



Mechanical Engineering

Heat Exchanger Inspection, Testing & Cleaning Method Techniques

Course Introduction

A heat exchanger is a vital component used to transfer heat between two fluids—either liquids or gases—for various industrial applications. The key purposes of heat exchangers include:

- Heating a cooler fluid using a hotter fluid
- Cooling down a hot fluid using a cooler fluid
- Boiling a liquid with a hotter fluid
- Condensing a gaseous fluid with a cooler fluid
- Simultaneous boiling of a liquid while condensing a hotter gaseous fluid

This course provides in-depth training on heat exchanger operation, maintenance, troubleshooting, and cleaning techniques to ensure optimal performance and longevity.

Target Audience

- **Mechanical Engineers**
- Boiler Engineers
- Power Engineers
- Rotating Equipment Engineers
- Pipeline Engineers
- Marine Engineers
- Automotive Engineers
- High-Pressure Engineers
- Turbine Engineers
- Naval Architects
- Validation Engineers
- Senior Mechanical Engineers

Learning Objectives

- Understand heat exchanger classifications and their working principles
- Learn various heat transfer methods and factors affecting heat transfer efficiency
- Gain knowledge on heat exchanger selection and performance optimization
- Explore best practices for inspection, maintenance, and cleaning techniques
- Develop troubleshooting skills to identify and resolve common heat exchanger problems
- Address

Course Outline

• 01 DAY ONE

Fundamentals of Heat Exchangers

- Introduction to heat exchangers and their functions
- Types of heat exchangers and their applications
- Heat transfer methods: conduction, convection, and radiation
- Shell and tube heat exchangers: arrangement and flow

• 02 DAY TWO

Heat Transfer & Common Maintenance Issues

- Direct contact heat exchangers: types and designs
- Heat exchanger maintenance challenges
- Heat transfer equipment components
- Tube bundles, tube sheets, and joint layouts
- Classification of heat exchangers based on applications

• 03 DAY THREE

Heat Transfer Through Tubes & Applications

- Large steam system condensers
- Air conditioner evaporators and condensers
- Radiators, pre-heaters, boilers, gas heaters, and liquid heaters
- Innovations in shell and tube heat exchanger designs

• 04 DAY FOUR

Heat Exchanger Operations & Troubleshooting

- Identifying fouling, corrosion, and vibration issues
- Cavitation, recirculation, and flow turbulence problems
- Blockage detection and removal techniques
- Leakage prevention using sacrificial anodes

• 05 DAY FIVE

Inspection, Cleaning & Maintenance Techniques

- Inspection methods for leak detection (vacuum test, dye test)
- Cleaning strategies: mechanical and chemical cleaning
- Tube-side and shell-side cleaning procedures
- Safety equipment and best practices for maintenance
- Repair techniques: plugging, welding, and tube replacement
- Final review, evaluation, and course closeout

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 1, 2025	June 5, 2025	5 days	4250.00 \$	KSA - Jeddah
Sept. 1, 2025	Sept. 5, 2025	5 days	4950.00 \$	England - London
Dec. 22, 2025	Dec. 26, 2025	5 days	4250.00 \$	UAE - Dubai

FROM	TO	DURATION	FEES	LOCATION
May 12, 2025	May 16, 2025	5 days	4950.00 \$	England - London