

5th Semester	RCI5D003	Masonry Structures	L-T-P 3-0-0	3 Credits
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Module-I (8 Classes)

Introduction, Masonry units, materials and types: History of masonry, Characteristics of Brick, stone, clay block, concrete block, stabilized mud block masonry units- Strength, modulus of elasticity and water absorption.

Module-II (8 Classes)

Strength of Masonry in Compression: Behaviour of Masonry under compression, strength and elastic properties, influence of masonry unit and mortar characteristics, effect of masonry unit height on compressive strength, influence of masonry bonding patterns on strength, prediction of strength of masonry in Indian context, failure theories of masonry under compression.

Module-III (8 Classes)

Flexural and shear bond, flexural strength and shear strength: Bond between masonry unit and mortar, tests for determining flexural and shear bond strengths, factors affecting bond strength, effect of bond strength on compressive strength.

Module-IV (8 Classes)

Design of load bearing masonry buildings: compressive stress, stress reduction and shape reduction factors, increase in permissible stresses for eccentric vertical and lateral loads, permissible tensile and shear stresses, Effective height of walls and columns, opening in walls, effective length, effective thickness, slenderness ratio, eccentricity, load dispersion, arching action, lintels; Wall carrying axial load, eccentric load with different eccentricity ratios, wall with openings, freestanding wall; Design of load bearing masonry for buildings up to 3 to 8 storeys using BIS codal provisions.

Module-V (8 Classes)

Earthquake resistant masonry buildings: Behaviour of masonry during earthquakes, concepts and design procedure for earthquake resistant masonry, BIS codal provisions Masonry arches, domes and vaults: Components and classification of masonry arches, domes and vaults, historical buildings, construction procedure.

Books:

1. Dayaratnam P, "Brick and Reinforced Brick Structures"- Oxford & IBH
2. Sinha B.P & Davis S.R., "Design of Masonry structures"- E & FN Spon
3. Hendry A.W., "Structural masonry"- Macmillan Educaon Ltd., 2nd edion.
4. Curtin, "Design of Reinforced and Prestressed Masonry"- Thomas Telford.
5. Sven Sahlin, "Structural Masonry"-Prence Hall.

Digital Learning Resources:

Course Name	DESIGN OF MASONRY STRUCTURES
Course Link	https://nptel.ac.in/courses/105/106/105106197
Course Instructor	PROF. ARUN MENON Department of Civil Engineering IIT Madras