

COURSE LIST - DEPARTMENT OF CIVIL ENGINEERING

B.Tech Civil Engineering - NEP Course Structure (Batch 2024 onward)

Prepared in the format of the existing department template, with the same PO and PSO definitions and an academically aligned course-mapping matrix for the revised NEP structure.

Semester 1

Course Code	Course Title	Course Number
BTUH0001	Student Induction Program - Universal Human Values I	1.1
CHCY118T	Chemistry I	1.2
MAMT113T	Mathematics I	1.3
EEEL100T	Basic Electrical Engineering	1.4
BOBE113T	Biology for Engineers	1.5
CHCY119L	Chemistry Lab	1.6
EEEL101L	Basic Electrical Engineering Lab	1.7
MNWM100L	Workshop/Manufacturing Practices	1.8
MNDI101L	Design Thinking and Idea Lab	1.9

Semester 2

Course Code	Course Title	Course Number
PSEP109T	Engineering Physics	2.1
MAMT114T	Mathematics II	2.2
CSPS100T	Programming for Problem Solving	2.3
EGTW107T	English for Technical Writing	2.4
CVGD100T	Engineering Graphics and Design	2.5
PSEP110L	Engineering Physics Lab	2.6
CSPS101L	Programming for Problem Solving Lab	2.7
EGOP108L	Oral Communication Practice Lab	2.8
BTUH0002	Universal Human Values II	2.9
BTSY0003	Sports and Yoga or NSS/NCC	2.10

Semester 3

Course Code	Course Title	Course Number
CVMS204T	Mechanics of Solids	3.1
CVMC205T	Mathematics to Civil Engineering-I	3.2
CVCE206T	Civil Engineering Materials and Concrete Technology	3.3
CVFM207T	Fluid Mechanics	3.4
ECIK201T	IKS II - Indian and Indigenous Knowledge System	3.5
CVBP201P	Building Planning and Computer-aided Civil Engineering Drawing Lab	3.6
CVCE202P	Civil Engineering Materials and Concrete Technology Lab	3.7
CVFM203P	Fluid Mechanics Lab	3.8
CVIA208T	Internship Activity	3.9

Semester 4

Course Code	Course Title	Course Number
CVTE221T	Transportation Engineering	4.1
CVSA222T	Surveying and Geomatics	4.2
CVGE223T	Geotechnical Engineering	4.3
CVHE224T	Hydraulic Engineering	4.4
CVSA225T	Structural Analysis	4.5
CVCE226T	Construction Engineering & Management	4.6
CVTE227P	Transportation Engineering Lab	4.7
CVSA228P	Surveying and Geomatics Lab	4.8
CVGE229P	Geotechnical Engineering Lab	4.9
CVHE230P	Hydraulic Engineering Lab	4.10
CVSM231P	Solid Mechanics and Structural Analysis Lab	4.11
CVCE232T	Civil Engineering - Societal & Global Impact	4.12
COI	Constitution of India	4.13

Semester 5

Course Code	Course Title	Course Number
CVSD338T	Structural Design-I	5.1
CVEE339T	Environmental Engineering	5.2
CVEE340T	Engineering Economics, Estimation & Costing	5.3
CVHW341T	Hydrology & Water Resources Engineering	5.4
CVSA342T	Structural Analysis-I	5.5
CVRA343T	Railway & Airport Engineering	5.6
CVER344T	Earth Retaining Structure	5.7
CVOC345T	Open Channel Flow	5.8
CVCM346T	Multidisciplinary Open Elective - I	5.9
CVSD347P	Structural Design-I Lab	5.10
CVEE348P	Environmental Engineering Lab	5.11
CVPP349T	Professional Practice, Law & Ethics	5.12
SLT	Service Learning - Theory	5.13
CVIN392P	Internship	5.14

