

**DEPARTMENT OF CIVIL ENGINEERING
COURSE STRUCTURE**

I Year (1st Semester)

S. No.	Category	Course Title	Hours per Week			Credits
			L	T	P	
1	CEF	Physics/Chemistry	2	1	2	4
2	CEF	Mathematics-I	3	1	0	4
3	HSS	Professional Communication	2	0	2	3
4	CEE/CES	Building Engineering-I	2	0	2	3
5	CEE	Plumbing & Sanitation Systems	2	0	2	3
6	PCE	Engineering Graphics and 3D Modelling	1	0	2	2
7	PCE	Environment and Climate Change	2	0	0	2
8	EAA	Professional Ethics & Social Values	-	-	4	2
Total			14	2	14	23

I Year (2nd Semester)

S. No.	Category	Course Title	Hours per Week			Credits
			L	T	P	
1	CEF	Chemistry/Physics	2	1	2	4
2	CEF	Mathematics-II	3	1	0	4
3	PCE	Introduction to AI and Machine Learning	2	0	2	3
4	CES	1. Sustainable Urban Habitat 2. Introduction to Transportation Systems 3. Infrastructure Engineering	2	1	0	3
5	CEE/CES	Building Engineering-II	2	1	0	3
6	PCE	Workshop & Manufacturing Processes	1	0	2	2
7	EAA	1. Yoga & Ayush 2. NCC/NSS 3. Foreign Lang/Ancient/Indian Lang. 4. Health & Nutrition 5. Nutrition & Balanced Diet 6. Self Defence	-	-	4	2
Total			12	4	10	21

II Year (3rd Semester)

S. No.	Category	Course Title	Hours per Week			Credits
			L	T	P	
1	HSS	Management Concepts and Applications	3	0	0	3
2	EAA	Extra Academic Activity-B	0	0	4	2
3	CEE	Solid Mechanics	3	1	2	5
4	CEE	Concrete Technology & Construction Management	3	0	2	4
5	CEE	Fluid Mechanics & Hydraulic Machines	3	1	2	5
6	CEE	Engineering Geology	2	0	2	3
7	CEE	Surveying	3	1	2	5
Total			17	3	14	27

II Year (4th Semester)*

S. No.	Category	Course Title	Hours per Week			Credits
			L	T	P	
1	HSS	Business Economics	3	0	0	3
2	CEE	Water Supply Engineering	3	1	0	4
3	CEE	Structural Analysis-I	3	1	0	4
4	CEE	Highway & Traffic Engineering	3	1	0	4
5	CEE	Geotechnical Engineering-I	3	0	2	4
6	CEE/CES	Geoinformatics	3	1	0	4
		Minors Course*				
Total			18	4	2	23

* Minor courses for students of other department students will be offered in 4th, 5th & 6th semester

III Year (5th Semester)*

S. No.	Category	Course Title	Hours per Week			Credits
			L	T	P	
1	CEE	Pavement Engineering & Management	3	0	2	4
2	CEE	Geotechnical Engineering-II	3	1	2	5
3	CEE	Waste Water Engineering	3	1	2	5
4	CEE	Concrete Structures-I	3	1	0	4
5	CEE	Irrigation Engineering	3	1	0	4
6	CEE	Structural Analysis-II	3	1	2	5
		Minors Course*				
Total			18	5	8	27

* Minor courses for students of other department students will be offered in 4th, 5th & 6th semester

III Year (6th Semester)*#

S. No.	Category	Course Title	Hours per Week			Credits
			L	T	P	
1	CEE	Steel Structures	3	1	2	5
2	CEE	Concrete Structures-II	3	0	2	4
3	CEE	Design of Hydraulic Structures	3	1	0	4
4	CEE	Software Applications in Civil Engineering	0	0	4	2
5	CEE	Engineering Hydrology	2	1	0	3
6	CEE/CES	Professional Elective-I	3	0	0	3
7	HSS	Soft Skills and Personality Development	2	0	1	3
		Minors Course*				
		Honours Course#				
		Research Course#				
Total			16	3	9	24

