

13. B.Tech.in Civil Engineering

13. (a) Mission of the Department

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

13. (b) Program Educational Objectives (PEO)

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

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

	Mission Stmt. – 1	Mission Stmt. – 2	Mission Stmt. – 3
PEO – 1	3	3	2
PEO – 2	3	2	3
PEO – 3	3	2	3
PEO – 4	3	2	3

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

13. (d) Mapping Program Educational Objectives (PEO) to Program Outcomes (PO)

	Program Outcomes (PO)											
	Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning
PEO – 1	3	3	3	3	3	1	1	1	1	1	1	1
PEO – 2	3	3	3	3	3	1	1	1	1	1	1	1
PEO – 3	1	1	1	1	2	2	1	3	3	3	3	3
PEO – 4	1	1	1	1	1	3	3	3	2	2	2	3

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

13. (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	
21LEH101T	Communicative English	2	1	0	3	
21LEH102T	Chinese					
21LEH103T	French					
21LEH104T	German	2	1	0	3	
21LEH105T	Japanese					
21LEH106T	Korean					
21LEH107T	Spanish					
21GNH101J	Philosophy of Engineering	1	0	2	2	
21PDH201T	Social Engineering	2	0	0	2	
21GNH401T	Behavioural Psychology	2	1	0	3	
Total Credits						13

Engineering Science Courses (S)						
Course Code	Course Title	Hours/ Week				
		L	T	P	C	
21MES102L	Engineering Graphics and Design	0	0	4	2	
21MES101L	Basic Civil and Mechanical Workshop	0	0	4	2	
21EES101T	Electrical and Electronics Engineering	3	1	0	4	
21CSS101J	Programming for Problem Solving	3	0	2	4	
21DCS201P	Design Thinking and Methodology	1	0	4	3	
21CES201T	Mechanics of Structures	3	0	0	3	
21CSS303T	Data Science	2	0	0	2	
Total Credits						20

Mandatory Courses (M)						
Code	Course Title	L	T	P	C	
21PDM101L	Professional Skills and Practices	0	0	2	0	
21PDM102L	General Aptitude	0	0	2	0	
21PDM201L	Verbal Reasoning	0	0	2	0	
21PDM202L	Critical and Creative Thinking Skills	0	0	2	0	
21PDM301L	Analytical and Logical Thinking Skills	0	0	2	0	
21PDM302L	Employability Skills and Practices	0	0	2	0	
21CYM101T	Environmental Science	1	0	0	0	
21LEM101T	Constitution of India	1	0	0	0	
21LEM201T	Professional Ethics	1	0	0	0	
21LEM202T	Universal Human Values	1	0	0	0	
21LEM301T	Indian Art Form	1	0	0	0	
21LEM302T	Indian Traditional Knowledge	1	0	0	0	
21GNM101L	Physical and Mental Health using Yoga					
21GNM102L	NSS	0	0	2	0	
21GNM103L	NCC					
21GNM104L	NSO					
Total Credits						0

Open Elective Courses (O) Any 3 Courses						
Course Code	Course Title	Hours/ Week				
		L	T	P	C	
21CEO301T	Maintenance and Rehabilitation of Structures	3	0	0	3	
21CEO302T	Disaster Resistant Structures	3	0	0	3	
21CEO303T	Smart City and Infrastructure	3	0	0	3	
21CEO304T	Real Estate Management	3	0	0	3	
21CEO305T	Project Management	3	0	0	3	
21CEO306T	Environmental Impact Assessment	3	0	0	3	
21CEO307T	Municipal Solid Waste Management	3	0	0	3	
21CEO308T	Disaster Mitigation and Management	3	0	0	3	
21CEO309T	Water Pollution and its Management	3	0	0	3	
21CEO310T	Global Warming and Climate Change	3	0	0	3	
21CEO311T	Indoor and Ambient Air Quality Management	3	0	0	3	
21CEO312T	Intelligent Transportation Systems	3	0	0	3	
21CEO313T	Traffic Management Systems	3	0	0	3	
21CEO314T	Traffic flow Modeling and Simulation Techniques	3	0	0	3	
21CEO315T	Viscoelasticity	3	0	0	3	
21CEO316T	Soil Sciences	3	0	0	3	

