Indian Institute of Engineering Science and Technology, Shibpur

Specialization wise Course Structure for Two-Year M. Tech Program in the Department of Civil Engineering

1. Water Resources Engineering (From 2019 Onward)

1st Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	Paper I: Advanced Hydrology and Stochastic Analysis	CE 5113	3	0	0	3	3	100
2.	Paper II: Applied Hydrodynamics and Numerical Modeling	CE 5114	3	0	0	3	3	100
3.	Paper III: Water Resources Management with Remote Sensing, GIS and spatial statistics	CE 5115	3	0	0	3	3	100
4.	Paper IV: (Dep. Elective)		3	0	0	3	3	100
5.	Paper V: (Open Elective)		3	0	0	3	3	100
	Theory Sub-total		15	0	0	15	15	500
6.	Advanced Hydrology Lab	CE5183	0	0	3	2	3	50
7.	Computer Applications in Hydrodynamics and Hydrology	CE5184	0	0	3	2	3	50
8.	Remote Sensing and GIS Lab	CE5185	0	0	3	2	3	50
	Practical Sub-total		NIL	NIL	9	6	9	150
	1st Semester Total					21	24	650

2nd Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	Paper VI: Water Resources Planning and Management	CE5213	3	0	0	3	3	100
2.	Paper VII: Ground Water Hydrology and Water Resources Development	CE5214	3	0	0	3	3	100
3.	Paper VIII: Hydrology of Extreme Events and Mitigation Measures	CE5215	3	0	0	3	3	100
4.	Paper IX (Dep. Elective)		3	0	0	3	3	100
5.	Paper X (Open Elective)		3	0	0	3	3	100
	Theory Subtotal		10	1	0	15	15	500
6.	M. Tech Project Part - I (Term Paper)	CE5291	0	0	2	4	2	200
7.	Term Paper Seminar & Viva-voce	CE5292	0	0	0	2	0	100
	Practical Subtotal		0	0	0	6	0	300
	2nd Semester Total					21	17	800

3rd Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load / Week	Marks
			L	T	P			
1.	M. Tech Project Part - II (Progress Report)	CE6191	0	0	0	12	0	300
2.	Progress Report Seminar & Viva-voce	CE6192	0	0	0	6	3	100
	Total Credit		0	0	0	18	0	
	3rd Semester Total					18	0	400

4th Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load / Week	Marks
			L	T	P			
1.	M. Tech Project Part - III (Thesis)	CE6291	0	0	0	22	0	400
2.	Thesis seminar and viva voce	CE6292	0	0	0	8	0	200
	Total Credit		0	0	0	30	0	
	4th Semester Total					30	0	600

Paper IV [Departmental elective]	**Paper V [Open elective]**	**Paper IX [Departmental elective]**
CE5153 Climate Modeling in Water Resources CE5154 Advanced Hydraulic Structures CE 5155 Irrigation and Drainage Engineering CE5156 Soft Computing in Water Resources CE5157 Watershed Management and Sustainable Development CE5158 Hydropower Development CE5159 Spatial Statistics and GIS Modeling CE5160 Isotope Hydrology	CE5161 Climate Change Impact Analysis	CE5253 Loose Boundary Hydraulics and Sediment Transport CE5254 Storm water Management CE5255 Coastal Hydraulics and Port Management CE5256 Optimization and Simulation in Water Resources CE5257 River Mechanics and Control Structures CE5258 Environmental Hydraulics

2. **Transportation Engineering,** (From 2019 Onward)

1st Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	Paper I: Pavement Engineering I	CE 5107	3	0	0	3	3	100
2.	Paper II: Traffic System Analysis	CE 5108	3	0	0	3	3	100
3.	Paper III: Urban Transportation Planning	CE 5109	3	0	0	3	3	100
4.	Paper IV: (Dep. Elective)		3	0	0	3	3	100
5.	Paper V: (Open Elective)		3	0	0	3	3	100
	Theory Sub-total		15	0	0	15	15	500
6.	Pavement Material Laboratory	CE5177	0	0	3	2	3	50
7.	Traffic System Laboratory	CE5178	0	0	3	2	3	50
8.	Mini project on Software Application in Transportation Engineering	CE5179	0	0	3	2	3	50
	Practical Sub-total		NIL	NIL	9	6	9	150
	1st Semester Total					21	24	650

2nd Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	Paper VI: Pavement Engineering II	CE5207	3	0	0	3	3	100
2.	Paper VII: Traffic System Design and Management	CE5208	3	0	0	3	3	100
3.	Paper VIII: Transport Economics and Project Evaluation	CE5209	3	0	0	3	3	100
4.	Paper IX (Dep. Elective)		3	0	0	3	3	100

5.	Paper X (Open Elective)		3	0	0	3	3	100
	Theory Subtotal		10	1	0	15	15	500
6.	M. Tech Project Part - I (Term Paper)	CE5291	0	0	2	4	2	200
7.	Term Paper Seminar & Viva-voce	CE5292	0	0	0	2	0	100
	Practical Subtotal		0	0	0	6	0	300
	2nd Semester Total					21	17	800

