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Advanced Structural Analysis & Design

COURSE OVERVIEW

This advanced course explores key principles and modern methods for analyzing and designing complex civil engineering structures. It extends beyond basic determinate analysis to cover indeterminate systems, structural dynamics, and stability under diverse loading conditions. The curriculum blends theory with application, emphasizing matrix methods, computer-aided analysis, and performance-based design to develop safe and resilient structures. Participants will be able to analyze and design complex structural systems using advanced analytical and computational tools, supporting specialized roles in structural engineering, consulting, research, and project delivery.

WHO SHOULD ATTEND?

This course is essential for structural engineers, bridge engineers, and civil engineering professionals specializing in the design, analysis, and review of complex structures such as high-rise buildings, long-span bridges, and special facilities, who are responsible for implementing advanced analytical methods and ensuring structural integrity under diverse loading conditions.

COURSE OUTCOMES

Delegates will gain the skills and knowledge to:

- Apply matrix-based methods, including the Direct Stiffness Method, to analyze complex indeterminate structures.
- Analyze structural stability and failure mechanisms, including elastic buckling of columns and frames.
- Evaluate the dynamic response of structures to seismic, wind, and other dynamic loads.
- Design and detail complex structural components and systems using reinforced concrete and structural steel.
- Utilize finite element software to model and analyze sophisticated structural systems.
- Integrate performance-based design principles and sustainability considerations into structural solutions.

KEY COURSE HIGHLIGHTS

At the end of the course, you will understand;

- Matrix analysis methods for solving complex indeterminate structures.
- Structural stability principles and elastic buckling behavior.
- Dynamic analysis techniques for seismic and wind loading.
- Advanced design methodologies for steel and concrete systems.
- Finite element applications in structural engineering.
- Performance-based design approaches for resilient structures.
- Integration of sustainability considerations in structural design.

All our courses are dual-certificate courses. At the end of the training, the delegates will receive two certificates.
1. A GTC end-of-course certificate
2. Continuing Professional Development (CPD) Certificate of completion with earned credits awarded