Basic Science Courses (B)						
Course Code	Course Title	Hours/ Week				
		L	T	P	C	
21MAB101T	Calculus and Linear Algebra	3	1	0	4	
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4	
21CYB101J	Chemistry	3	1	2	5	
21BTB103T	Biology	2	0	0	2	
21PYB104J	Physics : Mechanics	3	1	2	5	
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4	
21CEB201J	Applied Geology	3	0	2	4	
21MAB301T	Probability and Statistics	3	1	0	4	
Total Credits						32

Professional Core Courses I						
Course Code	Course Title	Hours/ Week				
		L	T	P	C	
21CEC101T	Building Materials in the Built Environment	3	0	0	3	
21CEC201T	Hydro Mechanics and Hydraulic Engineering	3	0	0	3	
21CEC201L	Fluid Mechanics and Machinery Lab	0	0	2	1	
21CEC202T	Engineering Surveying	3	0	0	3	
21CEC202L	Surveying Lab	0	0	2	1	
21CEC203T	Environmental Engineering and Design	3	0	0	3	
21CEC203L	Environmental Engineering Laboratory	0	0	2	1	
21CSC206T	Artificial Intelligence	2	1	0	3	
21CEC204T	Structural Engineering Design-I	3	0	0	3	
21CEC204L	Concrete Technology and Strength of Materials Laboratory	0	0	2	1	
21CEC205T	Geomechanics	3	0	0	3	
21CEC205L	Geomechanics Laboratory	0	0	2	1	
21CEC206T	Irrigation and Water Resources Engineering	3	0	0	3	
21CEC207T	Concrete Technology and Special Concrete	3	0	0	3	
21CEC301T	Structural Analysis	3	0	0	3	
21CEC301L	Computer-Aided Civil Engineering Laboratory	0	0	2	1	
21CEC302T	Structural Engineering Design-II	2	1	0	3	
21CEC303T	Transportation Engineering	3	0	0	3	
21CEC303L	Transportation Engineering Laboratory	0	0	2	1	
21CEC304T	Construction Engineering and Management	3	0	0	3	
Total Credits						46

Project Work, Seminar, Internship In Industry / Higher Technical Institutions (P)						
Course Code	Course Title	Hours/ Week				
		L	T	P	C	
21GNP301L	Community Connect	0	0	2	1	
21CEP302L	Project	0	0	6	3	
21CEP303T	MOOC	3	0	0		
21CEP401L	Major Project	0	0	30	15	
21CEP402L	Internship					
Total Credits						19

Open Elective Courses (O) Any 3 Courses						
Course Code	Course Title	Hours/ Week				
		L	T	P	C	
21CEO317J	Rural Development and Technology	2	0	2	3	
21CEO318T	Floods and Flood Management	3	0	0	3	
21CEO319T	Climate Change and Water Resources Management	3	0	0	3	
21CEO320T	Principles of Satellite Remote Sensing	3	0	0	3	
21CEO321T	Spatial Information System	3	0	0	3	
21CEO322T	Remote sensing and GIS applications in Engineering	3	0	0	3	
21CEO323T	Spatial technology in Engineering	3	0	0	3	
21CEO324T	GIS and Spatial Analysis	3	0	0	3	
21CEO325T	Web GIS	3	0	0	3	
21CEO401T	Building Materials	3	0	0	3	
21CEO402T	Introduction to Environmental Studies	3	0	0	3	
21CEO403T	Integrated Waste Management	3	0	0	3	
21CEO404T	Principles of Sustainable Development	3	0	0	3	
21CEO405T	Road Safety and Audit	3	0	0	3	
21CEO406T	Traffic Management System	3	0	0	3	
21CEO407T	Rheology of Complex materials	3	0	0	3	
21CEO408T	Water Conservation and Management	3	0	0	3	

