

## Civil Engineering & Operations



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### Course Objective

- Understand the various types of damage that can affect concrete and reinforced concrete structures and be familiar with their effects in the assessment and rehabilitation of the structures
- Know the method of damage assessment including the identification of service and exposure conditions of concrete structures
- List down the codes and standards used in the assessment and rehabilitation of concrete structures and identify the design precautions for carbonation and chloride ingress
- Learn how to conduct visual and exploratory investigation of damaged concrete structures and determine ways on how to locate and monitor delaminated concrete, voids, cracks, honeycombs, etc
- Explain the principles of rehabilitation including methods to prevent defects in concrete, rehabilitation methods against corrosion damage and determine the required properties of repair materials and systems in concrete structure
- Explain the surface repair of concrete structures, list material requirements, reinforcing steel cleaning, repair & protection and be familiar with the placement methods that are applied to the concrete structures
- Employ the proper procedure for strengthening and stabilization of concrete structures including the techniques/design considerations,

shear transfer strengthening between members, stress reduction techniques and crack stabilization

- Be familiar with risk-based maintenance strategy as well as the required repair time, required time to start of corrosion, time required to start of deterioration and cost analysis for different protection methods
- Identify and apply the strategies and methods of protection of concrete structures

## ➔ Target Audience

- Engineers
- Supervision engineers
- Construction engineers
- Material engineers
- Maintenance technicians

## ➔ Course Outline

### Day 1

- Types of finishing materials
- Properties and specifications of the modern finishing materials.

### Day 2

- Durability of the finishing materials
- Steps of application to the finishing materials.
- Common faults in application of finishing materials

### Day 3

- Types of retrofitting and repairing materials
- Specification and properties to retrofitting and repairing materials.
- The main function of the retrofitting and repairing materials

### Day 4

- Selecting the suitable material of repair.
- Various techniques of repair.
- Common faults of choosing the repairing techniques.

### Day 5

- Application for the repair material.
- Common faults in application of repairing materials
- Up-to-date materials used in repair e challenge of risk and uncertainty in modern business

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- 3) Training.
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**Price (USD)**

**Communicate with the training department  
to know the participation fees**

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