

## Birla Institute of Technology, Mesra, Ranchi

### Course Structure for B.Tech. (Civil Engineering)

Based on NEP-2020, CBCS and OBE, Effective from 2024-2025

Sr. No.	Semester of Study	Category of Course	Course Code	Subjects	Mode of delivery & Credits			Total Credits
					L (Periods/ Week)	T (Periods/ Week)	P (Periods/ Week)	
<b>FIRST</b>		<b>THEORY</b>						
I.1		FS	MA24101	Mathematics - I	3	1	0	4
I.2			PH24101	Physics	3	1	0	4
I.3			BE24101	Biological Sciences for Engineers	2	0	0	2
I.4		GE	CS24101	Programming for Problem Solving	3	1	0	4
I.5			EE24101	Basics of Electrical Engineering	2	1	0	3
		<b>LABORATORIES</b>						
I.6		FS	PH24102	Physics Laboratory	0	0	2	1
I.7		GE	CS24102	Programming for Problem Solving Laboratory	0	0	2	1
I.8			EE24102	Electrical Engineering Laboratory	0	0	2	1
I.9		HSS	HU24132	Communication Skill - I	0	0	3	1.5
I.10		MC	MC24 101/102/103 /104/105	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA) /Entrepreneurship	0	0	2	1
<b>TOTAL (Theory + Labs)</b>								<b>22.5</b>
<b>SECOND</b>		<b>THEORY</b>						
II.1		FS	MA24103	Mathematics - II	3	1	0	4
II.2			CH24101	Chemistry	3	1	0	4
II.3		GE	EC24101	Basic of Electronics and Communication Engineering	2	1	0	3
II.4			ME24101	Basics of Mechanical Engineering	2	1	0	3
II.5		FS	CE24101	Environmental Science	2	0	0	2
		<b>LABORATORIES</b>						
II.6		FS	CH24102	Chemistry Laboratory	0	0	2	1
II.7		GE	EC24102	Electronics and Communication Laboratory	0	0	2	1
II.8			ME24102	Engineering Graphics	0	0	4	2
I.9			PE24102	Workshop Practice	0	0	2	1
I.10		MC	MC24 106/107/108/1 09 /110	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA) /Entrepreneurship	0	0	2	1
<b>TOTAL (Theory + Labs)</b>								<b>22</b>
<b>GRAND TOTAL FOR FIRST YEAR</b>								<b>44.5</b>
<b>THIRD</b>		<b>THEORY</b>						
III.1		FS	MA24201	Numerical Methods	2	0	0	2
III.2		PC	CE24201	Solid Mechanics	4	0	0	4
III.3			CE24202	Structural Analysis - I	3	0	0	3
III.4			CE24203	Fluid Mechanics	4	0	0	4
III.5			CE24204	Building Materials and Construction	3	0	0	3
III.6		HSS	MT24131	UHV-II: Understanding Harmony	3	0	0	3
		<b>LABORATORIES</b>						
III.7		FS	MA24202	Numerical Methods Laboratory	0	0	2	1
III.8		PC	CE24205	Civil Engineering Drawing	0	0	4	2
III.9			CE24206	Fluid Mechanics Laboratory	0	0	2	1
III.10		MC	MC24 201/202/203/2 04 /205	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA) / Entrepreneurship	0	0	2	1
<b>TOTAL (Theory + Labs)</b>								<b>24</b>
<b>FOURTH</b>		<b>THEORY</b>						
IV.1		PC	CE24207	Structural Analysis - II	3	0	0	3
IV.2			CE24208	Surveying	3	0	0	3
IV.3			CE24209	Construction Engineering and Management	3	0	0	3
IV.4			CE24210	Earthquake Engineering and Disaster	2	0	0	2
IV.5		PE	CE2425X	Elective - I	3	0	0	3
IV.6	OE	XX24XXX/ MO24201	Open Elective - I/ MOOC - I	3	0	0	3	
IV.7	MC	HU24211	Indian Knowledge System				0	
		<b>LABORATORIES</b>						
IV.8		PC	CE24211	Structural Engineering Laboratory - I	0	0	2	1
IV.9			CE24212	Surveying Field Work	0	0	4	2
IV.10			CE24213	Specifications Estimation and Costing	1	0	2	2

