



SC080: Structural Steel Design

Training Description:

Steel is the most used construction material in the USA for industrial buildings, high-rise towers, bridges and other structures. It competes with reinforced concrete in the world because of its many favorable characteristics including high strength, high stiffness, ductility and toughness, speed of erection, competitive cost, etc. In the Middle East region, steel is mostly use in industrial plants, offshore structures and warehouses. The speed for construction and its use for building temporary structure make it competitive than concrete.

The design of steel structures that has been widely based on the Allowable Stress Design (ASD), AISC, BS and EC3 will be discussed. This intensive training course will be presented to enable the participants of design most elements of steel structure in addition to connections.

The petroleum industry's interest to modify the structure in the on-shore facilities to carry more load or add more machines so the integrity management of change must be considered important. The composite section design and FRP will be presented in this training course. The pushover analysis will be discussed to define the probability of failure for industrial structure.

The training course will highpoint:

- Case studies from different industry
- The codes and standard with technical practice in this field
- The new trend of integrity management system will be presented
- The design of most elements of steel structure
- The capability of review the engineering and pitfalls in construction

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Be familiar with the "Steel Structure" design
- ✓ Understand the loads applied on the steel structure in oil, gas and petrochemical plant
- ✓ Know the modern technique on the risk-based inspection for maintenance plan
- ✓ Be familiar with the pipe rack design
- ✓ Know the design of the steel structure on machines
- ✓ Identify the use of composite section in strength and repair

Training Designed for:

This course is intended for Civil Engineers, Design Structural Engineers, Construction Engineers, Supervision Engineers, Planners and Steel Fabricators.

Training Requirement:

"Hand's on practical sessions, equipment and software will be applied during the course if required and as per the client's request."

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

- ❖ PRE-TEST
- ❖ Introduction to Steel Structure
 - Advantages and Disadvantages of Steel as Structural Material
 - Steel Sections
 - Failure of Structures
 - Specification and Building Codes
 - Computational of Loads for LRFG and ASD
 - Methods of Obtaining an Acceptable Level of Safety
 - Review of Basics of Mechanical and Analysis Structure

DAY TWO:

- ❖ Analysis and Design of Tension Members
 - Nominal Strength of Tension Members and Net Area
 - Effect of Staggered Holes
 - Connecting Elements for Tension Members
 - Selection of Sections
 - Built-up Tension Members
 - Pin-connected Members

DAY THREE:

- ❖ Analysis and Design of Compression Members
 - Sections Used for Column
 - Euler Formula
 - Long, Short, and Intermediate Columns and Column Formulas
 - AISC Design Tables
 - Column Splice
 - Built-up Columns
 - Single Angle Compression Member
 - Base Plates for Concentrically Loaded Columns

DAY FOUR:

- ❖ Design of Beams and Connections
 - Introduction to Beams
 - Design of Beams and Deflection
 - Members Subjected to Bending and Axial Tension
 - Design of beam - *columns, braced or unbraced*
 - Tension Loads on Bolted Joints
 - Bolts Subjected to Shear and Tension
 - Introduction to Welds and Types
 - Design of Simple Fillet Welds

DAY FIVE:

- ❖ Composite Sections and Steel Buildings
 - Composite Constructions

- Moment Capacity of Composite Sections and Deflections
- Design of Concrete Encased Sections
- Axial Design of Composite Columns
- Cover Plated Beams and Flexural Strength
- Composite Floors and Concrete - *Pan floors*
- Types of Roof Construction
- Exterior Walls and Interior Partitions
- Fireproofing of Structural Steel

❖ **Course Conclusion**

❖ **POST-TEST and EVALUATION**

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

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|---------------|-------------------------------|
| 07:45 - 08:00 | Morning Coffee / Tea |
| 08:00 - 10:00 | First Session |
| 10:00 - 10:20 | Recess (Coffee/Tea/Snacks) |
| 10:20 - 12:20 | Second Session |
| 12:20 - 13:00 | Recess (Prayer Break & Lunch) |
| 13:00 - 14:00 | Last Session |

For training registrations or in-house enquiries, please contact:

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