* Minor courses for students of other department students will be offered in 4th, 5th & 6th semester

Honours & Research Courses will be offered in 6th & 7th semester in addition to the courses listed in 6th & 7th sem

IV Year (7th Semester)#

S. No.	Category	Course Title	Hours per Week			Credits
			L	T	P	
1	CEE	Railway & Airport Engineering	3	1	0	4
2	CEE	Earthquake Resistant Design	2	1	0	3
3	CEE/CES	Professional Elective-II	3	0	0	3
		Honours Course#				
		Research Course#				
Total			8	2	0	10

Honours & Research Courses will be offered in 6th & 7th semester in addition to the regular courses.

IV Year (8th Semester) [Only B.Tech/Honours/Research/Minors]

S. No.	Course Type	Course Title	Credits
1	IG/GP	Job Orientation/GP/Research [@]	14
Total			14

[@] The students opting for Research in addition to the Regular B.Tech Programme will have to do a Research Project in the Institute in 8th semester.

Credits for Regular B.Tech Only

Name of Degree	Duration (years)	Semester	Credits Proposed			Credit Requirement
			Per Semester	Year	Degree	
Certificate	1	1	23	44	44	40-45
		2	21			
Diploma	2	3	27	50	94	80-90 (+6)
		4	23			
B.S.	3	5	27	51	145	120-135 (+9)
		6	24			
B.Tech	4	7	10	24	169	160-170
		8	14			

Credits for B.Tech with Honours/ Research

Name of Degree	Duration (years)	Semester	Credits Proposed		
			Per Semester	Year	Degree
Certificate	1	1	23	44	44
		2	21		
Diploma	2	3	27	50	94
		4	23		
B.S.	3	5	27	27	121
		6	24 (6 th sem B.Tech Only) + 10 (7 th sem B.Tech Only) + 20 (For Honours/ Research in 6 th & 7 th Sem)	54	175
B.Tech	4	7		14	
		8	14	14	189

POOLS OF COURSES FOR HONOURS (OFFERED IN 6TH & 7TH SEMESTER)

* Credit Requirement: 20 credits

* For completing the credit requirement, student can opt only for maximum two courses from any pool.

STRUCTURAL ENGINEERING						
S. No.	Course Code	Course Title	Hours per Week			Credits
			L	T	P	
1	HN****	Structural Dynamics	3	1	0	4
2	HN****	Advanced Concrete Design	3	1	0	4
3	HN****	Finite Element Method	3	1	0	4
4	HN****	Seismic Design of Structures	3	1	0	4
TRANSPORTATION ENGINEERING						
1	HN****	Traffic Flow Theory	3	1	0	4
2	HN****	Intelligent Transportation Systems	3	1	0	4
3	HN****	Software Applications in Transportation Engineering	3	0	2	4
ENVIRONMENTAL ENGINEERING						
1	HN****	Environmental Chemistry & Microbiology	3	1	0	4
2	HN****	Principles of Biological Wastewater Treatment	3	1	0	4
3	HN****	Physicochemical Processes for Water & Waste Water Treatment	3	1	0	4
GEOTECHNICAL ENGINEERING						
1	HN****	Geotechnical Earthquake Engineering	3	1	0	4
2	HN****	Rock Engineering	3	0	2	4
3	HN****	Ground Improvement	3	1	0	4
WATER RESOURCES & GEOINFORMATICS						
1	HN****	Artificial Intelligence for Remotely Sensed Image Processing and GIS	3	1	0	4
2	HN****	Advanced Geological and Geophysical Investigations	3	1	0	4
3	HN****	Water Resources and Climate Change	3	1	0	4
4	HN****	Hydropower Engineering	3	1	0	4
CONSTRUCTION ENGINEERING						
1	HN****	Advanced Construction Management	3	1	0	4
2	HN****	Energy Efficient Construction	3	1	0	4
3	HN****	3D Modelling and 3D Printing for Civil Engineering	3	1	0	4
ONLINE COURSES (MOOCS/ NPTEL)						
T-his pool will be created after receiving guidelines from Dean Acad. Office						