								Open Elective Courses (O) Any 3 Course						
Course Code		Course Title				Hours/ Week								
						L	T	P	C					
21CEO409T		Water Quantity and Quality				3	0	0	3					
21CEO410T		Remote Sensing Surveying				3	0	0	3					
21CEO411T		Introduction to GIS and data				3	0	0	3					
21CEO412T		Web and Mobile GIS				3	0	0	3					
21CEO413T		Digital Mapping				3	0	0	3					
								Total Credits			09			

Professional Elective Courses (E) Any 7 Courses								Professional Elective Courses (E) Any 7 Courses													
Course Code		Course Title				Hours/ Week					Course Code		Course Title				Hours/ Week				
						L	T	P	C								L	T	P	C	
		Professional Elective – 1											Professional Elective – 5								
21CEE301T	Foundation Engineering and Design				3	0	0	3		21CEE404T	Surface Hydrology				3	0	0	3			
21CEE302T	Geotechnical Design				3	0	0	3		21CEE405T	Groundwater Engineering				3	0	0	3			
21CEE303T	Ground Improvement Techniques				3	0	0	3		21CEE406T	Design of Hydraulic Structures and Irrigation Engineering				3	0	0	3			
21CEE304T	Foundation on Expansive Soil				3	0	0	3		21CEE407T	Advance Hydraulic Engineering and Design				3	0	0	3			
		Professional Elective – 2										Professional Elective – 6									
21CEE305T	Solid and Hazardous Waste Management				3	0	0	3		21CEE408T	Fundamentals of Remote Sensing and GIS				3	0	0	3			
21CEE306T	Air and Noise Pollution Control				3	0	0	3		21CEE409T	GIS and its Techniques				3	0	0	3			
21CEE307T	Environmental Impact Assessment and Life Cycle Analysis				3	0	0	3				Professional Elective – 7									
		Professional Elective – 3								21CEE410T	Construction Equipment and Automation				3	0	0	3			
21CEE308T	Pavement analysis and design				3	0	0	3		21CEE411T	Contracts Management				3	0	0	3			
21CEE309T	Railway, Airport and Harbour Engineering				3	0	0	3		21CEE412T	Repairs and Rehabilitation techniques				3	0	0	3			
21CEE310T	Traffic Engineering				3	0	0	3		21CEE413T	Sustainable Construction Methods				3	0	0	3			
21CEE311T	Pavement Construction Technology				3	0	0	3		21CEE414T	BIM in Construction Management				3	0	0	3			
21CEE312T	Computer application in Transportation Engineering				3	0	0	3		21CEE415T	Modern Civil Engineering Economics				3	0	0	3			
		Professional Elective – 4								Total Credits								21			
21CEE401T	Advanced Pre-stressed Concrete				3	0	0	3													
21CEE402T	Earthquake Resistant Design of Structures				3	0	0	3													
21CEE403T	Design of Steel Concrete Composite Structures				3	0	0	3													

13. (f) Implementation Plan: B.Tech. in Civil Engineering

Semester – I					
Code	Course Title	Hours/ Week			C
		L	T	P	
21LEH101T	Communicative English	2	1	0	3
21MAB101T	Calculus and Linear Algebra	3	1	0	4
21PYB104J	Physics : Mechanics	3	1	2	5
21MES102L	Engineering Graphics and Design	0	0	4	2
21EES101T	Electrical and Electronics Engineering	3	1	0	4
21CYM101T	Environmental Science*	1	0	0	0
21PDM101L	Professional Skills and Practices	0	0	2	0
21LEM101T	Constitution of India	1	0	0	0
Total Credits					18

Semester – II					
Code	Course Title	Hours/ Week			C
		L	T	P	
21LEH102T	Chinese	2	1	0	3
21LEH103T	French				
21LEH104T	German				
21LEH105T	Japanese				
21LEH106T	Korean				
21LEH107T	Spanish				
21GNH101J	Philosophy of Engineering	1	0	2	2
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
21CYB101J	Chemistry	3	1	2	5
21CEC101T	Building Materials in the Built Environment	3	0	0	3
21CSS101J	Programming for Problem Solving	3	0	2	4
21BTB103T	Biology	2	0	0	2
21MES101L	Basic Civil and Mechanical Workshop	0	0	4	2
21PDM102L	General Aptitude*	0	0	2	0
21GNM101L	Physical and Mental Health using Yoga	0	0	2	0
21GNM102L	NSS				
21GNM103L	NCC				
21GNM104L	NSO				
Total Credits					25

