

### Training Title

**ADVANCED TECHNIQUE IN STRUCTURAL ENGINEERING**

### Training Duration

5 days

### Training Date

Ref CE100	ADVANCED TECHNIQUE IN STRUCTURAL ENGINEERING	5	7 – 11 Oct '18	\$4,250	Dubai, UAE
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In any of the 5 star hotels. The exact venue will be informed once finalized.

### Training Fees

- 4,250 US\$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch

### Training Certificate

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

Language: English

### TRAINING OVERVIEW

#### COURSE DESCRIPTION

Concrete is used throughout the world for a wide range of applications. In order to improve the properties of concrete, recent advances in material science introduce new materials or admixtures to be added to or replace conventional concrete materials. Such materials could be used in new concrete construction and/or in repairing new or existing structures. These materials could cause more harm than benefit or at least be ineffective if not properly used.

This five-day course will introduce QA/QC approaches and cover test methods and technical specifications for concrete materials as well as troubleshooting for their most common problems.

This course is planned to answer technical questions frequently asked by the experienced engineer and executives. It includes information about the significance of applicable codes and standards, critical characteristics of a given structure, types and causes of common deficiencies of structures.

At the end of this course, participants will know the necessary information about the different advanced concrete materials, what tests should be performed and how to



interpret their results, what to look for in specifications and troubleshooting of material related problems.

#### **PROGRAM OUTLINE**

- Materials used in concrete and steel construction
- Relevant tests to verify the material specification
- Physical and mechanical properties of concrete and reinforcing steel
- Concrete mix design
- Practical considerations in developing QA/QC systems
- Advanced composite materials (components, advantages, disadvantages , types and applications)
- Field testing & testing equipment

#### **TRAINING OBJECTIVES:**

The goal of this course is to provide participants with an advanced understanding of the properties of traditional and emerging materials used in civil engineering construction, newly developed construction materials, and test methods for different conventional and advanced materials used in concrete and steel construction. The course covers modern field measurements such as concrete strength, concrete uniformity and others.

Upon the completion of this course, the participant will be able to select the appropriate material to achieve particular design goals and recognise the governing standards, performance criteria, and laboratory and field tests for characterizing such materials.

Quality control and quality assurance approach is handled through the course. Focus on the approach of workable preventive measures for the decay and deterioration of structures, and the use of innovative technology and new materials is also introduced.

#### **TRAINING METHODOLOGY**

The course is designed to maximise delegate benefit from the outset. The goals of each participant are discussed to ensure their needs are fulfilled as far as possible. Questions are encouraged throughout particularly at the daily wrap up sessions. This provides opportunities for participants to discuss specific issues and if possible find appropriate solutions. Case studies are employed to highlight particular points and appropriate video material used to illustrate particular conditions.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work& Practical Exercises
- 20% Videos& General Discussions



## WHO SHOULD ATTEND?

This course is designed for senior engineer, projects Engineer, design engineer and Supervisors with professional knowledge.

## Course Outlines

### DAY 1

- Basics of concrete as a composite material
- Main components of concrete
- Advances in construction industry
- Categories of construction materials
- Metals
- Ceramics
- Polymers
- Composites

### DAY 2

- Quality control and quality assurance
- Quality control plan
- Quality levels
- Internal and external quality control
- Methods of quality control
- Instruments required in job sites
- Testing equipment
- Properties of repair materials
- Application conditions
- Service conditions
- Material selection

### DAY 3

- Cement as a concrete binder
- Concrete aggregates
- Mixing water
- Admixtures
- Steel reinforcement
- Testing of construction materials
- Mix design approach
- Methods of mix design

### DAY 4

- Properties of fresh concrete



- Properties of hardened concrete
- Destructive and non-destructive testing of concrete
- Purpose of in-situ evaluation
- Preliminary investigation
- Visual inspection
- Rebound number (ASTM C 805)
- Penetration resistance (ASTM C 803)
- Pullout test (ASTM C 900)
- Break-off test (ASTM C 1150)
- Ultrasonic pulse velocity (ASTM C 597)
- Tests on concrete cores
- Rebar locator
- Corrosion detection

## DAY 5

- High-performance concrete
- Self-consolidating concrete
- Fibre-reinforced concrete
- Lightweight concrete
- Polymer modified concrete
- Sprayed concrete (shotcrete)
- Epoxy-coated steel reinforcement
- Galvanized steel reinforcement
- Emerging corrosion resistant steel reinforcement
- Fibre-plastic reinforcement (FRP)
- Hybrid reinforcement new technology
- Case studies

## NOTE:

**Case Studies, Last Day Review, Discussions & Pre & Post Assessments will be carried out.**