

# **ACADEMIC CURRICULA**

## **UNDERGRADUATE DEGREE PROGRAMMES**

### **Bachelor of Technology**

**(B.Tech. - Four Years)**

**(Choice Based Flexible Credit System)**

**Regulations 2018**

**Volume - 1**

**(Revised in March 2019)**



**SRM INSTITUTE OF SCIENCE AND  
TECHNOLOGY**

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

**Kattankulathur, Kancheepuram District 603203, Tamil Nadu,  
India**

## 9. B.Tech. in Civil Engineering

### 9. (a) Mission of the Department

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

### 9. (b) Program Educational Objectives (PEO)

PEO - 1	Graduates will pursue higher studies in civil engineering, management and other related fields
PEO - 2	Graduates will perform as professional engineers in the fields of civil engineering
PEO - 3	Graduates will perform in diverse fields and gradually move into teamwork and leadership positions.
PEO - 4	Graduates will contribute to the development of the profession, nation and society

### 9. (c) Mission of the Department to Program Educational Objectives (PEO) Mapping

	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. - 3
PEO - 1	H	H	M
PEO - 2	H	M	H
PEO - 3	H	M	H
PEO - 4	H	M	H

H – High Correlation, M – Medium Correlation, L – Low Correlation

### 9. (d) Mapping Program Educational Objectives (PEO) to Program Learning Outcomes (PLO)

	Program Learning Outcomes (PLO)												Program Specific Outcomes (PSO)		
	Graduate Attributes (GA)														
	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO - 3
PEO - 1	H	H	H	H	H	L	L	L	L	L	L	L	H	H	H
PEO - 2	H	H	H	H	H	L	L	L	L	L	L	L	H	H	H
PEO - 3	L	L	L	L	M	M	L	H	H	H	H	H	M	M	M
PEO - 4	L	L	L	L	L	H	H	H	M	M	M	H	M	M	M

H – High Correlation, M – Medium Correlation, L – Low Correlation

#### PSO – Program Specific Outcomes (PSO)

PSO - 1	Graduates apply the knowledge of mathematical and physical sciences to solve problems in structural engineering, construction engineering management, geotechnical engineering, water resources engineering, environmental engineering and transportation engineering
PSO - 2	Graduates are capable of handling and applying modern engineering tools, software, Remote Sensing and GIS for solving civil engineering related problems
PSO - 3	Graduates are capable of working in teams in laboratory and industrial environment and carrying out major design projects

## 9. (e) Program Structure: B.Tech. in Civil Engineering

Humanities & Social Sciences including Management Courses (H)							
Course Code	Course Title	Hours/ Week					
		L	T	P	C		
18LEH101J	English	2	0	2	3		
18LEH102J	Chinese						
18LEH103J	French						
18LEH104J	German	2	0	2	3		
18LEH105J	Japanese						
18LEH106J	Korean						
18PDH101T	General Aptitude	0	0	2	1		
18PDH102T	Management Principles for Engineers	2	0	0	2		
18PDH103T	Social Engineering	2	0	0	2		
18PDH201T	Employability Skills & Practices	0	0	2	1		
Total Learning Credits							12

Engineering Science Courses (S)							
Course Code	Course Title	Hours/ Week					
		L	T	P	C		
18MES101L	Engineering Graphics and Design	1	0	4	3		
18MES102J	Basic Civil and Mechanical Engineering	3	1	2	5		
18EES102L	Electrical and Electronics Eng. Workshop	1	0	4	3		
18CSS101J	Programming for Problem Solving	3	0	4	5		
Total Learning Credits							16

