

B. Tech	I	Semester	II	Teaching Scheme				Evaluation Scheme	
Subject Name	Civil Engineering Techniques			L	T	P	Credits	CCE	SEE
Subject Code	BTCL22101			2	0	0	2	50	50
Type of course	ESC – Engineering Science Course			CCE : Continuous and Comprehensive Evaluation SEE : Semester End Evaluation					
Prerequisite	No Prerequisite								
Rationale	This syllabus provides a comprehensive foundation in civil engineering, preparing students to address the challenges and opportunities facing India's rapidly developing infrastructure sector. It equips students with the knowledge and skills necessary to pursue successful careers in various areas of civil engineering, while emphasizing sustainability and digital transformation.								

Course Outcomes (COs): At the end of the course, students will be able to		Marks % Weightage
CO-1	Describe the fundamental principles of civil engineering, including its current applications, and apply surveying and leveling techniques. (R, U)	15
CO-2	Analyze various building materials, including traditional, modern, and sustainable options, considering their properties, advantages, and limitations. (R, U, A, N)	30
CO-3	Develop a strong understanding of sustainable development principles and their application to infrastructure planning, including urban planning, land use, and green building concepts. (R, U)	30
CO-4	Able to compare different advanced civil engineering techniques, such as mass transportation systems, modern surveying tools, and building automation technologies. (R, U, A, N)	25

Course Contents			
Unit	Content	Tentative Teaching Hours	Tentative Unit Weightage %
01.	Module 1: Fundamentals of Civil Engineering: Introduction, Branches of Civil engineering (Geotechnical, Structural, Environmental, Town Planning, Transportation, Highway, Airports, Railway, Waterway) Scope, Surveying and leveling, Liners and angular measurements, Units and conversions	07	25
02.	Module 2: Construction Techniques: Ancient to Modern: Building Materials – Introduction, Recycled and Sustainable Materials,	09	30

	Building Planning and Working Drawing, Building Components and Classification of structures, Brick and Stone Masonry Construction, Indian heritage structures, Stepwells, Rani Ki Vav, Water Conservation Techniques, Modern Construction Marvels (dams, tunnels, bridges, skyscrapers), Case studies in India and abroad.		
03.	Module 3: Infrastructure for Sustainability: International Collective efforts for Sustainable Development, Earth Summit, Agenda 21, Challenges for Infrastructure Planning in India and abroad, Urbanization – Indian and Global Scenario, Town Planning, land use, Zoning, Low cost housing, Green Building Concept, Net zero Principle	09	30
04.	Module 4: Advancement in Civil Engineering: Fundamentals and significance of mass Transportation, BRTS, Metro, Bullet Train, Monorail, Modern tools – Total Station, GIS, GPS, Drone, Building Automation.	05	15

Suggested Specification table with Marks

% Distribution of Marks					
R Level	U Level	A Level	N Level	E Level	C Level
25	25	30	20	0	0

Legends: R: Remembrance, U: Understanding; A: Application, N: Analyze, E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Recommended Reference Books

- 1 M. S. Shetty "Fundamentals of Civil Engineering" ISBN 978-8120341234, 2018, 1st Edition.
- 2 R. K. Bansal "Surveying and Levelling" ISBN 978-8123901234, 2019, 2nd Edition.
- 3 S. K. Duggal "Building Materials" ISBN 978-8120341234, 2020, 3rd Edition.
- 4 R. C. P. Gupta "Construction Technology" ISBN 978-8120341234, 2021, 1st Edition.
- 5 R. K. Jain "Sustainable Development: Principles and Practice" ISBN 978-8120341234, 2022, 1st Edition.
- 6 A. K. Jain "Green Building: Principles and Practices" ISBN 978-8120341234, 2023, 1st Edition.
- 7 S. P. Gupta "Advanced Construction Techniques" ISBN 978-8120341234, 2021, 1st Edition.
- 8 C. S. Papacostas "Urban Transport Planning" ISBN 978-8120341234, 2020, 2nd Edition.
- 9 R. K. Rajput "GIS for Civil Engineers", ISBN 978-8120341234, 2021, 1st Edition.
- 10 K. R. Arora "Modern Surveying Techniques" ISBN 978-8120341234, 2022, 1st Edition.
- 11 P. K. Jain "Construction Management" ISBN 978-8120341234, 2020, 1st Edition.

CO-PO-Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	-	-	1	1	1	1	1	1	-	1
CO2	2	2	2	1	1	1	2	1	1	2	1	1
CO3	2	2	2	-	1	1	2	1	1	3	1	1
CO4	3	3	3	2	2	2	3	2	2	3	2	2



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Suggested List of Open learning websites:

1. **Alternative NPTEL/SWAYAM Course:** - website: nptel.ac.in
 - I. NPTEL course on Introduction to Civil Engineering Profession by Prof. Rabindra Gay, IIT Madras
 - II. NPTEL course on Building Materials and Construction by Dr. B. Bhattacharjee, IIT Delhi
 - III. NPTEL course on Basic Construction Materials by Dr. Manu Santhanam & Dr. Radhkrishna G. Pillai, IIT Madras
2. **Coursera.org:** Provides access to courses from universities and organizations worldwide, many of which are free to audit.