Semester 6

Course Code	Course Title	Course Number
CVSD351T	Structural Design-II	6.1
CVIT352T	Intelligent Transportation Systems	6.2
CVSA353T	Sustainable and Green Construction	6.3
CVAS354T	Advanced Structural Analysis	6.4
CVRE355T	River Engineering	6.5
CVFE356T	Foundation Engineering	6.6
CVSH357T	Surface Hydrology	6.7
CVSC358T	Sustainable Construction Methods	6.8
CVSD359P	Structural Design-II Lab	6.9
EEIS321T	Instrumentation & Sensor Technologies for Civil Engineering Applications	6.10
CVSC361P	Survey Camp	6.11
SLF	Service Learning - Field Work	6.12

Semester 7

Course Code	Course Title	Course Number
CVRA468T	Robotics and Automation	7.1
CVGI469T	Ground Improvement Techniques	7.2
CVTE470T	Traffic Engineering & Management	7.3
CVSD471T	Structural Dynamics	7.4
CVRR472T	Repair & Rehabilitation of Structures	7.5
CVIN473P	Industrial Training	7.6
CVMP474P	Minor Project	7.7
CVDP475T	Disaster Preparedness & Planning	7.8

Semester 8

Course Code	Course Title	Course Number
CVEQ476T	Earthquake Engineering	8.1
CVDO477T	Design of Hydraulic Structures	8.2
CVRW478T	Rain Water Harvesting	8.3
CVBE479T	Bridge Engineering	8.4
CVUT480T	Urban Transportation Planning	8.5
CVGW481T	Ground Water Engineering	8.6
CVEO482T	Elements of Geoinformatics	8.7
CVEG483T	Environmental Geotechnology	8.8
CVPS484T	Prestressed Concrete	8.9
CVIT485T	Introduction to Finite Element Analysis	8.10
CVPR486P	Project	8.11

Program Outcomes - UG Programmes

- PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
- PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.
- PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
- PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- PO6. The engineer and society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
- PO7. Environment and sustainability: Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for, sustainable development.
- PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
- PO9. Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large; be able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11. Project management and finance: Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12. Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes - B.Tech Civil Engineering

- PSO1. Professional skills: The ability to analyse and design civil engineering systems and infrastructure as per relevant Indian standards and professional codes.
- PSO2. Problem solving and managerial skills: The ability to plan, manage, and execute infrastructure projects using modern tools and appropriate optimisation of resources.
- PSO3. Innovation and entrepreneurship: Acquire contemporary scientific knowledge and identify solutions in varied civil engineering domains that can enable innovation and entrepreneurial initiatives.
- PSO4. Research and development: Build an ecosystem of enquiry, experimentation, and development to address societal and industrial needs through civil engineering practice.

Mapping of POs, PSOs vs. Courses

Legend: H - High, M - Medium, L - Low. Mapping levels were assigned to align each course with its dominant contribution to programme outcomes and programme-specific outcomes under the revised NEP structure.

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4
1.1						H	M	H	M	M		M				
1.2	H	M		M			L					M				
1.3	H	H		M	M							M				
1.4	H	H	M	M	M						L	M	H			
1.5	H	M		M			L					M				
1.6	M			H	M				L	L		M				
1.7	M	M		H	M				L	L		M	M			L
1.8	M		M		M				L		L					
1.9		M	H		M				M	M		M			M	
2.1	H	M		M			L					M				
2.2	H	H		M	M							M				
2.3	M	H		M	H					L		M			L	
2.4						M	L	M	M	H		M				
2.5	M		H		M					L			M			
2.6	M			H	M				L	L		M				
2.7		M		M	H				L	L		M			L	
2.8						M	L	M	M	H		M				
2.9						H	M	H	M	M		M				
2.10								M	H	L		M				
3.1	H	H	M	M	M						L	M	H			
3.2	H	H		M	M							M				
3.3	H	H	M	M	M						L	M	H			
3.4	H	H	M	M	M	L	H				L	M	M		H	M
3.5						H	M	H	M	M		M				
3.6	M		H		M					L			M			
3.7	M	M		H	M				L	L		M	M			L
3.8	M	M		H	M				L	L		M	M			L
3.9		M	H	H	M	M	M	M	H	H	H	H	M	H	M	H
4.1	H	H	M	M	M	L	M				M	M	H	M		
4.2	H	H	M	M	M	L	M				M	M	H	M		

