

# AMEV-16 BASIC STRUCTURAL DESIGN

## OBJECTIVES:

This course aims at providing students with a solid background on the principles of structural engineering design. Students will be exposed to the theories and concepts of both concrete and steel design and analysis both at the element and system levels.

## UNIT I INTRODUCTION AND PLANNING

Introduction - Planning and Design Process - Design Philosophies-Structural Safety, Allowable Stress Design, Limit State Design - Types of Loading - Dead , Live, Wind and Earthquake loads - Fabrication Drawing of Simple Riveted, Bolted and Welded Connections.

## UNIT II LIMIT STATE DESIGN FOR FLEXURE

Analysis and design of singly and doubly reinforced rectangular and flanged beams - Analysis and design of one way, two way and continuous slabs subjected to uniformly distributed load for various boundary conditions.

## UNIT III LIQUID STORAGE STRUCTURES

RC Water Tanks- Circular and Rectangular - Design and Drawing -Hemispherical Bottomed Steel Water Tank - Design and Drawing.

## UNIT IV RETAINING WALLS

Design and Detailing of RC Cantilever and Counterfort Retaining Walls - Horizontal Backfill with Surcharge - Design of Shear Key.

## UNIT V INDUSTRIAL STRUCTURES

Steel Roof Trusses - Design and Drawing of Roofing Elements - Purlins - Design and Drawing of Self supported Chimney.

## OUTCOMES:

The students completing the course will have  
an understanding of the structural design fundamentals and limit state design for flexure  
ability to design and detail liquid storage structures, retaining walls and industrial structures

## TEXT BOOKS:

- Krishnaraju N, "Structural Design and Drawing", Universities Press, 200-.
- Punmia B.C, Ashok Kumar Jain and Arun Kumar Jain, "Comprehensive Design of Steel Structures", Laxmi Publications Pvt. Ltd., 2003.
- Punmia.B.C., Ashok Kumar Jain, Arun Kumar Jain, "Limit State Design of Reinforced Concrete", Laxmi Publication Pvt. Ltd., New Delhi, 2007.