SCHOOL OF ENGINEERING AND SCIENCES

B. Tech Civil Engineering

2023-27 Batch

Category Wise Credit Distribution

Course Sub-category	Subcategory Credits	Category Credits	Learning hours
Ability Enhancement Courses (AEC)		8	
University AEC	4		**240**
School AEC	4		
Value Added Courses (VAC)		8	
University VAC	4		**240**
School VAC	4		
Skill Enhancement Courses (SEC)		16	
School SEC	5		**420**
Department SEC	6		
SEC Elective	5		
Foundation/ Interdisciplinary courses (FIC)		18	
School FIC	18		**540**
Department FIC	0		
Core + Core Elective including Specialization (CC)		81	
Core	66		**2430**
Core Elective (Inc Specialization)	15		
Minor (MC) + Open Elective (OE)		15	450
Research / Design / Internship/ Project (RDIP)		16	
Internship / Design Project / Startup / NGO	4		**480**
Internship / Research / Thesis	12		
Total		162	4860

Semester Wise Course Credit Distribution Under Various Categories

	Semester									
Category	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**Total**	**%age**
Ability Enhancement Courses (AEC)	2	2	2	2	0	0	0	0	8	4.9
Value Added Courses (UG Common) (VAC)	2	2	0	0	0	4	0	0	8	4.9
Skill Enhancement Courses (SEC)	3	2	3	3	3	2	0	0	16	9.8
Foundation/ Interdisciplinary courses (FIC)	12	6	0	0	0	0	0	0	18	11.1
Major Core + Specialization (CC)	0	8	14	15	18	17	9	0	81	50
Minor (MC) + Open Elective (OE)	0	0	3	3	3	3	3	0	15	9.3
Research / Design / Industrial Practice / Project (RDIP)	0	0	0	0	0	0	4	12	16	9.9
Grand Total	19	20	22	23	24	26	16	12	**162**	**100**

B. Tech - Civil Engineering

Semester-1							
Category	**Sub-Category**	**Course Title**	**L**	**T/D**	**P/Pr**	**Credits**	**Learning Hours**
AEC	University AEC	Art of Listening, Speaking and Reading Skills	1	0	1	2	60
VAC	University VAC	Environmental Science	2	0	0	2	60
SEC	School SEC	Analytical Reasoning and Aptitude Skills	1	1	1	3	90
FIC	School FIC	Fundamentals of Chemistry for Engineers	2	0	1	3	90
FIC	School FIC	Calculus for Engineers	3	0	0	3	90
FIC	School FIC	Fundamentals of Computing and Programming in C	2	1	1	4	120
FIC	School FIC	Emerging Technologies	2	0	0	2	60
					Semester Total	**19**	**570**
Semester-2							
Category	**Sub-Category**	**Course Title**	**L**	**T/D**	**P/Pr**	**Credits**	**Learning Hours**
AEC	University AEC	Effective Writing and Presentation Skills	1	0	1	2	60
VAC	University VAC	Universal Human Values and Ethics	2	0	0	2	60
SEC	School SEC	Entrepreneurial Mindset	0	0	2	2	60
FIC	School FIC	Principles of Economics and Management	3	0	0	3	90
FIC	School FIC	Linear Algebra and Differential Equations	3	0	0	3	90
CC	Core	Structural Mechanics	2	1	1	4	120
CC	Core	Fluid Mechanics	2	1	1	4	120

						Semester Total	20	600

Category	Sub-Category	Course Title	L	T/D	P/Pr	Credits	Learning Hours
AEC	School AEC	Problem-Solving Skills	1	0	1	2	60
VAC	School VAC	Co-Curricular Activities	0	0	2	2*	60*
VAC	School VAC	Community Service and Social Responsibility	2	0	0	2*	60*
SEC	Department/School SEC	Data Structures	2	0	1	3	90
CC	Core	Spatial Data Acquisition	2	1	1	4	120
CC	Core	Probability and Statistics	3	0	0	3	90
CC	Core	Civil Engineering Materials	2	0	1	3	90
CC	Core	Analysis of Determinate and Indeterminate Structures	2	1	1	4	120
OE/Minor	OE/Minor					3	90
					Semester Total	22	660

Semester-4

Category	Sub-Category	Course Title	L	T/D	P/Pr	Credits	Learning Hours
AEC	School AEC	Creativity and Critical thinking Skills	1	0	1	2	60
VAC	School VAC	Co-Curricular Activities	0	0	2	2*	60*
VAC	School VAC	Community Service and Social Responsibility	2	0	0	2*	60*

Category	Sub-Category	Course Title	L	T/D	P/Pr	Credits	Learning Hours
SEC	Department/ School SEC	Numerical Methods and its Application in Civil Engineering	1	1	1	3	90
CC	Core	Reinforced Concrete Design	3	0	1	4	120
CC	Core	Soil Behaviour and Engineering	2	1	1	4	120
CC	Core	Modern Highway Engineering	2	1	1	4	120
CC	Core	Engineering Hydrology	1	1	1	3	90
OE/Minor	OE/Minor					3	90
					Semester Total	**23**	**690**