Semester – III					
Code	Course Title	Hours/ Week			C
		L	T	P	
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4
21CEC201T	Hydro Mechanics and Hydraulic Engineering	3	0	0	3
21CEC201L	Fluid Mechanics and Machinery Lab	0	0	2	1
21CEC202T	Engineering Surveying	3	0	0	3
21CEC202L	Surveying Lab	0	0	2	1
21CEC203T	Environmental Engineering and Design	3	0	0	3
21CEC203L	Environmental Engineering Laboratory	0	0	2	1
21DCS201P	Design Thinking and Methodology	1	0	4	3
21CES201T	Mechanics of Structures	3	0	0	3
21LEM201T	Professional Ethics	1	0	0	0
21PDM201L	Verbal Reasoning	0	0	2	0
Total Credits					22

Semester – IV					
Code	Course Title	Hours/ Week			C
		L	T	P	
21CEB201J	Applied Geology	3	0	2	4
21CSC206T	Artificial Intelligence	2	1	0	3
21CEC204T	Structural Engineering Design-I	3	0	0	3
21CEC204L	Concrete Technology and Strength of Materials Laboratory	0	0	2	1
21CEC205T	Geomechanics	3	0	0	3
21CEC205L	Geomechanics Laboratory	0	0	2	1
21CEC206T	Irrigation and Water Resources Engineering	3	0	0	3
21CEC207T	Concrete Technology and Special Concrete	3	0	0	3
21PDH201T	Social Engineering	2	0	0	2
21PDM202L	Critical and Creative Thinking Skills	0	0	2	0
21LEM202T	Universal Human Values	1	0	0	0
Total Credits					23

Semester – V					
Code	Course Title	Hours/ Week			C
		L	T	P	
21MAB301T	Probability and Statistics	3	1	0	4
21CEC301T	Structural Analysis	3	0	0	3
21CEC301L	Computer-Aided Civil Engineering Laboratory	0	0	2	1
21CEC302T	Structural Engineering Design-II	2	1	0	3
21CEC303T	Transportation Engineering	3	0	0	3
21CEC303L	Transportation Engineering Laboratory	0	0	2	1
E-1	Professional Elective – I	3	0	0	3
O	Open Elective – I	3	0	0	3
21PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
21LEM301T	Indian Art Form	1	0	0	0
21GNP301L	Community Connect	0	0	2	1
Total Credits					22

Semester – VI					
Code	Course Title	Hours/ Week			C
		L	T	P	
21CSS303T	Data Science	2	0	0	2
21CEC304T	Construction Engineering and Management	3	0	0	3
E-2	Professional Elective – II	3	0	0	3
E-3	Professional Elective – III	3	0	0	3
21CEP302L	Project	0	0	6	3
21CEP303T	MOOC	3	0	0	
O	Open Elective – II	3	0	0	3
21PDM302L	Employability Skills and Practices	0	0	2	0
21LEM302T	Indian Traditional Knowledge	1	0	0	0
Total Credits					17

Semester – VII					
Code	Course Title	Hours/ Week			C
		L	T	P	
21GNH401T	Behavioral Psychology	2	1	0	3
E-4	Professional Elective – IV	3	0	0	3
E-5	Professional Elective – V	3	0	0	3
E-6	Professional Elective – VI	3	0	0	3
E-7	Professional Elective – VII	3	0	0	3
O	Open Elective – III	3	0	0	3
Total Credits					18

Semester – VIII					
Code	Course Title	Hours/ Week			C
		L	T	P	
21CEP401L	Major Project	0	0	30	15
21CEP402L	Internship				
Total Credits					15