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4
4.3	H	H	M	M	M	L	H				L	M	M		H	M
4.4	H	H	M	M	M	L	H				L	M	M		H	M
4.5	H	H	H	M	M		M				M	M	H	M		
4.6		M	M		L	M	M	M	M	M	H	M		H	L	
4.7	M	M		H	M				L	L		M	M			L
4.8	M	M		H	M				L	L		M	M			L
4.9	M	M		H	M				L	L		M	M			L
4.10	M	M		H	M				L	L		M	M			L
4.11	M	M		H	M				L	L		M	M			L
4.12			M	L		H	H	M	L	M	M	M		M	M	L
4.13						H		H		M		L				
5.1	H	H	H	M	M		M				M	M	H	M		
5.2	H	H	M	M	M	L	H				L	M	M		H	M
5.3		M	M		L	M	M	M	M	M	H	M		H	L	
5.4	H	H	M	M	M	L	H				L	M	M		H	M
5.5	H	H	H	M	M		M				M	M	H	M		
5.6	H	H	M	M	M	L	M				M	M	H	M		
5.7	H	H	H	M	M		M				M	M	H	M		
5.8	H	H	M	M	M						L	M	H			
5.9	H	H	M	M	M						L	M	H			
5.10	M	M		H	M				L	L		M	M			L
5.11	M	M		H	M				L	L		M	M			L
5.12						M		H		M	M	M		M		
5.13			L			H	M	M	M	M	L	M		L		M
5.14		M	H	H	M	M	M	M	H	H	H	H	M	H	M	H
6.1	H	H	H	M	M		M				M	M	H	M		
6.2	H	H	M	M	M	L	M				M	M	H	M		
6.3	H	H	M	M	M	L	H				L	M	M		H	M
6.4	H	H	H	M	M		M				M	M	H	M		
6.5	H	H	M	M	M	L	H				L	M	M		H	M
6.6	H	H	H	M	M		M				M	M	H	M		
6.7	H	H	M	M	M	L	H				L	M	M		H	M
6.8	H	H	M	M	M	L	H				L	M	M		H	M

Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4
6.9	M	M		H	M				L	L		M	M			L
6.10	M	M	M	M	H					L		M	M		M	
6.11		M	H	H	M	M	M	M	H	H	H	H	M	H	M	H
6.12			L			H	M	M	M	M	L	M		L		M
7.1	M	M	M	M	H					L		M	M		M	
7.2	H	H	H	M	M		M				M	M	H	M		
7.3	H	H	H	M	M		M				M	M	H	M		
7.4	H	H	M	M	M						L	M	H			
7.5	H	H	H	M	M		M				M	M	H	M		
7.6		M	H	H	M	M	M	M	H	H	H	H	M	H	M	H
7.7		M	H	H	M	M	M	M	H	H	H	H	M	H	M	H
7.8			M	L		H	H	M	L	M	M	M		M	M	L
8.1	H	H	H	M	M		M				M	M	H	M		
8.2	H	H	H	M	M		M				M	M	H	M		
8.3	H	H	M	M	M	L	H				L	M	M		H	M
8.4	H	H	H	M	M		M				M	M	H	M		
8.5	H	H	M	M	M	L	M				M	M	H	M		
8.6	H	H	M	M	M	L	H				L	M	M		H	M
8.7	M	M	M	M	H					L		M	M		M	
8.8	H	H	M	M	M	L	H				L	M	M		H	M
8.9	H	H	H	M	M		M				M	M	H	M		
8.10	M	M	M	M	H					L		M	M		M	
8.11		M	H	H	M	M	M	M	H	H	H	H	M	H	M	H