Semester-5

Category	Sub-Category	Course Title	L	T/D	P/Pr	Credits	Learning Hours
VAC	School VAC	Co-Curricular Activities	0	0	2	2*	60*
VAC	School VAC	Community Service and Social Responsibility	2	0	0	2*	60*
SEC	SEC Elective	Career Skills-1	1	0	2	3	90
CC	Core	Computer Aided Drawing and Estimation	0	1	2	3	90
CC	Core	Geotechnical Analysis and Design	2	1	1	4	120
CC	Core	Physico-chemical Water Treatment: Materials and Processes	2	1	1	4	120
CC	Core	Remote Sensing and GIS	1	1	1	3	90
CC	Core	High-Speed Railways, Airways, and Waterways Engineering	2	1	1	4	120
OE/Minor	OE/Minor		3	0	0	3	90

							Semester Total	24	720

Semester-6							
Category	**Sub-Category**	**Course Title**	**L**	**T/D**	**P/Pr**	**Credits**	**Learning Hours**
VAC	School VAC	Co-Curricular Activities	0	0	2	2	60
VAC	School VAC	Community Service and Social Responsibility	2	0	0	2	60
SEC	SEC Elective	Career Skills-2	0	0	2	2	60
CC	Core	Wastewater, Treatment: Disposal to Resource Recovery	2	0	1	3	90
CC	Core	Building Information Modelling and Management	2	0	2	4	90
CC	Core	Design of Steel Structures	3	0	1	4	90
CC	Core Elective	Core Elective-1	2	0	1	3	90
CC	Core Elective	Core Elective-2	2	0	1	3	90
OE/Minor	OE/Minor		3	0	0	3	90
					Semester Total	**26**	**780**

Semester-7							
Category	**Sub-Category**	**Course Title**	**L**	**T/D**	**P/Pr**	**Credits**	**Learning Hours**
CC	Core Elective	Core Elective-3	2	0	1	3	90
CC	Core Elective	Core Elective-4	2	0	1	3	90
CC	Core Elective	Core Elective-5	2	0	1	3	90
MC+OE	MC/OE		3	0	0	3	90
RDIP	Internship / Project	Summer internship/Project	0	0	4	4	60
					Semester Total	**16**	**480**

Semester-8							
Category	Sub-Category	Course Title	L	T/D	P/Pr	Credits	Learning Hours
RDIP	Internship / Research / Thesis	Major Project	0	0	12	12	360
Semester Total						12	360

Specialization Electives: Sustainable Highway and Airport Pavement Engineering	
1	Sustainable Paving Technologies and Materials
2	Advanced Design and Analysis for Durable Pavements
3	Emerging Pavement Management Systems
4	Paving Industry: Theory to Practice
5	Research in Highway and Airport Pavement Engineering

Specialization Electives: Water Resources and Geographic Information Systems	
1	Earth Observation of Water Resources
2	Water Resources Planning and Management
3	Watershed Management
4	Applications of Remote Sensing & GIS in Water Resources
5	Applications of Soft Computing Techniques
6	Open channel flow
7	Land and Watershed management
8	Watershed Hydrology and Conservation Planning

Specialization Electives: Environmental Engineering and Management	
1	Design of water distribution network systems
2	Advanced water and wastewater treatment systems
3	Sustainable waste management systems
4	Environmental systems modeling
5	Air Quality in Changing Environments

Specialization Electives: Computational Structural Engineering	
1	Introduction to Computational Solid Mechanics
2	Computational Structural Design and Optimization
3	Finite Element Method for Structural Engineers
4	Structural Dynamic and Earthquake Engineering
5	Sustainable and Resilient Design of Structures

Specialization Electives: Geotechnical and Geo-environmental Engineering	
1	Designing with Geosynthetics
2	Advanced Soil Mechanics
3	Ground Improvement Techniques
4	Geotechnical Hazards
5	Environmental Geotechnics

Core Electives:	
1	Digital Technologies for Construction
2	Advanced Reinforced concrete design
3	Introduction to Structural Dynamics
4	Earthquake Analysis and Design of Structures
5	Introduction to Finite Element Methods
6	Precast Structural Design and Construction
7	Reliability-Based Analysis and Design
8	Stability of Structures
9	Bridge Engineering
10	Introduction to Drone Technology
11	Design of Hydraulic Structure and Irrigation System
12	Design of Environmental engineering systems
13	Sustainable Waste Management Systems
14	Environmental Impact Assessment
15	Green Buildings

Minor Program: Infrastructure Planning and Management	
1	Building Information Modelling
2	Highway Engineering and Management
3	Principles and Practice in Infrastructure and Environment
4	Water Resources for Smart and Livable Cities
5	Construction Methods and Equipment
6	Socio-economic Sustainable Developments

Open Electives:	
1	Remote Sensing and GIS applications in Engineering
2	Drones for Asset Management
3	Civil Engineering Profession-Developing Nations