

Bachelor of Technology in Civil and Infrastructure Engineering

Indian Institute of Technology Dharwad is starting a four year B.Tech. program in Civil and Infrastructure Engineering from the academic year 2022. Senior secondary students who qualify in the JEE Advanced examination are eligible to apply.

- 1) The curriculum is designed after the careful consideration of the requirements of subjects/courses that would make a wholesome engineering student
- 2) The entire focus has been to transfer knowledge on engineering principles, concepts, current developments & practices in a structured manner providing ample opportunity to take electives from a basket of courses permitting interdisciplinary learning and provision for internship, industry interaction, etc.
- 3) The knowledge transfer should facilitate the student to enhance their skills, opportunities for employment and plan for their own startup as per student's choice
- 4) All of the above is embedded by balancing the number of modules per course and the number of hours of classroom teaching, laboratory and tutorials

The first year (First & Second semesters):

The first year of study can build the basic science and mathematical skills needed for the practice of civil & infrastructure engineering. Physics, chemistry, mathematics/numerical methods through the concepts of differential equations and mechanics give a solid foundation in problem solving and analytical thinking, which are essential for civil & infrastructure engineering students. This interdisciplinary approach, favored by industry, facilitates switching to another engineering discipline at the end of first semester, if needed.

The second year (Third & Fourth semesters):

The second year offers students a range of courses within civil engineering and engineering economics & HSS electives. Courses like fluid mechanics, mechanics of materials and building & construction materials introduce fundamental principles & practical applications of civil engineering. Considerable emphasis to be placed on laboratory & testing leading to understanding & appreciation to practice. It includes site visits, laboratory classes, physical modelling, & surveying fieldwork (carefully planned during non-monsoon days) using most modern tools, instruments and applications.

The Third Year (fifth & sixth semesters):

The third year is built on the basic civil engineering design courses. These courses provide fundamental knowledge in areas of civil engineering design structural, water resources, geotechnical, transportation and environmental engineering. Hands-on laboratory tests will build practical skills and strengthen the concepts from these design courses.

The Final Year (seventh & eighth semesters):

The final year facilitates the students to pick up from a basket of elective courses corresponding to the specialized tracks & other department electives. Seven separate specialization tracks

available. *Students may configure their electives to provide specialization in the seven sub- disciplines, as detailed below:*

- *Structural Engineering*
- *Geotechnical Engineering*
- *Transportation Engineering & City/Urban Planning*
- *Construction Engineering & Facilities Management*
- *Environmental Engineering*
- *Hydraulics Engineering*
- *Hydrology & Water Resources Engineering*

Students may pursue by choosing any relevant technical electives. These elective courses provide students a deeper understanding of some of the topics he/she would like to further pursue. The experience that will be gained by eligible students through projects being taken up by associating with either an industry or an organization will open up opportunities to plan and pursue the interest of the student with confidence.

B. Tech Curriculum

I Semester

Course Code	Course Name	L	T	P	Total Credits
CS xxx	Introduction to Programming-I	2	1	0	4
EE xxx	Introduction to Programming-II	2	1	0	4
CH 101	Fundamental Aspects & Applications of Chemistry	3	0	0	6
MA xxx	Calculus-I	3	1	0	4
MA xxx	Calculus-II	3	1	0	4
PH 101	Quantum Physics and Applications	2	1	0	6
BB 101	Introduction to Modern Biology	3	0	0	6
	Hands-on Science Lab	0	0	3	3
HS 101	Introduction to Fine Arts				(P/NP)
	Design Thinking and Creativity				(P/NP)
NSO 101	Sports				P/NP
	Total number of credits				37

II Semester

Course Code	Course Name	L	T	P	Total Credits
CE xxx	Introduction to Civil Engineering	2	1	0	6
CS 201	Data Structures & Algorithms	3	0	0	6
CS 211	Data Structures & Algorithms Lab	0	0	3	3
MA 103	Differential Equations (First Half Semester)	3	1	0	4
MA 206	Introduction to Numerical Methods (Second Half Semester)	3	1	0	4
ME 201	Engineering Mechanics	2	1	0	6
ME 111	Engineering Graphics Lab	0	1	3	5
ME xxx	Hands-on Engineering Lab	0	0	3	3
	NSO				(P/NP)
	Total Number of Credits				37

III Semester

Course code	Course name	L	T	P	Total Credits
ME xxx	Fluid Mechanics	2	1	0	6
ME xxx	Mechanics of Materials	2	1	0	6
CE xxx	Instrumentation, Sensors Technologies & IoT in CE	1	1	2	6
CE xxx	Transportation Engineering-I	2	1	0	6
CE xxx	Transportation Engineering-I Lab.	0	0	3	3
EE 227	Data Analysis	3	0	0	3
EE 221	Introduction to Probability	3	0	0	3
HS xxx	Communication Skills				P/NP
CE xxx	Civil Engineering Credit Seminar	0	0	3	3
	Total number of credits				36

IV Semester

Course Code	Course Name	L	T	P	Total Credits
CE xxx	Hydraulics Engineering	2	1	0	6
CE xxx	Structural Mechanics	2	1	0	6
CE xxx	Surveying & Geomatics	2	1	0	6
ME xxx	Solid Mechanics Lab	0	0	3	3
ME xxx	Fluid Mechanics Lab	0	0	3	3
CE xxx	Surveying & Geomatics Lab.	0	0	3	3
CE xxx	Hydraulics Engineering Lab.	0	0	3	3
CE xxx	Building Materials & Construction	2	1	0	6
	Total number of credits				36

