

ACADEMIC CURRICULA

POST GRADUATE DEGREE PROGRAMMES

Master of Technology

(Choice Based Flexible Credit System)

Regulations 2021

Volume – 21 Curriculum



SRM

INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)

Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

12. M.Tech in Structural Engineering

12. (a) Department Vision Statement

Stmnt - 1	<i>To become a frontier in various fields of Civil Engineering education and research to meet national and global challenges in accordance with the societal needs.</i>
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12. (b) Department Mission Statement

Stmnt - 1	<i>To move up through international alliances and collaborative initiatives in civil engineering to achieve global excellence</i>
Stmnt - 2	<i>To accomplish a process to advance knowledge in a rigorous research environment related to civil engineering and allied disciplines</i>
Stmnt - 3	<i>To attract and build people in a rewarding and inspiring environment by fostering freedom, empowerment, creativity and innovation.</i>

12. (c) Program Education Objectives (PEO)

PEO - 1	<i>The post graduates will exhibit professional skills in multiple domains of structural engineering to deal with practical problems individually in native and global scenarios.</i>
PEO - 2	<i>The post graduates will show their individual innate skills to initiate and to carry out research investigations to cater to national and global needs</i>
PEO - 3	<i>The post graduates will have ability to disseminate their research and practical solutions to native and global communities through reports and documentations</i>
PEO - 4	<i>The post graduates will have ability to pursue for their higher research degrees at various levels</i>
PEO - 5	<i>The post graduates will have an applicative knowledge of modern developments in systems and software fields</i>

12. (d) Consistency of PEO's with Mission of the Department

	Mission Stmnt. - 1	Mission Stmnt. - 2	Mission Stmnt. - 3
PEO - 1	3	2	3
PEO - 2	3	3	3
PEO - 3	3	3	3
PEO - 4	3	2	2
PEO - 5	3	2	3

12. (e) PO – Program Outcomes

PO - 1	<i>An ability to independently carry out research /investigation and development work to solve practical problems.</i>
PO - 2	<i>An ability to write and present a substantial technical report/document.</i>
PO - 3	<i>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.</i>

12. (f) Consistency of PEO's with Program Outcomes (PO)

	Program Outcomes (PO)		
	1	2	3
PEO - 1	3	3	3
PEO - 2	3	3	2
PEO - 3	3	3	2
PEO - 4	3	3	2
PEO - 5	3	2	2

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

12. (g) Programme Structure: M.Tech in Structural Engineering

Professional Core Courses (C)						
Course Code	Course Title	Hours/Week			C	
		L	T	P		
21CEC501J ²	Matrix Computer Methods of Structural Analysis	2	0	2	3	
21CEC502T	Structural Dynamics	3	1	0	4	
21CEC503J	Advanced Design of Reinforced Concrete Structures	3	0	2	4	
21CEC504J	Finite Element Method and Applications	3	0	2	4	
21CEC505J ²	Advanced Steel Design	3	0	2	4	
21IPC501J ²	Research Methodology	2	1	2	4	
21CEC601T ¹	Case Studies	3	0	0	3	
Total Credits					26	