IV.11		CE24214	Solid Mechanics Laboratory	0	0	2	1
IV.12	MC	MC24 206/207/208/2 09/210	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA) / Entrepreneurship	0	0	2	1
TOTAL (Theory + Labs)							<b>24</b>
<b>GRAND TOTAL FOR SECOND YEAR</b>							<b>48</b>
<b>FIFTH</b>							
<b>THEORY</b>							
V.1	PC	CE24301	Structural Design - I	4	0	0	4
V.2		CE24302	Water Resources Engineering	3	0	0	3
V.3		CE24303	Geotechnical Engineering	3	0	0	3
V.4		CE24304	Environmental Engineering	3	0	0	3
V.5		CE24305	Transportation Engineering	3	0	0	3
V.6	OE	XX24XXX/ MO24301	Open Elective - II / MOOC - II	3	0	0	3
<b>LABORATORIES</b>							
V.7	PC	CE24306	Water Resources Engineering Laboratory	0	0	2	1.0
V.8		CE24307	Environmental Engineering Laboratory	0	0	2	1.0
V.9	HSS	HU24133	Communication Skill - II	0	0	3	1.5
V.10	PC	CE24300	Project - I				2
TOTAL (Theory + Labs)							<b>24.5</b>
<b>SIXTH</b>							
<b>THEORY</b>							
VI.1	PC	CE24308	Structural Design - II	4	0	0	4
VI.2	PE	CE2435X	Elective - II	3	0	0	3
VI.3		CE2435X	Elective - III	3	0	0	3
VI.4		CE2435X	Elective - IV	3	0	0	3
VI.5	OE	XX24XXX/ MO24303	Open Elective - III / MOOC - III	3	0	0	3
<b>LABORATORIES</b>							
VI.6	PC	CE24309	Structural Engineering Laboratory - II	0	0	2	1
VI.7		CE24310	Computer Aided Analysis and Design	1	0	2	2
VI.8		CE24311	Geotechnical Engineering Laboratory	0	0	2	1
VI.9		CE24312	Transportation Engineering Laboratory	0	0	2	1
VI.10		CE24350	Project - II				2
TOTAL (Theory + Labs)							<b>23</b>
<b>GRAND TOTAL FOR THIRD YEAR</b>							<b>47.5</b>
<b>SEVENTH</b>							
<b>THEORY</b>							
VII.1	PE	CE2445X	Elective - V	3	0	0	3
VII.2		CE2445X	Elective - VI	3	0	0	3
VII.3		CE2445X	Elective - VII	3	0	0	3
VII.4	OE	XX24XXX/ MO24401	Open Elective - IV / MOOC - IV	3	0	0	3
VII.5	HSS	MT24204	Constitution of India	2	0	0	0
<b>LABORATORIES</b>							
VII.6	PC	CE24402	Remote Sensing and GIS Laboratory	0	0	2	1
VII.7		CE24403	Advanced Instrumentation Laboratory	0	0	2	1
VII.8	MC	MC24300	Summer Training (Minimum Four Weeks / 160 Hrs)				4
VII.9	PC	CE24400	Project - III				3
TOTAL (Theory + Labs)							<b>21</b>
VIII.1	<b>EIGHTH</b>	PC	CE24450/ CE24490	Project-IV / Industry Internship			6
VIII.2		CE24498	Comprehensive Viva				1
TOTAL (Theory + Labs)							<b>7</b>
<b>GRAND TOTAL FOR FOURTH YEAR</b>							<b>28</b>
<b>GRAND TOTAL FOR B.TECH.</b>							<b>168</b>

Programme Electives for Students of B.Tech. (Civil Engineering)								
Sr. No.	Semester of Study (Recommended)	Category of Course	Course Code	Subjects	Mode of delivery & Credits <i>L-Lecture; T-Tutorial; P-Practical</i>			Total Credits
					L (Periods/Week)	T (Periods/Week)	P (Periods/Week)	
PE1	FOURTH	PE	CE24251	Advanced Solid Mechanics	3	0	0	3
			CE24252	Concrete Technology	3	0	0	3
			CE24253	Open Channel Hydraulics	3	0	0	3
PE2	SIXTH	PE	CE24351	Advanced Structural Analysis	3	0	0	3
			CE24352	Finite Element Method	3	0	0	3
			CE24353	Structural Dynamics	3	0	0	3
PE3	SIXTH	PE	CE24354	Transportation Planning	3	0	0	3
			CE24355	Traffic Engineering and Management	3	0	0	3
			CE24356	Harbour and Airport Engineering	3	0	0	3
PE4	SIXTH	PE	CE24357	Air Pollution and Control	3	0	0	3
			CE24358	Solid Waste Management	3	0	0	3
			CE24359	Environmental Impact Assessment	3	0	0	3
PE5	SEVENTH	PE	CE24451	Pre-stressed Concrete	3	0	0	3
			CE24452	Advanced Concrete Structures Design	3	0	0	3
			CE24453	Advanced Steel Structures Design	3	0	0	3
PE6	SEVENTH	PE	CE24454	Advanced Surveying	3	0	0	3
			CE24455	Advanced Soil Mechanics	3	0	0	3
			CE24456	Foundation Engineering	3	0	0	3
PE7	SEVENTH	PE	CE24457	Remote Sensing in Civil Engineering	3	0	0	3
			CE24458	Groundwater Engineering	3	0	0	3
			CE24459	Design of Hydraulic Structures	3	0	0	3

Open Electives Offered by Department of Civil and Environmental Engineering for Students of Other Departments								
Sr. No.	Semester of Study (Recomended)	Category of Course	Course Code	Subjects	Mode of delivery & Credits <i>L-Lecture; T-Tutorial; P-Practical</i>			Total Credits
					L (Periods/Week)	T (Periods/Week)	P (Periods/Week)	
OE1	FOURTH	OE	CE24291	Building Construction	3	0	0	3
OE2	FIFTH		CE24391	Environmental Managemen	3	0	0	3
OE3	SIXTH		CE24392	Disaster Mangement	3	0	0	3
OE4	SEVENTH		CE24491	Construction Management	3	0	0	3

Vocational Courses  
After Completion of First Year of B.Tech.

Sr. No.	Category of Course	Course Code	Subjects	Mode of delivery & Credits			Total Credits
				L-Lecture	T-Tutorial	P-Practical	
1	VOC1	CE24151	Building Drawing	1	0	2	3
2	VOC2	CE24152	Surveying	1	0	2	3

After Completion of Second Year of B.Tech. (Civil Engineering)

Sr. No.	Category of Course	Course Code	Subjects	Mode of delivery & Credits			Total Credits
				L-Lecture	T-Tutorial	P-Practical	
1	VOC3	CE24251	Cement Concrete and Road Materials	1	0	2	3
2	VOC4	CE24252	Soil Investigations and Testing	1	0	2	3