Note: The courses in pools will be offered based on the availability of the faculty

POOLS OF COURSES FOR RESEARCH (OFFERED IN 6TH & 7TH SEMESTER)

* Credit Requirement: 20 credits

* Student can opt all courses from one specialization only

POOL I-STRUCTURAL ENGINEERING						
S. No.	Course Code	Course Title	Hours per Week			Credits
			L	T	P	
1		Structural Dynamics	3	1	0	4
2		Advanced Concrete Design	3	1	0	4
3		Elective-I	3	1	0	4
4		Elective-II	3	1	0	4
5		Elective-III	3	1	0	4

S. No.	Course Code	Elective-I	S. No.	Course Code	Elective-II	S. No.	Course Code	Elective-III
1		Advanced Concrete Technology	1		Durability Assessment and Structural Strengthening of Reinforced Concrete	1		Structural Health Monitoring
2		Theory of Elasticity and Plasticity	2		Finite Element Method	2		Soft Computing Methods in Engineering Problem Solving
3		Seismic Design of Structures	3		High Rise Structures	3		Optimization Methods in Civil Engineering

POOL II-TRANSPORTATION ENGINEERING						
S. No.	Course Code	Course Title	Hours per Week			Credits
			L	T	P	
1		Transportation System Planning	3	1	0	4
2		Intelligent Transportation Systems	3	1	0	4
3		Elective-I	3	1	0	4
4		Elective-II	3	1	0	4
5		Elective-III	3	1	0	4

S. No.	Course Code	Elective-I	S. No.	Course Code	Elective-II	S. No.	Course Code	Elective-III
1		Software Applications in Transportation Engineering	1		Traffic Flow Theory	1		Artificial Intelligence for Remotely Sensed Image Processing and GIS
2		Principles of Transportation Systems	2		Highway Geometric Design	2		Soft Computing Methods in Engineering Problem Solving
3		Logistics Transportation Systems	3		Intersection Design	3		Optimization Methods in Civil Engineering

POOL III-GEOTECHNICAL ENGINEERING						
S. No.	Course Code	Course Title	Hours per Week			Credits
			L	T	P	
1		Geotechnical Earthquake Engineering	3	1	0	4
2		Rock Engineering	3	0	2	4
3		Elective-I	3	1	0	4
4		Elective-II	3	1	0	4
5		Elective-III	3	1	0	4

S. No.	Course Code	Elective-I	S. No.	Course Code	Elective-II	S. No.	Course Code	Elective-III
1		Ground Improvement	1		Earth and Earth Retaining Structures	1		Advanced Foundation Engineering
2		Finite Element in Geotechnical Engineering	2		Geo-technology for climate change and sustainable development	2		Theory of Elasticity and Plasticity
3		Clay Mineralogy and Expansive soil	3		Stability analysis of soil and rock slopes	3		Soft Computing Methods in Engineering Problem Solving

IV-ENVIRONMENTAL ENGINEERING						
S. No.	Course Code	Course Title	Hours per Week			Credits
			L	T	P	
1		Physicochemical Processes for Water & Waste Water Treatment	3	1	0	4
2		Environmental Chemistry & Microbiology	3	1	0	4
3		Elective-I	3	1	0	4
4		Elective-II	3	1	0	4
5		Elective-III	3	1	0	4

S. No.	Course Code	Elective-I	S. No.	Course Code	Elective-II	S. No.	Course Code	Elective-III
1		Principles of Biological Wastewater Treatment	1		Hazardous Waste Management	1		Soft Computing Methods in Engineering problem Solving
2		Rural Water Supply & Wastewater Disposal	2		Air and Water Quality Modelling	2		Design of Environmental Engineering Structures
3		Advance Wastewater Treatment	3		Groundwater Contamination and Pollution Transport	3		Artificial Intelligence for Remotely Sensed Image Processing and GIS

