



**IFS ACADEMY**

Training For The Future!!



**IFS Academy Certified Career Program in Structural Design &  
Analysis using Bentley STAAD.Pro  
Instructor-Led Online Training  
Course Curriculum (Duration: 90 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: Self Weight, 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: RCC Design**

- a. General overview of Concrete Design As per IS 456:2000
- b. RCC Design Parameters in STAAD.Pro
- c. Design of Beams
- d. Design for Flexure
- e. Design for Shear
- f. Design of Columns
- g. Concrete Design Command
- h. Concrete Design Parameter Specification
- i. Concrete Take off Command
- j. Analysis and Design of G+3 RCC Framed Building using STAAD.Pro

### **Chapter 10: Steel Design**

- a. General Overview of Steel Design as per IS 800
- b. Working / Allowable Stresses Design
- c. WSD Parameter Specifications
- d. Limit State Design
- e. LSD Parameter Specifications
- f. Member Selection Specifications
- g. Tabulated Results of Steel Design
- h. Analysis and Design of Structural Steel Framed Building using STAAD.Pro
- i. Analysis and Design of Structural Steel Truss Building using STAAD.Pro
- j. Analysis of Crane Girder using Moving Load Method

### **Chapter 11: Seismic Analysis**

- a. Introduction to Seismic Analysis
- b. Earthquake Loading in Structures / Buildings
- c. Earthquake Load Generation using Static Method as per IS 1893
- d. Earthquake Load Generation using Response Spectrum Method as per IS 1893

### **Chapter 12: Wind Load Analysis**

- a. Introduction to Wind Loads
- b. Introduction to Wind Loads as per IS 875 Part III
- c. Application of Wind Loading in STAAD.Pro

### **Chapter 13: Introduction to Finite Element Analysis**

- a. Use of Finite Element Analysis in Structural Analysis
- b. Plate Analysis

### **Chapter 14: Analysis of Water Tank**

- a. Introduction to Various Types of Loadings in Water Tanks
- b. Analysis of Underground Circular and Rectangular Water Tank

- c. Analysis of Circular and Rectangular Water Tank Resting on Ground
- d. Analysis of Circular and Rectangular Overhead Water tank
- e. Analysis of Cantilever Retaining Wall
- f. Analysis of each of above type of structure using STAAD FEM and design using IS: 3370.



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