation Skill: An ability to write and present a substantial technical report / document
PO3	Scholarship of Knowledge: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
Program Specific Outcomes (PSOs)	
PSO1	Research Culture: Profound knowledge of Structural Engineering discipline, with an ability to evaluate, analyze and synthesize the existing and new knowledge in the field of structural design with wide applications.
PSO2	Core Values: Critically analyze complex Structural Engineering problems, apply independent judgment for synthesizing information and make innovative advances in a theoretical, practical and policy context.


		K.S.R. COLLEGE OF ENGINEERING (Autonomous) (Approved by AICTE & Affiliated to Anna University) K.S.R. Kalvi Nagar, Tiruchengode - 637 215							CURRICULUM PG R - 2024		
Department		Civil Engineering									
Programme		M.E – Structural Engineering									
SEMESTER I											
S.No	Course Code	Course Title	Category	Periods/ Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1	ST24T11	Matrix Methods of Structural Analysis	PCC	3	0	0	3	3	40	60	100
2	ST24T12	Advanced Concrete Structures	PCC	3	0	0	3	3	40	60	100
3	ST24T13	Structural Dynamics	PCC	3	0	0	3	3	40	60	100
4	MA24T12	Applied Mathematics for Structural Engineering	FC	3	0	0	3	3	40	60	100
5		Professional Elective – I	PEC	3	0	0	3	3	40	60	100
6		Professional Elective – II	PEC	3	0	0	3	3	40	60	100
LABORATORY COURSES											
7	ST24P11	Advanced Structural Engineering Laboratory	PCC	0	0	4	4	2	60	40	100
8	ST24P12	Technical Presentation - I	PCC	0	0	2	2	1	60	40	100
TOTAL				18	0	6	24	21	800		

SEMESTER II											
S.No	Course Code	Course Title	Category	Periods/ Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1	CN24T20	Research Methodology and Intellectual Property Rights	PCC	3	0	0	3	3	40	60	100
2	ST24T21	Theory of Elasticity and Plasticity	PCC	3	0	0	3	3	40	60	100
3	ST24T22	Advanced Steel Structures	PCC	3	0	0	3	3	40	60	100
4	ST24T23	Finite Element Method	PCC	3	0	0	3	3	40	60	100
5		Professional Elective – III	PEC	3	0	0	3	3	40	60	100
6		Professional Elective – IV	PEC	3	0	0	3	3	40	60	100
LABORATORY COURSES											
7	ST24P21	Advanced Computing Laboratory	PCC	0	0	4	4	2	60	40	100
8	ST24P22	Technical Presentation - II	PCC	0	0	2	2	1	60	40	100
TOTAL				18	0	6	24	21	800		

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Department		Civil Engineering									
Programme		M.E – Structural Engineering									
SEMESTER III											
S.No	Course Code	Course Title	Category	Periods/ Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
THEORY COURSES											
1	ST24T24	Design of Sub Structures	PCC	3	0	0	3	3	40	60	100
2		Professional Elective – V	PEC	3	0	0	3	3	40	60	100
3		Open Elective	OEC	3	0	0	3	3	40	60	100
LABORATORY COURSES											
4	ST24P31	Project Work Phase - I	EEC	0	0	12	12	6	60	40	100
5	ST24P32	Practical Training*	EEC	0	0	20	20	1	60	40	100
AUDIT COURSE											
6		Audit Course I	AC	2	0	0	2	0	100	-	100
TOTAL				11	0	32	43	16	600		

(* Four weeks during second semester vacation)

SEMESTER IV											
S.No	Course Code	Course Title	Category	Periods/ Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
LABORATORY COURSES											
1	ST24P41	Project Work Phase II	EEC	0	0	24	24	12	60	40	100
TOTAL				0	0	24	24	12	100		
TOTAL NO. OF CREDITS = 70											
TOTAL NUMBER OF CREDITS TO BE EARNED FOR AWARD OF THE DEGREE = 70											
Note: FC – Foundation Courses, AC – Audit Courses, PCC – Professional Core Courses, and PEC – Professional Elective Courses, EEC – Employability Enhancement Courses.											

