Engineering Training Center
Ain Shams University / Faculty of Engineering

Engineering Training Programs

Part 1

Engineering Training Cente
Ain Shams University / Faculty of Engineering

Chemical Engineering Programs

Chemical Engineering Programs

ADVANCED CORROSION TECHNOLOGY

COURSE OBJECTIVES:

This course will give participants a comprehensive understanding of corrosion principles, causes and forms.
The course aims also at enabling participants to relate specific types of corrosion to the environments that lead to their occurrence.

COURSE CONTENTS:

- Waterside Corrosion Technology :
- Corrosion by boiler water - Corrosion by cooling water - Sea water corrosion - Cooling towers corrosion
- Low Temperature Corrosion Problems :
- Atmospheric - Caustic and hydrogen- Overhead - Acid - Stress cracking - Prophetic deposits - Cryogenic (Very low temperature) - Material failure.
- High Temperature Corrosion Problems :
  Oxidation and sulfidation.
  High temperature Hydrogen damages.
  Carbonization and metal dusting.
  Corrosion resistant material.
  Erosion resistant materials.
  Materials limitations.
  Case studies.
- Corrosion Control Techniques :
  Metallic - cladding - Lining and metabolizing - Paint technology -
  Non-metallic: Ceramic and cement Catholic protection - Anoxic protection - Corrosion inhibitors.
- Corrosion Monitoring Techniques.
- Corrosion Economics.

Chemical Engineering Programs

ADVANCED CORROSION TECHNOLOGY

TARGET PARTICIPANTS:

Corrosion engineers senior engineer's supervisors and other staffs whose work requires a deep appreciation of corrosion problems and control.
Process operation, inspection and maintenance engineers as well as laboratory chemists will also find this course of value.

LOCATION:

DURATION: One week

DATE:

WATER TREATMENT TECHNOLOGY

COURSE OBJECTIVES:

This course aims at providing participants with thorough understanding of all methods and techniques of industrial and water treatment.

COURSE CONTENTS:

- Water composition and specifications :
- Water resources - Basic composition and properties - Dissolved oxygen - pH, hardness - Suspended solids and colloids - Metallic ions
- Organic matter - Living organisms - Chemical and biological oxygen demand.
- Low Temperature Corrosion problems : Atmospheric - Caustic and hydrogen Overhead - Acid - Stress cracking - Prophetic deposits - Cryogenic (Very low temperature) - Material failure.
- High Temperature Corrosion Problems :
  Oxidation and sulfidation.
  High temperature Hydrogen damage.
  Carbonization and metal dusting.
  Corrosion resistant material.
  Erosion resistant materials.
  Materials limitations.
  Case studies.
- Corrosion Control Techniques : Metallic - cladding - Lining and metabolizing - Paint technology - Non metallic: Ceramic and cement - catholic protection - Anoxic protection - Corrosion inhibitors.
- Corrosion Monitoring Techniques.
- Corrosion Economics.

TARGET PARTICIPANTS:

Corrosion engineers senior engineer's supervisors and other staffs whose works require a deep appreciation of corrosion problems and control.
Process operation, inspection and maintenance engineers as well as laboratory chemists will also find this course of value.

LOCATION:

DURATION: One week

DATE:

WATER TREATMENT TECHNOLOGY

COURSE OBJECTIVES:

This course aims at providing participants with thorough understanding of all methods and techniques of industrial and waste water treatment.

COURSE CONTENTS:

- Water composition and specifications :
- Water resources - Basic composition and properties - Dissolved oxygen - pH, hardness - Suspended solids and colloids - Metallic ions - Organic matter - Living organisms - Chemical and biological oxygen demand.
- Physical treatment processes : Sedimentation and flocculation - Flotation - Filtration - Mechanical duration - Centrifuge and sludge handling - Adsorption ion exchange - Membranes separation.
- Chemical treatment : Chemical direction - Oxidation / reduction - Neutralization, - Precipitin - Incineration - Sterilization.
- Biological treatment : Aerobic: Towers - Activated sludge - Lagoons Anaerobic - Bacteriological analysis - Potable water specification.
- Sampling , measurement and analysis : Analytical, and sampling, methods.
- Industrial water management : Supply steams - Cooling water system - Waste streams - Mass balance of water and contaminants.
- Waste disposal :
  Environment quality standards.
  Disposal of sludge and solids.

TARGET PARTICIPANTS:

Engineers, chemists and supervisors involved in water treatment systems design / operation and control in industrial and power plants.

LOCATION:

DURATION: One week

DATE:

Chemical Engineering Programs

CATHODIC PROTECTION ENGINEERING

COURSE OBJECTIVES:

To refresh the participants technical backgrounds on causes and types of corrosion in plant equipment, storage tanks and pipelines.
To provide them with the necessary fundamentals of Catholic protection systems function, design, construction, operation and maintenance.

COURSE CONTENTS:

- Corrosion Principles ; Review : Electrochemistry - Galvanic cells - Ferrous and non-ferrous alloys.
  Industrial environment.
  Causes of corrosion.
  Forms of corrosion.
  Catholic Protection: Principles and types.

- Impressed Current System : Configuration - Selection of anodes - Design of ground beds - Current density - Protection current density - Difference in potential between. Buried structure and soil - Copper/ copper sulfate half electrodes.
  Rectifiers, cables, ampere and volt adjustment.
  Protective coating and tapes.
  Deep well anodes.
  Monitoring, Interpretation and record keeping.
  Solar energy as a source of current.

- Sacrificial Anodes Systems : Applications - Types of anodes - Anodes selection and limitations - Anodes fixation - Periodic inspection.

- Economics: Modifications - Cost of anodes and damaged cables - Stray currents - Interfering structures - Maintenance and repair.

TARGET PARTICIPANTS:

Corrosion engineers and technicians involved in design, operation, monitoring and maintenance of all types of catholic protection systems in industrial plants, oil fields refineries, petrochemical plants, power stations and terminals.

LOCATION:

DURATION: One week

DATE: