

As Per NEP 2020

University of Mumbai



Syllabus for Basket of OE	
Board of Studies in Civil Engineering	
UG Second Year Programme	
Semester	III/IV/V
Title of Course	Credits
Civil Engineering and Infrastructure Essentials	2
From the Academic Year	2024-25

Sr. No.	Heading	Particulars
1	Description the course: Including but Not limited to :	This course introduces students from diverse backgrounds to the fundamentals of civil engineering, exploring its vital role in shaping society, protecting the environment, and enhancing daily life. Civil engineering addresses essential societal needs, such as clean water, transportation, and shelter, by designing and constructing safe, efficient, and sustainable infrastructure. Through topics like structural design, environmental systems, transportation networks, and urban planning, students will learn how civil engineering contributes to improving quality of life, promoting public safety, and driving economic development. The course also examines the challenges and responsibilities of civil engineers in balancing technological advancement with environmental stewardship and social equity.
2	Vertical :	Open Elective
3	Type :	Theory
4	Credit:	2 credits
5	Hours Allotted :	30 Hours in semester
6	Marks Allotted:	50 Marks
7	Course Objectives: 1. Understand the role of civil engineering in modern society 2. Recognize the social, environmental, and economic implications of civil engineering projects 3. Apply basic civil engineering concepts to real-world problems 4. Develop critical thinking and problem-solving skills.	
8	Course Outcomes: After completion of this course the learner will be able to 1. Explain developments in civil engineering 2. Describe urban planning and the role of various agencies. 3. Explain documents and terms related to building construction. 4. Analyze the use of construction material. 5. Appraise water and waste management 6. Describe the transportation systems and their components	

9	Modules: - Per Credit One module can be created
	Module 1: Introduction to Civil Engineering Hours: 03

	1. Basics of Engineering and Importance of Civil Engineering. What is Civil Engineering/ Infrastructure? Introduction to different disciplines of Civil Engineering 2. The role of civil engineers in urban and infrastructure development. Discussion on current trends and prospects in civil engineering. 3. Five-year plan outlays for construction; current budgets for infrastructure works
	Module 2: Infrastructure Development Hours: 06
	1. Basic concepts of urban planning, Types of urban infrastructure (transportation, water, energy) Various types of infrastructure projects, Public-Private Partnerships (PPP), Build-Operate-Transfer (BOT), Build-Own-Operate etc. 2. Role of CIDCO, MMRDA, MHADA etc. 3. Sustainable development, green building, and smart city
	Module 3: Building Basic and By-Laws Hours: 06
	1. Building by-laws, zoning in town planning, regulations and permissions for commencement and completion of a building, 7/12, 8A and property card Extracts, RERA 2. Understanding Plinth Area, Carpet area, Built-up area, Super Built-up area, and Floor Space Index; Saleable area, building components (foundations, beams, columns, walls, roofs, etc.) Function and importance of each element 3. Importance of construction safety, accessibility and maintenance.
	Module 4: Building Construction Materials Hours: 03
	1. Common materials used in construction: cement, concrete, steel, bricks, wood etc. 2. Modern construction materials
	Module 5: Water and Waste Management Hours: 06
	1. Water demand, Types of water supply systems, treatment and water distribution systems 2. Study of Sanitation, basics of plumbing and its components 3. Rainwater harvesting and sustainability

	Module 6: Transportation Systems Hours: 06	
	1. Importance of transportation infrastructure in economic development, Traffic management and safety 2. Study of Public Transportation: Highways: Types of highways, Types railways: Bullet train, Metro etc. 3. Bridges: Types of Bridges (Introduction) Bandra Worli sea link, Atal Setu, Chenab Bridge etc. Salient Features of famous Bridge structures.	
10	Text Books: 1. Building Construction, S.C. Rangwala, Charotar Publishing House, 2017 (edition), ISBN-10: 9380576334 and ISBN-13: 978-9380576334 2. Water Supply Engineering, S.K. Garg, Khanna Publishers, 24th edition, 2019, ISBN-10: 9380719599, ISBN-13: 978-9380719598 3. Transportation Engineering: Theory, Practice and Reality, S.L. Dhingra, CRC Press, 2017, ISBN-10: 113803571X, ISBN-13: 978-1138035716 4. Building Materials, S.K. Duggal, New Age International Publishers 5. Learners are expected to refer reports published at national and International level 6. Refer updated information available on authentic web sites 7. Articles from any reputed journal paper	
11	Reference Books: 1. Sustainable Development in Civil Engineering, M.K. Tiwari, I.K. International Publishing House Pvt. Ltd., 2017, ISBN-10: 9385916373, ISBN-13: 978-9385916377 2. Planning: Theory and Practice, R.K. Khanna, S. Chand Publishing 3. Refer updated information available on authentic web sites 4. https://archive.nptel.ac.in/courses/105/107/105107210/ 5. NPTEL :: Civil Engineering - Water and Waste Water Engineering 6. https://nptel.ac.in/courses/110101153 7. https://nptel.ac.in/courses/105104183	

12	Internal Continuous Assessment: 40%	Semester End Examination: 60%
13	Continuous Evaluation through: IAT-1 : 15 marks IAT-2: 15 marks Average of IAT-1 & IAT-2 = 15 marks. Projects, Presentation and assignments, (5 marks)etc.	Semester End Examination (30 marks) - Duration 1 hours.
14	Format of Question Paper: End-semester examination • Question Paper will comprise three questions each with 10 marks. • All modules must be covered. All three questions need to be answered.	

Sd/-
Dr. Rajendra Magar
BoS Chairman
Civil Engineering

Sd/-
Dr. Deven Shan
Offg. Associate Dean
Faculty of Science &
Technology,
University of Mumbai.

Sd/-
Dr. Shivram Garge
Offg. Dean
Faculty of Science &
Technology,
University of Mumbai.