Mandatory Courses (M)							
Code	Course Title	L	T	P	C		
18PDM101L	Professional Skills and Practices	0	0	2	0		
18PDM201L	Competencies in Social Skills	0	0	2	0		
18PDM203L	Entrepreneurial Skill Development						
18PDM202L	Critical and Creative Thinking Skills	0	0	2	0		
18PDM204L	Business Basics for Entrepreneurs						
18PDM301L	Analytical and Logical Thinking Skills	0	0	2	0		
18PDM302L	Entrepreneurship Management						
18LEM101T	Constitution of India	1	0	0	0		
18LEM102J	Value Education	1	0	1	0		
18GNM101L	Physical and Mental Health using Yoga	0	0	2	0		
18GNM102L	NSS						
18GNM103L	NCC	0	0	2	0		
18GNM104L	NSO						
18LEM109T	Indian Traditional Knowledge	1	0	0	0		
18LEM110L	Indian Art Form	0	0	2	0		
18CYM101T	Environmental Science	1	0	0	0		
18CEM401J	Professional Enhancement Course 1	1	0	2	0		
18CEM402T	Professional Enhancement Course 2	1	0	0	0		

Basic Science Courses (B)							
Course Code	Course Title	Hours/ Week					
		L	T	P			
18PYB102J	Physics: Mechanics and Mechanics of Solids	3	1	2	5		
18CYB101J	Chemistry	3	1	2	5		
18MAB101T	Calculus and Linear Algebra	3	1	0	4		
18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4		
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4		
18MAB202T	Numerical Methods for Engineers	3	1	0	4		
18MAB301T	Probability and Statistics	3	1	0	4		
18BTB101T	Biology	2	0	0	2		
Total Learning Credits							32

Professional Core Courses (C)							
Course Code	Course Title	Hours/ Week					
		L	T	P			
18CEC201T	Engineering Geology	3	1	0	4		
18CEC202T	Fluid Mechanics	2	1	0	3		
18CEC202L	Fluid Mechanics Laboratory	0	0	2	1		
18CEC203T	Mechanics of Structures	2	1	0	3		
18CEC203L	Strength of Materials Laboratory	0	0	2	1		
18CEC204T	Engineering Surveying	2	1	0	3		
18CEC204L	Engineering Surveying Laboratory	0	0	2	1		
18CEC205T	Structural Analysis	2	1	0	3		
18CEC205L	Computer Aided Structural Analysis Laboratory	0	0	2	1		
18CEC206T	Hydraulic Engineering and Design	2	1	0	3		
18CEC206L	Hydraulic Engineering Laboratory	0	0	2	1		
18CEC207T	Design of RC and Steel Structures	4	0	0	4		
18CEC208T	Environmental Engineering and Design	2	1	0	3		
18CEC208L	Environmental Engineering Laboratory	0	0	2	1		
18CEC301T	Hydrology and Water Resources Engineering	3	1	0	4		
18CEC302T	Geotechnical Engineering	2	1	0	3		
18CEC302L	Geotechnical Engineering Laboratory	0	0	2	1		
18CEC303T	Highway Engineering and Design	2	1	0	3		
18CEC303L	Highway Engineering Laboratory	0	0	2	1		
18CEC304T	Construction Engineering and Management	2	1	0	3		
18CEC304L	Construction Engineering and Management Laboratory	0	0	2	1		
18CEC350T	Comprehension	0	1	0	1		
Total Learning Credits							49

Project Work, Seminar, Internship In Industry / Higher Technical Institutions (P)							
Course Code	Course Title	Hours/ Week					
		L	T	P	C		
18CEP101L	Massive Open Online Course – I						
18CEP102L	Industrial Training-I	0	0	2	1		
18CEP103L	Seminar – I						
18CEP104L	Massive Open Online Course - II						
18CEP105L	Industrial Training-II	0	0	2	1		
18CEP106L	Seminar – II						
18CEP107L	Minor Project	0	0	6	3		
18CEP108L	Internship (4-6 weeks)						
18CEP109L	Project	0	0	20	10		
18CEP110L	Semester Internship						
Total Learning Credits							15

