



Arabian Institute For Training

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# Construction & Civil Engineering Fundamentals for Non-Civil Engineers

## INTRODUCTION

- Civil Engineering deals with the design and construction of the artefacts of civil use. This training course is designed for non-civil engineers aspiring to work in construction and civil engineering industry. This Construction and Civil Engineering Fundamentals for Non-Civil Engineers training course will help non-civil engineers to develop a career in the professional side of the civil or construction industry by providing technical, organisational and problem solving skills in line with industry standards. They will be able to determine the economic feasibility of a project and make cost estimates for materials and equipment to be used in the entire project.

Participants will develop the following competencies:

- Familiarity with general terminology and standards used in Civil and Construction Engineering Industry
- Understanding of sustainability and environmental precautions as applied to Civil Engineering
- Ability to put in place measures to Quantify Progress and Condition of Projects
- Appreciation of Planning, Scheduling and Resources Control Techniques
- Identification and decisions on Cost Analysis for Civil Engineers

## PROGRAMME OBJECTIVES

- Familiarise with different types of Projects in Construction and Civil Engineering
- Understand the Principles of Construction and Project Management Techniques
- Understand Advanced Monitoring and Measurement Technologies
- Appreciate Sustainable and Environmental Consequences of Civil Engineering and Construction Projects

## WHO SHOULD ATTEND?

- Professionals and Leaders who wish to learn more about Construction and Civil Engineering Projects
  - Engineers and Technicians associated and / or wish to establish careers in Construction and Civil Engineering Organisations
  - Personnel moving into Construction and Civil Engineering roles including Leadership, Technical and Project Management Roles
  - Building Control Surveyors, Consulting Engineers, Geologists and Infrastructure Project Engineers
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## TRAINING METHODOLOGY

- This training course will be conducted along workshop principles with formal lectures, case studies and interactive worked examples. Relevant case studies will be provided to illustrate the application of each tool in an operations environment. Each learning point will be re-enforced with practical exercises. There will be ample opportunities for discussion and sharing experiences.

## PROGRAMME SUMMARY

- Technical knowledge is a key to effective control and peer respect within any civil engineering and construction organisation; when this is achieved personal satisfaction follows. This Construction & Civil Engineering Fundamentals for Non-Civil Engineers training course will give delegates the required level of technical knowledge and skill to achieve that personal satisfaction. Optimum project management, planning and resources control techniques, in addition to environmental issues, are vital to the success of construction and civil engineering organisations. On completion of this training course delegates will be able to critically analyse the methodologies employed within the organisation and instigate improvements where required.

## PROGRAM OUTLINE

### Construction and Civil Engineering Fundamentals

- Main elements in Construction and Civil Engineering Business
- Health, Safety and Welfare in Construction and the Built Environment
- Sustainable Construction Related Issues
- Planning Organization for Construction and Civil Engineers
- Control of Resources in Civil Engineering Projects
- Case Study

### Materials Science and Key Properties

- Materials in construction and the built environment
  - Identification of the most important materials
  - Materials key properties
  - Techniques used to prevent deterioration
  - Construction technology and design in Construction and Civil Engineering
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## Construction Projects and Surveying Strategies

- Requirements of construction related projects
- Implications of changes and variations in the design
- Infrastructure projects: new roads, railways, airports and water projects
- Layout of drawings, the choice of scale and proportion,
- Types of views used
- The use of correct line widths, conventional graphic symbols
- The appropriate use of annotation
- Surveying in construction and Civil Engineering
- Surveying tasks and techniques
- Case study

## Structural Mechanics and Analysis

- Structural Mechanics in Construction and Civil Engineering
- Forces created in the building framework and the structural elements
- Safely design within simple structural units
- Computer–aided drafting and design for construction
- How CAD is used to produce drawings
- Softwares to produce 2D drawings and 3D models
- Case study

## Calculations and Standards in Construction

- Statistical data analysis for beams and columns
  - Complex linear / angular / area and volume measurements
  - Trigonometrical identities, rates of change and decay, numerical integration
  - Data presentation and interpretation
  - Over view of codes used in construction
  - Case study
  - Course review and closure
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