	K.S.R. COLLEGE OF ENGINEERING (Autonomous) (Approved by AICTE & Affiliated to Anna University) K.S.R. Kalvi Nagar, Tiruchengode - 637 215		CURRICULUM PG R - 2024
	Department	Civil Engineering	
Programme	M.E – Structural Engineering		

PROFESSIONAL ELECTIVE COURSE (I & II)											
S.No	Course Code	Course Title	Category	Periods/ Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
LABORATORY COURSES											
1	ST24E01	Advanced Concrete Technology	PEC	3	0	0	3	3	40	60	100
2	ST24E02	Maintenance and Rehabilitation of Structures	PEC	3	0	0	3	3	40	60	100
3	ST24E03	Wind Analysis and Design of Structures	PEC	3	0	0	3	3	40	60	100
4	ST24E04	Optimization in Structural Design	PEC	3	0	0	3	3	40	60	100
5	ST24E05	Soil Structure Interaction	PEC	3	0	0	3	3	40	60	100
6	ST24E06	Storage Structures	PEC	3	0	0	3	3	40	60	100
7	ST24E07	Fracture Mechanics of Concrete Structures	PEC	3	0	0	3	3	40	60	100
8	ST24E08	Design and Construction of Ferrocement Structures	PEC	3	0	0	3	3	40	60	100
9	ST24E09	Design of Formwork	PEC	3	0	0	3	3	40	60	100
10	ST24E10	Non Linear Analysis of Structure	PEC	3	0	0	3	3	40	60	100

PROFESSIONAL ELECTIVE COURSE (III & IV)											
S.No	Course Code	Course Title	Category	Periods/ Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
1	ST24E11	Prestressed Concrete Structures	PEC	3	0	0	3	3	40	60	100
2	ST24E12	Special Concrete	PEC	3	0	0	3	3	40	60	100
3	ST24E13	Design of Steel Concrete Composite Structures	PEC	3	0	0	3	3	40	60	100
4	ST24E14	Experimental Techniques and Instrumentation	PEC	3	0	0	3	3	40	60	100
5	ST24E15	Industrial Structures	PEC	3	0	0	3	3	40	60	100
6	ST24E16	Earthquake Resistant Structures	PEC	3	0	0	3	3	40	60	100
7	ST24E17	Design of Tall Buildings	PEC	3	0	0	3	3	40	60	100
8	ST24E18	Design of Offshore Structures	PEC	3	0	0	3	3	40	60	100
9	ST24E19	Chemistry of Cement and Concrete	PEC	3	0	0	3	3	40	60	100
10	ST24E20	Soft Computing in Structural Engineering	PEC	3	0	0	3	3	40	60	100

PROFESSIONAL ELECTIVE COURSE (V)											
S.No	Course Code	Course Title	Category	Periods/ Week				Credit	Max. Marks		
				L	T	P	Tot		CA	ES	Tot
1	ST24E21	Stability of Structures	PEC	3	0	0	3	3	40	60	100
2	ST24E22	Corrosion of Steel in Concrete	PEC	3	0	0	3	3	40	60	100
3	ST24E23	Aseismic Design of Structures	PEC	3	0	0	3	3	40	60	100
4	ST24E24	Design of Bridges	PEC	3	0	0	3	3	40	60	100
5	ST24E25	Design of Plate and Shell Structures	PEC	3	0	0	3	3	40	60	100

AUDIT COURSES (SEMESTER – III)												
Sl. No.	Course Code	Course Name	Category	Hours/ Week				Credit	Maximum Marks			
				L	T	P	Tot		C	CA	ES	Total
THEORY COURSES												
1.	AX24A01	Disaster Management	AC	2	0	0	2	0	-	-	-	
2.	AX24A02	Value Education	AC	2	0	0	2	0	-	-	-	
3.	AX24A03	Constitution of India	AC	2	0	0	2	0	-	-	-	

FOUNDATION COURSES (FC)												
Sl. No.	Course Code	Course Name	Category	Hours/Week				Credit	Maximum Marks			
				L	T	P	Tot		C	CA	ES	Total
1.	MA24T12	Applied Mathematics for Structural Engineering	FC	3	0	0	3	3	40	60	100	

PROFESSIONAL CORE COURSES (PCC)												
Sl. No.	Course Code	Course Name	Category	Hours/Week				Credit	Maximum Marks			
				L	T	P	Tot		C	CA	ES	Total
1.	ST24T11	Matrix Methods of Structural Analysis	PCC	3	0	0	3	3	40	60	100	
2.	ST24T12	Advanced Concrete Structures	PCC	3	0	0	3	3	40	60	100	
3.	ST24T13	Structural Dynamics	PCC	3	0	0	3	3	40	60	100	
4.	ST24P11	Advanced Structural Engineering Laboratory	PCC	0	0	4	4	2	60	40	100	
5.	ST24P12	Technical Presentation - I	PCC	0	0	2	2	1	60	40	100	
6.	CN24T20	Research Methodology and IPR	PCC	3	0	0	3	3	40	60	100	
7.	ST24T21	Theory of Elasticity and Plasticity	PCC	3	0	0	3	3	40	60	100	
8.	ST24T22	Advanced Steel Structures	PCC	3	0	0	3	3	40	60	100	
9.	ST24T23	Finite Element Method	PCC	3	0	0	3	3	40	60	100	
10.	ST24P21	Advanced Computing Laboratory	PCC	0	0	4	4	2	60	40	100	
11.	ST24P22	Technical Presentation - II	PCC	0	0	2	2	1	60	40	100	
12.	ST24T24	Design of Sub Structures	PCC	3	0	0	3	3	40	60	100	

