

AMID-15 FUNDAMENTALS OF STRUCTURES

Course Overview:

The course provides an in-depth understanding the concepts associated with framed structures.

Objectives of the course:

To provide knowledge of the different forces, force systems and structural behavior of different members due to applied forces.

Expected Skills / Knowledge Transferred:

Basic principles of mechanics and behavior of elements and ability to analyze the standard members in structures.

Course Contents: Unit I:

Introduction to built elements – study of built elements in the interiors with respect to materials used. Basic construction methods and general specifications. General types and classification of different types of buildings: overview of different functional, structural and architectural elements.

Unit – II:

Introduction to basic structural systems, elements of structure, their functions and behavior, beams, slabs, columns, walls, foundations, bearing wall systems, trusses, rigid frames, linear and curved elements, : simply supported, cantilever and overhanging beams for various loads, : effect of simple geometric forms in the overall structural behavior.

Unit – III:

Primary and secondary forces acting on the structures – gravitational force, live load, wind, temperature variation, distribution of loads through the elements of the structural system.

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Unit – V:

Characteristic requirements of structural design – stress and strains, strength, stiffness and stability. Discussion on factors affecting them and the ways of satisfying these requirements. Study of behavior of structures through

models and testing them for given loads.

Unit – VI:

Structural properties of basic materials like masonry, timber, concrete and steel etc. Light weight space structure, small and large scale surface structure, integrated display system and structural elements.

Unit – VII:

Structural systems and their layout for a small building. Structural systems for elements of interior spaces – false ceilings etc. Structural system for urban interior spaces – malls, fair grounds, exhibition spaces, etc.

Reference Books:

1. Rowland J. Mainstone : Development of Structural Form
Rangwala : Engineering Materials
2. S.P.Bindra, S.P.Arora, Building Construction
3. B.C. Punmia : Strength of Materials vol - I