

Structure for Non Structural Engineers

Training program

Introduction

Construction is the largest industry in the world and anything constructed needs to be designed first. Structural Engineering deals with the analysis and design aspects, the basic purpose of which is to ensure a safe, functional and economical structure. While designing, the designer constantly interacts with specialists like architects, operational managers, etc. Once the design is finalized, the implementation takes involvement of people to handle aspects like statutory approvals, planning, quality assurance, material procurement, etc. The entire exercise can be undertaken in a highly coordinated way if everyone involved understands the 'project language', which is a combination of designs and specifications. To understand the language fully, it is necessary to appreciate the principles of structural analysis and design and a course on this topic comes in handy here. Participants of this workshop will gain a basic knowledge of structural engineering that includes principles of analysis of structures and their application, behavior of materials under loading, selection of construction materials and design fundamentals for reinforced concrete and steel structures. The emphasis has been kept on the determination of nature and quantum of stress Developed under loads and the way structures offer resistance to it. Being the most widely used construction materials, reinforced concrete and steel has been covered in detail. The focus is made for understanding concepts and design solutions rather than rigorous mathematical derivations.

Objectives

- Fully understand the role of the structural engineer
- Comprehend the behavior of structural members under loading
- Understand the concept of stress functions like tension, Compression, shear and bending
- Use the basic concepts for analysis of statically determinate and indeterminate structures
- Analyze deformation of members under loading
- Select appropriate systems and materials
- Calculate member sizes
- Design footings, foundations, columns, beams, floor systems, shear walls and diaphragms
- Design simple structures in concrete, steel and wood
- Size equipment supports, components and anchorages

Who Should Attend?

Structural engineers, consultant engineering companies, and companies that deal with abnormal loading, blast loading or demolition.

Methodology

This interactive Training will be highly interactive, with opportunities to advance your opinions and ideas and will include;

- Lectures
- Workshop & Work Presentation
- Case Studies and Practical Exercise
- Videos and General Discussions

Certificate

BTS attendance certificate will be issued to all attendees completing minimum of 80% of the total course duration

Contents

Building Structural System

- Primary structural Elements
- Structural classification by load carrying action
- Structural classification by structural span type
- Steel Construction System
- Reinforced concrete Construction System

Strength of Materials

- Statics: force systems
- Equilibrium
- Shear diagrams
- Moment diagrams
- Determinate vs. indeterminate structures
- Deflection
- Moment of inertia
- Section modulus
- Radius of gyration
- Material behavior under stress
- Buckling

Loads and Design Philosophies

- Dead loads
- Live loads
- Seismic and wind loads
- Miscellaneous loads
- Working stress design
- Limit state design
- Code provisions
- Case study project presentation

Structural Steel Design

- Properties
- Materials
- AISC codes: LRFD and strength design
- Beams
- Columns
- Beam columns
- Trusses
- Bracing for lateral loads
- Connections
- Design examples

Reinforced Concrete Design

- Material properties and allowable stresses
- ACI code provisions
- Beams, columns, slabs
- Footing design
- Foundation and retaining walls
- Anchorage into concrete
- Composite construction
- Introduction to masonry structures
- Design examples