Professional Elective Courses (E)						
Course Code	Course Title	Hours/Week			C	
		L	T	P		
21CEE501T	Theory of Elasticity and Plasticity	3	0	0		
21CEE502T	Mechanics of Structural Composite Materials	3	0	0	3	
21MAE501T	Advanced Mathematical Techniques	3	0	0		
21CEE503T	Design of Steel-Concrete Composite Structures	3	0	0	3	
21CEE504T	Stability of Structures	3	0	0		
21CEE505T ³	Advanced Concrete Engineering	3	0	0		
21CEE506T	Design of Pre-stressed Concrete Structures	3	0	0		
21CEE507T	Aseismic Design of Structures	3	0	0	3	
21CEE508T	Conservation of Heritage Structures	3	0	0		
21CEE509T	Design of Reinforced Concrete Foundations	3	0	0		
21CEE510T	Analysis and Design of Structural Sandwich Panels	3	0	0	3	
21CEE511T	Pre-Fabricated Structures	3	0	0		
21CEE512T ³	Design of Tall Buildings	3	0	0		
21CEE513T	Design of Bridges	3	0	0	3	
21CEE514T	Design of Shells and Folded Plate Structures	3	0	0		
21CEE515J	Smart Structures	2	0	2		
21CEE516J	Machine learning application in Structural Design	2	0	2		
21CEE517J	Seismic Analysis and Disaster Preparedness using Data Analytics	2	0	2	3	
21CEE600T ¹	Journal Publication	0	0	0		
21CEE518J	Improving Structural safety and resilience Using AI techniques	2	0	2		
21CEE519J	Computer Aided Design and Programming	2	0	2	3	
21CEE520J	Predictive Structural Maintenance using IoT Techniques	2	0	2		
Total Credits					21	

Project Work, Internship In Industry / Higher Technical Institutions (P)						
Course Code	Course Title	Hours/Week			C	
		L	T	P		
21CEP501L	Specialization Project (OR)	0	0	40	20	
21CEP502L	Specialization Project	0	0	30	15	
21CEP503L	Domain Internship	0	0	10	5	
Total Credits					20	

Open Elective Courses (O)						
Course Code	Course Title	Hours/Week			C	
		L	T	P		
21CEO501T	Sustainable Materials and Construction Technology	3	0	0	3	
Total Credits					3	

Assessment by Open Book Examination (2)						
Course Code	Course Title	Hours/Week			C	
		L	T	P		
21CEC501J ²	Matrix Computer Methods of Structural Analysis	2	0	2	3	
21CEC505J ²	Advanced Steel Design	3	0	2	4	
21IPC501J ²	Research Methodology	2	1	2	4	

Course Delivery by online mode (3)						
Course Code	Course Title	Hours/Week			C	
		L	T	P		
21CEE505T ³	Advanced Concrete Engineering	3	0	0	3	
21CEE512T ³	Design of Tall Buildings	3	0	0	3	

100% assessment by the Department (1)						
Course Code	Course Title	Hours/Week			C	
		L	T	P		
21CEC601T ¹	Case Studies	3	0	0	3	
21CEE600T ¹	Journal Publication	0	0	0	3	

All elective courses may be studied under MOOC platform
¹ 100% assessment by the Department
² Assessment by Open Book Examination
³ Course Delivery through online mode