Open Elective Courses (O) Any 6 Courses							
Course Code	Course Title	Hours/ Week					
		L	T	P			
Courses offered to Civil Engineering							
18CEO301T	Advanced Design of RCC	2	1	0	3		
18CEO302J	Modern Civil Engineering Economics	2	0	2	3		
18CEO303J	Modern Tools in Engineering Surveying	2	0	2	3		
18CEO304T	Emerging Trends in Steel Design	2	1	0	3		
18CEO401T	Advanced Prestressed Concrete Structures	3	0	0	3		
18CEO402T	Bridge Engineering	3	0	0	3		
18CEO404J	Fundamentals of Computing	2	0	2	3		
Total Learning Credits							18
Courses offered to other Engineering branches							
18CEO305T	Environmental Impact Assessment	3	0	0	3		
18CEO306T	Municipal Solid Waste Management	3	0	0	3		
18CEO307T	Disaster Mitigation and Management	3	0	0	3		
18CEO405T	Water Pollution and its Management	3	0	0	3		
18CEO406T	Global Warming and Climate Change	3	0	0	3		
18CEO407T	Applications of Remote Sensing and GIS	3	0	0	3		
Total Learning Credits							18

Professional Elective Courses (E)						
Any 6 Courses						
Course Code	Course Title	Hours/ Week			C	
		L	T	P		
	<b>Geotechnical Engineering</b>					
18CEE301T	Foundation Engineering and Design	3	0	0	3	
18CEE302T	Geotechnical Design	3	0	0	3	
18CEE303T	Ground Improvement Techniques	3	0	0	3	
18CEE304T	Foundation on Expansive Soil	3	0	0	3	
	<b>Structural Engineering</b>					
18CEE305J	Concrete Technology	2	0	2	3	
18CEE306T	Prestressed Concrete Structures	3	0	0	3	
18CEE307T	Design of Earthquake Resistant Structures	3	0	0	3	
18CEE308T	Design of Steel-Concrete Composite Structures	3	0	0	3	
18CEE309T	Geographic Information System	3	0	0	3	
	<b>Environmental Engineering</b>					
18CEE310T	Solid and Hazardous Waste Management	3	0	0	3	
18CEE311T	Air and Noise Pollution and Control	3	0	0	3	
18CEE312T	Environmental Impact Assessment and Life Cycle Analysis	3	0	0	3	

Professional Elective Courses (E)						
Any 6 Courses						
Course Code	Course Title	Hours/ Week			C	
		L	T	P		
	<b>Water Resources Engineering</b>					
18CEE313T	Design of hydraulic structures and Irrigation Engineering	3	0	0	3	
18CEE314T	Ground Water Engineering	3	0	0	3	
18CEE315T	Surface Hydrology	3	0	0	3	
	<b>Transportation Engineering</b>					
18CEE401T	Pavement Analysis and Design	3	0	0	3	
18CEE402T	Railways, Airport and Harbour Engineering	3	0	0	3	
18CEE403T	Traffic Engineering and Management	3	0	0	3	
	<b>Construction Engineering and Management</b>					
18CEE404T	Construction Equipment and Automation	3	0	0	3	
18CEE405T	Contracts Management	3	0	0	3	
18CEE406T	Repairs and Rehabilitation of Structures	3	0	0	3	
18CEE407T	Sustainable Construction Methods	3	0	0	3	
Total Learning Credits					18	