Fourth Semester Summer Internship – Optional
**Summer research internship at IITDh or any
other institute in India**

V Semester

Course code	Course name	L	T	P	Total Credits
	Institute Elective-I	2	1	0	6
CE xxx	Structural Design-I (RCC/Prestressed)	2	1	0	6
CE xxx	Geotechnical Engineering -I	2	1	0	6
	Institute Elective-II	2	1	0	6
HS 201	Economics	3	0	0	6
CE xxx	Geotechnical Engg. Lab-I	0	0	3	3
CE xxx	Building & Construction Materials Testing Lab.	0	0	3	3
CE xxx	Structural Engg. Lab.-I	0	0	3	3
Total number of credits					39

VI Semester

Course Code	Course Name	L	T	P	Total Credits
CE xxx	Water Resources Engg.	2	1	0	6
CE xxx	Climate & Environmental Engineering	2	1	0	6
CE xxx	Estimation and Costing of Engineered Structures	0	0	3	3
CE xxx	Structural Design-II (Metal/Steel/Composites)	2	1	0	6
CE xxx	Structural Engg. Lab.-II	0	0	3	3
CE xxx	Foundation Engg. (Half semester)	1	0	1	3
	Institute Elective-III	2	1	0	6
	HSS Elective-I [from Basket: 1 OR 2] (Professional/Applied Ethics)	2	1	0	6
	Total number of credits				39

VII Semester

Course Code	Course Name	L	T	P	Total Credits
CE xxx	Construction Engineering & Management	2	1	0	6
	Institute Elective-IV	2	1	0	6
	Institute Elective-V	2	1	0	6
	HSS Basket1 or 2 (Elective-I)	2	1	0	6
CE xxx	BTP-I/Program Elective-I	2	1	0	6
	Total number of credits				30

VIII Semester

Course Code	Course Name	L	T	P	Total Credits
CE xxx	BTP-II/Program Elective-II	2	1	0	6
	Total number of credits				6

Seventh & Eighth Semesters: BTP – Conditional

12 Credits (12) based (Conditional, see notes) BTP:
Industry Internship in India (or)
Internship at Universities abroad (or)
Interdisciplinary Research internship at IITDh

- ***BTP can be done in the Institute or in the Industry ONLY by students who have secured CPI of 7 and above or by mutual consent with the concerned faculty.***
- ***Otherwise, students are required to take courses totaling to at least 12 credits from the department elective basket of six streams***

Semester wise Credit Break-up

Semester	Credits
I	37
II	37
III	36
IV	36
Summer Internship (Optional)	
V	39
VI	39
VII	30
VIII	6

Seventh & Eighth Semesters: Basket of Departmental Electives

Electives for VII & VIII Semesters

S. No	Course Code	Course Name	No of Credits
Common to all CE Tracks			
1	CE xxx	Contract Management	6
2	CE xxx	Disaster Management in CE	6
3	CE xxx	Engineering Geology	6
4	CE xxx	Probability & Statistics for CE	6
Transportation Engineering & City/Urban Planning			
1	CE xxx	Railways and Airport Engineering	6
2	CE xxx	Pavement Systems Engineering	6
3	CE xxx	Traffic Engineering	6
4	CE xxx	Urban Transportation Systems Planning	6
5	CE xxx	Urban Planning in India: Theory, Challenges and Approaches	6
Construction Engineering & Facilities Management			
1.	CE xxx	Concrete Technology	6
2.	CE xxx	Functional Design of Buildings	6
3.	CE xxx	Construction Contracts	6
4.	CE xxx	Quality and Safety in Construction	6
5.	CE xxx	Condition Assessment and Rehabilitation of Constructed Facilities	6

Environmental Engineering			
1.	CE xxx	Water and Wastewater Engineering	6
2.	CE xxx	Solid Waste Management	6
3.	CE xxx	Air Pollution Science and Engg.	6
4.	CE xxx	Environmental Biotechnology	6
5.	CE xxx	Environmental Management or Environmental Law and Policy	6
Hydraulics Engineering			
1.	CE xxx	Hydraulic Machinery	6
2.	CE xxx	Hydraulic Structures	6
3.	CE xxx	Hydraulic Modelling - Physical and Numerical	6
Hydrology & Water Resources Engineering			
1.	CE xxx	Introduction to Geomatics	6
2.	CE xxx	Advanced Hydrology	6
3.	CE xxx	Ground Water Engineering	6
4.	CE xxx	Water Resources Systems Engineering	6
5.	CE xxx	Irrigation Systems Engineering	6
Structural Engineering			
1.	CE xxx	Advanced Solid Mechanics	6
2.	CE xxx	Structural Design	6
3.	CE xxx	Introduction to Earthquake Engineering	6
4.	CE xxx	Prestressed Concrete Design	6
5.	CE xxx	Finite Element Methods	6

Geotechnical Engineering

1.	CE xxx	Geotechnical Engineering-II	6
2.	CE xxx	Soil Dynamics	6
3.	CE xxx	Foundation Engineering-II	6
4.	CE xxx	Geotechnical Earthquake Engineering	6
5.	CE xxx	Environmental Geotechnology	6
6.	CE xxx	Rock Mechanics	6
7.	CE xxx	Ground Improvement	6
8.	CE xxx	Risk Assessment & Management in Geotechnical Engineering	6