12. (h) Implementation Plan: M.Tech in Structural Engineering

Semester - I						
Code	Course Title	Hours/ Week				
		L	T	P	C	
21CEC501J ²	Matrix Computer Methods of Structural Analysis	2	0	2	3	3
21CEC502T	Structural Dynamics	3	1	0	4	
21CEC503J	Advanced Design of Reinforced Concrete Structures	3	0	2	4	
21IPC501J ²	Research Methodology	2	1	2	4	
21CEE501T	Theory of Elasticity and Plasticity	3	0	0		
21CEE502T	Mechanics of Structural Composite Materials	3	0	0	3	3
21MAE501T	Advanced Mathematical Techniques	3	0	0		
Total Credits					18	
Semester - II						
Code	Course Title	Hours/ Week				
		L	T	P	C	
21CEC504J	Finite Element Method and Applications	3	0	2	4	3
21CEC505J ²	Advanced Steel Design	3	0	2	4	
21CEE503T	Design of Steel-Concrete Composite Structures	3	0	0		
21CEE504T	Stability of Structures	3	0	0		
21CEE505T ³	Advanced Concrete Engineering	3	0	0		
21CEE506T	Design of Pre-stressed Concrete Structures	3	0	0		3
21CEE507T	Aseismic Design of Structures	3	0	0		
21CEE508T	Conservation of Heritage Structures	3	0	0		
21CEE509T	Design of Reinforced Concrete Foundations	3	0	0		
21CEE510T	Analysis and Design of Structural Sandwich Panels	3	0	0		
21CEE511T	Pre-Fabricated Structures	3	0	0		3
Total Credits					17	
Semester - III						
Code	Course Title	Hours/ Week				
		L	T	P	C	
	Open Elective	3	0	0	3	3
21CEE512T ³	Design of Tall Buildings	3	0	0		
21CEE513T	Design of Bridges	3	0	0		
21CEE514T	Design of Shells and Folded Plate Structures	3	0	0		3
21CEE515J	Smart Structures	2	0	2		
21CEE516J	Machine Learning Application in Structural Design	2	0	2		
21CEE517J	Seismic Analysis and Disaster Preparedness using Data Analytics	2	0	2		
21CEE600T ¹	Journal Publication	0	0	0		
21CEE518J	Improving Structural safety and resilience Using AI techniques	2	0	2		3
21CEE519J	Computer Aided Design and Programming	2	0	2		
21CEE520J	Predictive Structural Maintenance using IoT Techniques	2	0	2		
21CEC601T ¹	Case Studies	3	0	0	3	
Total Credits					15	
Semester - IV						
Code	Course Title	Hours/ Week				
		L	T	P	C	
21CEP501L	Specialization Project	0	0	40	20	20
(OR)						
21CEP502L	Specialization Project	0	0	30	15	
21CEP503L	Domain Internship	0	0	10	5	
Total Credits					20	

Students must register either 21CEP501L or 21CEP502L and 21CEP503L both in fourth semester

12. (i) Program Articulation Matrix: M.Tech in Structural Engineering

Course Code	Course Name	Programme Outcomes		
		1	2	3
21CEC501J	Matrix Computer Methods of Structural Analysis	3	3	2
21CEC502T	Structural Dynamics	3	3	2
21CEC503J	Advanced Design of Reinforced Concrete Structures	3	3	2
21CEC504J	Finite Element Method and Applications	3	3	2
21CEC505J	Advanced Steel Design	3	3	2
21CEC601T	Case Studies	3	3	2
21CEE501T	Theory of Elasticity and Plasticity	3	3	2
21CEE502T	Mechanics of Structural Composite Materials	3	3	2
21MAE501T	Advanced Mathematical Techniques	3	3	-
21CEE503T	Design of Steel-Concrete Composite Structures	3	3	2
21CEE504T	Stability of Structures	3	3	2
21CEE505T	Advanced Concrete Engineering	3	3	2
21CEE506T	Design of Pre-stressed Concrete Structures	3	3	2
21CEE507T	Aseismic Design of Structures	3	3	2
21CEE508T	Conservation of Heritage Structures	3	3	2
21CEE509T	Design of Reinforced Concrete Foundations	3	3	2
21CEE510T	Analysis and Design of Structural Sandwich Panels	3	3	2
21CEE511T	Pre-Fabricated Structures	3	3	2
21CEE512T	Design of Tall Buildings	3	3	2
21CEE513T	Design of Bridges	3	3	2
21CEE514T	Design of Shells and Folded Plate Structures	3	3	2
21CEE515J	Smart Structures	3	3	2
21CEE516J	Machine learning application in Structural Design	3	3	2
21CEE517J	Seismic Analysis and Disaster Preparedness using Data Analytics	3	3	2
21CEE600T	Journal Publication			
21CEE518J	Improving Structural safety and resilience Using AI techniques	3	3	2
21CEE519J	Computer Aided Design and Programming	3	3	2
21CEE520J	Predictive Structural Maintenance using IoT Techniques	3	3	2
	Open Elective			
21IPC501J	Research Methodology	3	2.6	
21CEP501L	Specialization Project			
21CEP502L	Specialization Project			
21CEP503L	Domain Internship			
	Program Average			

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation



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