### 9. (f) Program Articulation: B.Tech. in Civil Engineering

Course Code	Course Name	Program Learning Outcomes (PLO)												
		Graduate Attributes											PSO	
		Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	
18CEC201T	Engineering Geology	H	H	M	M	L	L	L	L	L	L	L	H	M
18CEC202T	Fluid Mechanics	H	H	M	M	M	L	L	L	L	L	L	H	M
18CEC202L	Fluid Mechanics Laboratory	H	H	M	M	M	L	M	M	L	M	L	H	M
18CEC203T	Mechanics of Structures	H	M	M	M	M	L	M	L	M	M	L	H	H
18CEC203L	Strength of Materials Laboratory	H	M	M	M	M	L	M	L	M	M	M	H	H
18CEC204T	Engineering Surveying	H	H	M	M	M	L	L	L	M	M	M	M	M
18CEC204L	Engineering Surveying Laboratory	H	H	H	H	M	L	L	L	M	L	M	H	L
18CEC205T	Structural Analysis	H	H	M	H	M	L	M	M	L	L	M	H	M
18CEC205L	Computer Aided Structural Analysis Laboratory	H	H	H	H	M	L	L	L	M	M	M	M	L
18CEC206T	Hydraulic Engineering and Design	H	H	H	H	M	L	L	L	H	L	M	H	H
18CEC206L	Hydraulic Engineering Laboratory	H	H	M	H	M	L	M	M	L	L	M	H	M
18CEC207T	Design of RC and Steel Structures	H	H	M	M	M	L	L	L	M	M	M	M	M
18CEC208T	Environmental Engineering and Design	H	H	H	H	M	M	M	L	L	L	M	L	L
18CEC208L	Environmental Engineering Laboratory	H	H	H	H	M	L	M	L	H	L	M	H	M
18CEC301T	Hydrology and Water Resources Engineering	H	H	M	H	M	L	L	L	M	M	M	H	M
18CEC302T	Geotechnical Engineering	H	H	M	M	H	H	H	L	M	L	L	H	M
18CEC302L	Geotechnical Engineering Laboratory	H	H	M	M	M	L	L	L	M	M	M	M	M
18CEC303T	Highway Engineering and Design	H	H	M	M	M	L	L	L	M	M	H	M	M
18CEC303L	Highway Engineering Laboratory	H	H	M	H	M	L	L	L	M	M	M	H	M
18CEC304T	Construction Engineering and Management	H	H	M	H	M	L	L	L	M	M	M	H	M
18CEC304L	Construction Engineering & Management Lab	H	H	M	H	M	L	L	L	M	M	M	H	M
18CEC350T	Comprehension	H	H	H	H	M	M	H	M	M	M	H	H	M
18CEP101L	Massive Open Online Course - I	H	M	M	M	M	M	M	M	H	H	H	M	H
18CEP102L	Industrial Training-I	H	M	M	M	M	M	M	M	H	H	H	M	H
18CEP103L	Seminar - I	H	M	M	M	M	M	M	M	H	H	H	M	H
18CEP104L	Massive Open Online Course - II	H	M	M	M	M	M	M	M	H	H	H	M	H
18CEP105L	Industrial Training-II	H	M	M	M	M	M	M	M	H	H	H	M	H
18CEP106L	Seminar - II	H	M	M	M	M	M	M	M	H	H	H	M	H
18CEP107L	Minor Project	H	H	H	H	H	M	M	H	H	H	H	H	M
18CEP108L	Internship (4-6 weeks)	H	H	H	H	H	M	M	H	H	H	H	H	M
18CEP109L	Project	H	H	H	H	H	M	M	H	H	H	H	H	M
18CEP110L	Semester Internship	H	H	H	H	H	M	M	H	H	H	H	H	M
	Program Average	H	H	M	H	M	L	M	L	M	M	M	H	M

