



Structural Design & Analysis using Bentley STAAD.Pro

Course Curriculum (Duration: 50 Hrs.)

Chapter 1: Before you start using Bentley STAAD.Pro

- a. Understanding Unit Conversion Tables
- b. Overview of Structural Design & Analysis
- c. Stresses and Strains
- d. Shear Force & Bending Moment Diagrams
- e. Introduction to Types of Structures
- f. Overview of Steel, Concrete and Foundation Design
- g. Introduction to Finite Element Analysis

Chapter 2: Introduction to STAAD.Pro

- a. About Bentley STAAD.Pro
- b. Starting STAAD.Pro
- c. Graphical User Interface
- d. Starting a New Project
- e. Working with User Interface:
 - Menu Bars
 - Tool Bars
 - Tabs
 - Snap Node / Beam Window
 - Data Area
 - Main Window
- f. Opening and Existing Project
- g. Saving a Project
- h. Configuring Units
- i. Keyboard Shortcuts
- j. Importing Model in STAAD.Pro
- k. Coordinate Systemes

Chapter 3: Structural Modeling

- a. Adding Beams using Tools
- b. Creating Beams (Colinear, Along Axes)
- c. Creating Plates
- d. Creating Surfaces
- e. Creating Solid Elements
- f. Creating Structure
- g. Stretching and Intersecting Members
- h. Merging Members and Nodes
- i. Renumbering Nodes, Members and Elements
- j. Splitting and Breaking Beams
- k. Cutting Sections

Chapter 4: Material Constants and Section Properties

- a. Material Constants
- b. Creating and Editing Material Properties
- c. Assigning Materials to the Structure
- d. Orthotropic Materials
- e. Section Properties

- Prismatic Sections
- Tapered Sections
- Steel Sections
- Steel Joist and Joist Girders
- Plate/Surface Thickness

Chapter 5: Member Specifications and Supports

- a. Node Specification
- b. Member Specifications
 - Release
 - Offset
 - Property Reduction factors
 - Cable
 - Truss
 - Compression
 - Tension
 - Inactive
- c. Plate Specifications
 - Release
 - Ignore Inplane Rotation
 - Plane Stress
- d. Supports:
 - Fixed
 - Pinned
 - Fixed But
 - Enforced
 - Enforced But
 - Multilinear Spring
 - Foundation
 - Inclined
 - Tension/Compression Only Springs

Chapter 6: Loads

- a. Types of Loads: Selfweight, Nodal, Member, Area, Floor, Plate, Surface and Solid,
- b. Load Generation
- c. Load Combinations

Chapter 7: Performing Analysis

- a. Pre Analysis
 - Problem Statistics
 - Joint Coordinates
 - Member Information
 - Material Properties
 - Support Information
 - Element & Solid Information
- b. Performing Analysis

Chapter 8: Post Processing & Report Creation

- a. Post Analysis Print
 - Load Lists
 - Joint Displacement
 - Member Forces
 - Support Reactions
 - CG
 - Mode Shapes
 - Section Displacement

- Analysis Results
 - Member Stresses
 - Element Forces/Stresses
- b. Viewing Results
 - c. Output File
 - d. Post Processing Mode

Chapter 9: Analysis Case Studies / Workshops

- a. RCC Design & Analysis (Beams and Columns)
- b. Steel Design & Analysis (Frames and Trusses)
- c. Miscellaneous Analysis
- d. Practice examples for Students

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