3rd Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	M. Tech Project Part - II (Progress Report)	CE6191	0	0	0	12	0	300
2.	Progress Report Seminar & Viva-voce	CE6192	0	0	0	6	3	100
	Total Credit		0	0	0	18	0	
	3rd Semester Total					18	0	400

4th Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	M. Tech Project Part - III (Thesis)	CE6291	0	0	0	22	0	400
2.	Thesis seminar and viva voce	CE6292	0	0	0	8	0	200
	Total Credit		0	0	0	30	0	
	4th Semester Total					30	0	600

Paper IV [Departmental elective]	**Paper IX [Departmental elective]**
CE5137 Geometric Design and Road Safety CE5138 Analytical Techniques in Transportation Engineering CE5139 Geospatial Techniques in Transportation CE5140 Airport Planning and Design	CE5237 Pavement Evaluation and Asset Management CE5238 Advanced Pavement Design and Construction Materials CE5239 Intelligent Transportation Systems CE5240 Transportation in Logistics Management

3. **Structural Engineering,** (From 2019 Onward)

1st Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	Paper I: Advanced Solid Mechanics	CE 5101	3	0	0	3	3	100
2.	Paper II: Computational Methods in Structural Analysis	CE 5102	3	0	0	3	3	100
3.	Paper III: Design of special reinforced Concrete Structures	CE 5103	3	0	0	3	3	100
4.	Paper IV: (Dep. Elective)		3	0	0	3	3	100
5.	Paper V: (Open Elective)		3	0	0	3	3	100
	Theory Sub-total		15	0	0	15	15	500
6.	Structural Engineering Laboratory	CE5171	0	0	3	2	3	50
7.	Structural Analysis and Design Software Laboratory	CE5172	0	0	3	2	3	50
8.	Mini Project on Analysis and Design of Special Structures	CE5173	0	0	3	2	3	50
	Practical Sub-total		NIL	NIL	9	6	9	150
	1st Semester Total					21	24	650

2nd Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	Paper VI: Advanced Structural Mechanics	CE5201	3	0	0	3	3	100
2.	Paper VII: Structural Dynamics	CE5202	3	0	0	3	3	100
3.	Paper VIII: Design and Behavior of Metal Structures	CE5203	3	0	0	3	3	100
4.	Paper IX (Dep. Elective)		3	0	0	3	3	100
5.	Paper X (Open Elective)		3	0	0	3	3	100
	Theory Subtotal		10	1	0	15	15	500
6.	M. Tech Project Part - I (Term Paper)	CE5291	0	0	2	4	2	200
7.	Term Paper Seminar & Viva-voce	CE5292	0	0	0	2	0	100
	Practical Subtotal		0	0	0	6	0	300
	2nd Semester Total					21	17	800

3rd Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	M. Tech Project Part - II (Progress Report)	CE6191	0	0	0	12	0	300
2.	Progress Report Seminar & Viva-voce	CE6192	0	0	0	6	3	100
	Total Credit		0	0	0	18	0	
	3rd Semester Total					18	0	400

4th Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	M. Tech Project Part - III (Thesis)	CE6291	0	0	0	22	0	400
2.	Thesis seminar and viva voce	CE6292	0	0	0	8	0	200
	Total Credit		0	0	0	30	0	
	4th Semester Total					30	0	600

Paper IV [Departmental elective]	**Paper IX [Departmental elective]**
CE 5121 Structural Optimization CE 5122 Pre-stressed Concrete Structures CE 5123 Advanced Concrete Technology CE 5124 Experimental Methods in Structural Engineering CE 5125 Non-linear Structural mechanics CE 5126 Soil Structure Interaction	CE 5221 Reliability Based Analysis and Design CE 5222 Offshore Structures CE 5223 Structures under Extreme Events CE 5224 Bridge Engineering CE 5225 Tall Structures CE 5226 Composite Material and Structures CE 5227 Condition Assessment and Retrofitting of Structures CE 5228 Structural Vibration Control

4. **Environmental Engineering,** (From 2019 Onward)

1st Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	Paper I: Chemistry for Environmental Engineering	CE 5110	3	0	0	3	3	100
2.	Paper II: Biological Processes in Wastewater Treatment	CE 5111	3	0	0	3	3	100
3.	Paper III: Physico-Chemical Processes in Water and Wastewater Treatment	CE 5112	3	0	0	3	3	100
4.	Paper IV: (Dep. Elective)		3	0	0	3	3	100
5.	Paper V: (Open Elective)		3	0	0	3	3	100
	Theory Sub-total		15	0	0	15	15	500
6.	Water Quality Analysis Lab	CE5180	0	0	3	2	3	50
7.	Physicochemical Process Lab	CE5181	0	0	3	2	3	50
8.	Biological Process Lab	CE5182	0	0	3	2	3	50
	Practical Sub-total		NIL	NIL	9	6	9	150
	1st Semester Total					21	24	650