PROFESSIONAL ELECTIVE COURSES (PEC)											
Sl. No.	Course Code	Course Name	Category	Hours/Week				Credit	Maximum Marks		
				L	T	P	Tot		C	CA	ES
1.	ST24E01	Advanced Concrete Technology	PEC	3	0	0	3	3	40	60	100
2.	ST24E02	Maintenance and Rehabilitation of Structures	PEC	3	0	0	3	3	40	60	100
3.	ST24E03	Wind Analysis and Design of Structures	PEC	3	0	0	3	3	40	60	100
4.	ST24E04	Optimization in Structural Design	PEC	3	0	0	3	3	40	60	100
5.	ST24E05	Soil Structure Interaction	PEC	3	0	0	3	3	40	60	100
6.	ST24E06	Storage Structures	PEC	3	0	0	3	3	40	60	100
7.	ST24E07	Fracture Mechanics of Concrete Structures	PEC	3	0	0	3	3	40	60	100
8.	ST24E08	Design and Construction of Ferrocement Structures	PEC	3	0	0	3	3	40	60	100
9.	ST24E09	Design of Formwork	PEC	3	0	0	3	3	40	60	100
10.	ST24E10	Non Linear Analysis of Structure	PEC	3	0	0	3	3	40	60	100
11.	ST24E11	Prestressed Concrete Structures	PEC	3	0	0	3	3	40	60	100
12.	ST24E12	Special Concrete	PEC	3	0	0	3	3	40	60	100
13.	ST24E13	Design of Steel Concrete Composite Structures	PEC	3	0	0	3	3	40	60	100
14.	ST24E14	Experimental Techniques and Instrumentation	PEC	3	0	0	3	3	40	60	100
15.	ST24E15	Industrial Structures	PEC	3	0	0	3	3	40	60	100
16.	ST24E16	Earthquake Resistant Structures	PEC	3	0	0	3	3	40	60	100
17.	ST24E17	Design of Tall Buildings	PEC	3	0	0	3	3	40	60	100
18.	ST24E18	Design of Offshore Structures	PEC	3	0	0	3	3	40	60	100
19.	ST24E19	Chemistry of Cement and Concrete	PEC	3	0	0	3	3	40	60	100
20.	ST24E20	Soft Computing in Structural Engineering	PEC	3	0	0	3	3	40	60	100
21.	ST24E21	Stability of Structures	PEC	3	0	0	3	3	40	60	100
22.	ST24E22	Corrosion of Steel in Concrete	PEC	3	0	0	3	3	40	60	100
23.	ST24E23	Aseismic Design of Structures	PEC	3	0	0	3	3	40	60	100
24.	ST24E24	Design of Bridges	PEC	3	0	0	3	3	40	60	100
25.	ST24E25	Design of Plate and Shell Structures	PEC	3	0	0	3	3	40	60	100

EMPLOYABILITY ENHANCEMENT COURSES (EEC)											
Sl. No.	Course Code	Course Name	Category	Hours/Week				Credit	Maximum Marks		
				L	T	P	Tot		C	CA	ES
1.	ST24P31	Project Work Phase - I	EEC	0	0	12	12	6	60	40	100
2.	ST24P32	Practical Training	EEC	0	0	20	20	1	60	40	100
3.	ST24P41	Project Work Phase II	EEC	0	0	24	24	16	60	40	100

OPEN ELECTIVE COURSES (OEC)											
Sl. No.	Course Code	Course Name	Category	Hours/Week				Credit	Maximum Marks		
				L	T	P	Tot		C	CA	ES
1.	ST24O01	Principles of Sustainable Development	OEC	3	0	0	3	3	40	60	100
2.	ST24O02	Failure Analysis of Structures	OEC	3	0	0	3	3	40	60	100
3.	ST24O03	Smart Materials and Smart Structures	OEC	3	0	0	3	3	40	60	100

COURSE COMPONENT SUMMARY

S.No.	Category	Credits Per Semester				Credits Total	Percentage Credits
		I	II	III	IV		
1.	FC	3	-	-	-	3	4
2.	PCC	12	15	3	-	30	43
3.	PEC	6	6	3	-	15	22
4.	EEC	-	-	7	12	19	27
5.	OEC	-	-	3	-	3	4
TOTAL		21	21	16	12	70	100