

Course Name: **Heat Exchanger**

Code:

DATE:

Course Objective:

**By the end of this training participants will be able to :**

- Make Proper Selection of Heat Exchanger for given Application
- Perform Heat Exchanger sizing and rating
- Actively interact with Vendors
- Take part in final inspection and analysis of heat exchangers

Program Methodology:

This training course will be conducted along workshop principles with formal lectures and interactive worked examples included in several workshops. The emphasis in the course will be on the explanation of all technical points and providing answers to problems that are encountered in everyday industrial practice related to installation, operation and maintenance of various types of heat exchangers. Each learning point will be reinforced with practical examples. There will be ample opportunities for active discussion and sharing professional experiences and exchange that will help solidify the gained knowledge. All course materials will be provided.

Who Should attend?

- Engineers in disciplines Process, Mechanical and Chemical,
- Project Engineers
- Design Specialist in Heat Exchanger Technology

**Kingdom of Saudi Arabia**

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- Technical professionals in charge of Maintenance and Repairs

## Course Outline:

### Day One: Designs and Applications

- Overview of industrial Heat Exchangers
- Basics of Heat Transfer and Fluid Flow
- TEMA Nomenclature and Configurations: Shell and Tube Designs (STHE)
- Construction Elements of STHE: Tube Bundle, Tube Sheet, Baffles, Nozzles
- Selection of Geometry Configuration based on Complexity of Fluids
- Materials of Construction and Fabrication Technologies

### Day Two: Operation and Efficiency of STHE

- Thermal Sizing and Rating of STHE: Specifications per API 660
- Estimate of Fluid Velocity and Pressure Drop: Pumping Power
- Efficiency in Operation
- Performance Monitoring and Testing: Parameter Validation
- Cost Effective Maintenance and Repair Techniques
- Control in Operation: Fluid Induced Tube Vibration

### Day Three: Advanced Heat Exchangers: Application and Advantages

- High Pressure Breach Lock Closure Type
- Texas Tower and Heli Tower
- Helixchanger and Helifin
- Tube Insert Technologies
- Twisted Tube Designs

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- Internally Finned Tubes Design

## Day Four: Technical Characteristics of Other Types of Heat Exchangers

- Efficiency of Reboilers (Thermosiphon, Kettle, etc.)
- Problems in Operation of Surface Condensers (Shell-side and Tube-side)
- Plate Heat Exchangers (PHE) and Welded Plate Compablock Design
- Air-cooled Heat Exchangers: Heat Transfer Control
- Cooling Towers

## Day Five: Operation and Maintenance of Heat Exchangers

- Installation, Commissioning and Startup of Heat Exchangers
- Problems in Operation and Troubleshooting Techniques
- Fouling, Corrosion and Erosion: Mitigation Methods
- Inspection and Fitness for Service Analysis (FFS API 579)
- Cost Effective Maintenance: Cleaning and Leak Detection
- Repair Techniques: Tube Plugging and Retubing

**Course Duration: ( 5 ) Day**

**Venue:**

**Time:**

**Numbers of hours: Hours**

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