POOL OF COURSES FOR PROFESSIONAL ELECTIVE-I (III Year 6th Semester)

S. No.	Course Code	Course Title	Hours per Week			Credits
			L	T	P	
1	CE****	Prestressed Concrete	3	0	0	3
2	CE****	Precast and Modular Construction	3	0	0	3
3	CE****	Geotechnical Processes	3	0	0	3
4	CE****	Geotechnical Explorations	3	0	0	3
5	CE****	Air & Noise Pollution Control	3	0	0	3
6	CE****	Environmental Impact Assessment	3	0	0	3
7	CE****	Rural Roads	3	0	0	3
8	CE****	Astronomy and Photogrammetry	3	0	0	3
9	CE****	Open Channel Hydraulics	3	0	0	3
10	CE****	Isotope applications in Water Resource Management	3	0	0	3

POOL OF COURSES FOR PROFESSIONAL ELECTIVE-II (IV Year 7th Semester)

S. No.	Course Code	Course Title	Hours per Week			Credits
			L	T	P	
1	CE****	Bridge Engineering	3	0	0	3
2	CE****	Construction Equipments & Techniques	3	0	0	3
3	CE****	Repair and Retrofitting of Structures	3	0	0	3
4	CE****	Environmental Geotechnology	3	0	0	3
5	CE****	Geosynthetics	3	0	0	3
6	CE****	Industrial Wastewater Treatment & Reuse	3	0	0	3
7	CE****	Solid & Biomedical Waste Management	3	0	0	3
8	CE****	Transport Asset Management	3	0	0	3
9	CE****	Geological Studies for Rock Cut Slope Stability Analysis	3	0	0	3
10	CE****	Water Resources Systems Management	3	0	0	3

MINOR OPTIONS FOR OTHER DEPARTMENT STUDENTS (Offered in 4th, 5th & 6th)

* Credit Requirement: Minimum 16 credits

OPTION 1- Minors in “AI and IoT based Infrastructure Management”

S. No.	Course Code	Course Title	Hours per Week			Credits	Prerequisite	Remarks
			L	T	P			
1	CE****	Internet of Things and Sensors	3	1	0	4	Nil	Compulsory
2	CE****	Geoinformatics	3	1	0	4	Nil	Compulsory
3	CE****	BIM and Infrastructure Management	3	1	0	4	Nil	Compulsory
4	CE****	Infrastructure Engineering	2	1	0	3	Nil	Compulsory
5	CE****	Elective				3	Nil	To be selected from elective pool
Total						18		

ELECTIVE for Minors I (Student has to opt for any one of the courses listed below)

S. No.	Course Code	Course Title	Hours per Week			Credits	Prerequisite	Remarks
			L	T	P			
1	CE****	Building Engineering-I	2	0	2	3	Nil	Elective
2	CE****	Transport Asset Management	3	0	0	3	Nil	Elective

OPTION 2- Minors in “Smart Cities”

S. No.	Course Code	Course Title	Hours per Week			Credits	Prerequisite	Remarks
			L	T	P			
1	CE****	Sustainable Environmental Planning and Management for Urban Settlements	3	1	0	4	Nil	Compulsory
2	CE****	Energy Efficient Construction	3	1	0	4	Nil	Compulsory
3	CE****	Geoinformatics	3	1	0	4	Nil	Compulsory
4	CE****	Sustainable Urban Habitat	2	1	0	3	Nil	Compulsory
5	CE****	Elective				3	Nil	To be selected from elective pool
Total						18		

ELECTIVE for Minors II (Student has to opt for any one of the courses listed below)

S. No.	Course Code	Course Title	Hours per Week			Credits	Prerequisite	Remarks
			L	T	P			
1	CE****	Infrastructure Engineering	2	1	0	3	Nil	Elective
2	CE****	Introduction to Transportation Systems	2	1	0	3	Nil	Elective