B. Tech. Civil Engineering				
Course code: Course Title	**Course Structure. Credit=4**			**Pre-Requisite**
CE 344: Building Materials, Masonry, Prestressing, and Construction Management	**L**	**T**	**P**	**CE203: Design of Structures-I**
	3	**0**	**2**	

Course Objective: Fostering students' competence in the use of different building materials, including masonry, prestressed concrete, and management of construction practices.

S. No	Course Outcomes (CO)
CO1	Introduction to the common building materials for civil infrastructure.
CO2	Proficiency for the design of special concrete structures**.**
CO3	Proficiency for the design of prestressed concrete structures.
CO4	Proficiency for the design of masonry and other materials of construction.
CO5	Students are able to implement knowledge of construction practices, planning and management in field works.

S. No	Contents	Contact hours
UNIT 1	**Building Materials**: Stone, Lime, Glass, Plastics, Steel, FRP, Ceramics, Aluminium, Fly Ash, Basic Admixtures, Timber, Bricks and Aggregates: Classification, properties and selection criteria; Cement: Types, Composition, Properties, Uses, Specifications and various Tests; Lime & Cement Mortars and Concrete: Properties and various Tests; Design of Concrete Mixes: Proportioning of aggregates and methods of mix design.	8
UNIT 2	**Design of Special Concrete Structures:** Design of Staircases; Counterfort-type retaining walls. Water tanks: Design requirements for Rectangular and circular tanks resting on the ground. Principles of earthquake-resistant design of structures.	6
UNIT 3	**Prestressed concrete**: Principles of pre-stressed concrete design including materials and methods; Methods and systems of prestressing, anchorages, Analysis and design of sections for flexure based on working stress, loss of prestress.	10
UNIT 4	**Masonry and other materials**: Specific use of materials like Ferro cement, fibre reinforced concrete, and timber construction. Masonry principles and construction detailing, Types of plastering, pointing, flooring, roofing, and common repairs, Functional planning of buildings and Building code provisions, Design of Masonry Structure as per I.S. Codes.	8

UNIT 5	**Construction Practices, Planning and Management**: Construction - Planning, Equipment, Site investigation and Management including Estimation with latest project management tools and network analysis for different Types of works; Analysis of Rates of various types of works; Tendering Process and Contract Management, Quality Control, Productivity, Operation Cost; Land acquisition; Labour safety and welfare. Construction activity schedules and organization, Quality assurance principles. Basic principles of network analysis (CPM and PERT), Economic analysis and methods, Project profitability and financial planning.	10
	TOTAL	**42**

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REFERENCES

S. No.	Name of Books/Authors/Publishers	Year of Publication / Reprint
1	Prestressed Concrete. N. Krishna Raju, McGraw-Hill Co.	2018
2	Prestressed Concrete Structures, Dayaratnam Pasala, Oxford and I B H Publishing Co	2015
3	Design Of Masonry Structures, A.W. Hendry, B.P. Sinha, and S.R. Davies. Routledge- Informa UK Limited.	2004
4	Review of Design Codes for Masonry Buildings, Document No. :: IITK-GSDMA-EQ10-V1.0, Dr. Durgesh C Rai, IIT Kanpur	2010
5	Punmia B. C., and Khandelwal K. K., "PERT and CPM", Laxmi Publications, New Delhi. (ISBN 0-07-23998904-1)	1999
6	R. L. Peurify, Construction Planning: Equipment and Methods, Tata McGraw-Hill, Inc. (ISBN 0-07-0476158-7	2000
7	Satyanarayanan & Saxena, Construction Planning and Equipment, Standard Publishers Distributors, New Delhi. (ISBN 0-01-257859-8)	1998
8	Advanced Reinforced Concrete Design, Varghese, P. C., Phi Learning.	2016
9	Design of Reinforced Concrete Structures, N. Subramanian, Oxford and IBH Publishing Co.	2013