2nd Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	Paper VI: Industrial Pollution Control	CE5210	3	0	0	3	3	100
2.	Paper VII: Air Pollution and Control	CE5211	3	0	0	3	3	100
3.	Paper VIII: Solid and Hazardous Waste Management	CE5212	3	0	0	3	3	100
4.	Paper IX (Dep. Elective)		3	0	0	3	3	100
5.	Paper X (Open Elective)		3	0	0	3	3	100
	Theory Subtotal		10	1	0	15	15	500
6.	M. Tech Project Part - I (Term Paper)	CE5291	0	0	2	4	2	200
7.	Term Paper Seminar & Viva-voce	CE5292	0	0	0	2	0	100
	Practical Subtotal		0	0	0	6	0	300
	2nd Semester Total					21	17	800

3rd Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	M. Tech Project Part - II (Progress Report)	CE6191	0	0	0	12	0	300
2.	Progress Report Seminar & Viva-voce	CE6192	0	0	0	6	3	100
	Total Credit		0	0	0	18	0	
	3rd Semester Total					18	0	400

4th Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	M. Tech Project Part - III (Thesis)	CE6291	0	0	0	22	0	400
2.	Thesis seminar and viva voce	CE6292	0	0	0	8	0	200
	Total Credit		0	0	0	30	0	
	4th Semester Total					30	0	600

Paper IV [Departmental elective]	**Paper IX [Departmental elective]**
CE5145 Rural Water Supply and Sanitation CE5146 Environmental Management and Legislation CE5147 Energy Evolution from Waste Material	CE5245 Process and Hydraulic Design of Water and Wastewater Systems CE 5246 Environmental Biotechnology

5. Geotechnical Engineering, (From 2019 Onward)

1st Semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	Paper I: Advanced Soil Mechanics	CE 5104	3	0	0	3	3	100
2.	Paper II: Foundation Engineering	CE 5105	3	0	0	3	3	100
3.	Paper III: Dynamics of Soilsand Machine Foundations	CE 5106	3	0	0	3	3	100
4.	Paper IV: (Dept. Elective)		3	0	0	3	3	100
5.	PaperV:(Open Elective)		3	0	0	3	3	100
	Theory Sub-total		15	0	0	15	15	500
6.	Advanced Geotechnical Engineering Laboratory	CE5174	0	0	3	2	3	50
7.	Geotechnical Model Laboratory	CE5175	0	0	3	2	3	50
8.	Advanced Geotechnical Engineering Project	CE5176	0	0	3	2	3	50
	Practical Sub-total		NIL	NIL	9	6	9	150
	1st Semester Total					21	24	650

2ndsemester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	Paper VI: Applied Geotechnical Engineering	CE5204	3	0	0	3	3	100
2.	Paper VII:Analysis and Design of Special Foundations	CE5205	3	0	0	3	3	100
3.	Paper VIII:Elasticity and Plasticity	CE5206	3	0	0	3	3	100
4.	Paper IX (Dep. Elective)		3	0	0	3	3	100
5.	PaperX (Open Elective)		3	0	0	3	3	100
	Theory Subtotal		10	1	0	15	15	500
6.	M. Tech Thesis (Term Paper)	CE5291	0	0	2	4	2	200
7.	Term Paper Seminar & Viva-voce	CE5292	0	0	0	2	0	100
	Practical Subtotal		0	0	0	6	0	300
	2nd Semester Total					21	17	800

3rdsemester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	M. Tech. Thesis (Progress Report)	CE6191	0	0	0	12	0	300
2.	Progress Report Seminar & Viva-voce	CE6192	0	0	0	6	3	100
	Total Credit		0	0	0	18	0	
	3rd Semester Total					18	0	400

4th semester

Sl. No	Course Name	Course code	Class Load/Week			Credit	Class load/ Week	Marks
			L	T	P			
1.	M. Tech. Thesis	CE6291	0	0	0	22	0	400
2.	Thesis seminar and viva voce	CE6292	0	0	0	8	0	200
	Total Credit		0	0	0	30	0	
	4th Semester Total					30	0	600

Paper IV [Departmental elective] CE 914	**Paper IX [Departmental elective] CE 1014**
CE5129 Ground improvement Techniques and applications CE5130 Rock mechanics CE5131 Unsaturated soil mechanics CE5132 Soil Exploration and Geo-Instrumentation CE5133 Geomechanics in Soil-Structure Interaction Ce5134 Computational Geotechnics CE5135 Risk and Reliability in Geotechnical Engineering	CE5229 Geotechnical Earthquake Engineering CE5230 Environmental Geotechnics CE5231 Physical modelling in Geotechnics CE5232 Offshore Geotechnics CE5233 Forensic Geotechnical Engineering CE5234 Tunnelling and Underground Space Technology