### 9. (g) Implementation Plan: B.Tech. in Civil Engineering

Semester - I					Semester - II						
Code	Course Title	Hours/ Week			C	Code	Course Title	Hours/ Week			C
		L	T	P				L	T	P	
18LEH101J	English	2	0	2	3	18LEH10XJ	Chinese / French / German / Japanese/ Korean	2	0	2	3
18MAB101T	Calculus and Linear Algebra	3	1	0	4	18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
18PYB102J	Physics: Mechanics and Mechanics of Solids	3	1	2	5	18CYB101J	Chemistry	3	1	2	5
18MES101L	Engineering Graphics and Design	1	0	4	3	18EES102L	Electrical and Electronics Eng. Workshop	1	0	4	3
18MES102J	Basic Civil and Mechanical Engineering	3	1	2	5	18CSS101J	Programming for Problem Solving	3	0	4	5
18PDM101L	Professional Skills and Practices	0	0	2	0	18PDH101T	General Aptitude	0	0	2	1
18LEM101T	Constitution of India	1	0	0	0	18LEM102J	Value Education	1	0	1	0
18GNM101L	Physical and Mental Health using Yoga	0	0	2	0	18GNM102L	NSS	0	0	2	0
Total Learning Credits					20	18GNM103L	NCC				
						18GNM104L	NSO				
						Total Learning Credits					21
Semester - III					Semester - IV						
Code	Course Title	Hours/ Week			C	Code	Course Title	Hours/ Week			C
		L	T	P				L	T	P	
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4	18MAB202T	Numerical Methods for Engineers	3	1	0	4
18BTB101T	Biology	2	0	0	2	18CEC205T	Structural Analysis	2	1	0	3
18CEC201T	Engineering Geology	3	1	0	4	18CEC205L	Computer Aided Structural Analysis Laboratory	0	0	2	1
18CEC202T	Fluid Mechanics	2	1	0	3	18CEC206T	Hydraulic Engineering and Design	2	1	0	3
18CEC202L	Fluid Mechanics Laboratory	0	0	2	1	18CEC206L	Hydraulic Engineering Laboratory	0	0	2	1
18CEC203T	Mechanics of Structures	2	1	0	3	18CEC207T	Design of RC and Steel Structures	4	0	0	4
18CEC203L	Strength of Materials Laboratory	0	0	2	1	18CEC208T	Environmental Engineering and Design	2	1	0	3
18CEC204T	Engineering Surveying	2	1	0	3	18CEC208L	Environmental Engineering Laboratory	0	0	2	1
18CEC204L	Engineering Surveying Laboratory	0	0	2	1	18PDH103T	Social Engineering	2	0	0	2
18PDH102T	Management Principles for Engineers	2	0	0	2	18PDM202L	Critical and Creative Thinking Skills	0	0	2	0
18PDM201L	Competencies in Social Skills	0	0	2	0	18PDM204L	Business Basics for Entrepreneurs				
18PDM203L	Entrepreneurial Skill Development					18CYM101T	Environmental Science	1	0	0	0
Total Learning Credits					24	Total Learning Credits					22
Semester - V					Semester - VI						
Code	Course Title	Hours/ Week			C	Code	Course Title	Hours/ Week			C
		L	T	P				L	T	P	
18MAB301T	Probability and Statistics	3	1	0	4	18CEC303T	Highway Engineering and Design	2	1	0	3
18CEC301T	Hydrology and Water Resources Engineering	3	1	0	4	18CEC303L	Highway Engineering Laboratory	0	0	2	1
18CEC302T	Geotechnical Engineering	2	1	0	3	18CEC304T	Construction Engineering and Management	2	1	0	3
18CEC302L	Geotechnical Engineering Laboratory	0	0	2	1	18CEC304L	Construction Engineering and Management Laboratory	0	0	2	1
	Professional Elective – 1	3	0	0	3	18CEC350T	Comprehension	0	1	0	1
	Open Elective – 1	3	0	0	3		Professional Elective – 2	3	0	0	3
	Open Elective – 2	3	0	0	3		Professional Elective – 3	3	0	0	3
18CEP101L	Massive Open Online Course - I	0	0	2	1		Open Elective – 3	3	0	0	3
18CEP102L	Industrial Training-I						Open Elective – 4	3	0	0	3
18CEP103L	Seminar - I					18CEP104L	Massive Open Online Course - II	0	0	2	1
18PDM301L	Analytical and Logical Thinking Skills	0	0	2	0	18CEP105L	Industrial Training-II				
18PDM302L	Entrepreneurship Management					18CEP106L	Seminar - II				
18LEM109T	Indian Traditional Knowledge	1	0	0	0	18PDH201T	Employability Skills and Practices	0	0	2	1
Total Learning Credits					22	18LEM110L	Indian Art Form	0	0	2	0
						Total Learning Credits					23
Semester - VII					Semester - VIII						
Code	Course Title	Hours/ Week			C	Code	Course Title	Hours/ Week			C
		L	T	P				L	T	P	
	Professional Elective – 4	3	0	0	3	18CEP109L	Project	0	0	20	10
	Professional Elective – 5	3	0	0	3	18CEP110L	Semester Internship				
	Professional Elective – 6	3	0	0	3	18CEM402T	Professional Enhancement Course 2	1	0	0	0
	Open Elective – 5	3	0	0	3						
	Open Elective – 6	3	0	0	3						
18CEP107L	Minor Project	0	0	6	3	Total Learning Credits					10
18CEP108L	Internship (4-6 weeks)										
18CEM401J	Professional Enhancement Course 1	1	0	2	0						
Total Learning Credits					18						