QUEST
Professional Center

PROFESSIONAL TRAINING COURSE

Course No. 1141

Heat Exchanger Technology Training Course

MECHANICAL ENGINEERING
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION
5 Days

DELIVERY
Classroom

LOCATION
Rome, Italy

DATES
28 Dec 2026 – 1 Jan 2027

Scheduled Event Details

CITY	Rome, Italy
DATE	28 Dec 2026 – 1 Jan 2027
DELIVERY TYPE	Classroom
COURSE FEE	€7,000

Course Overview

The Heat Exchanger Technology Training Course is a comprehensive professional development program designed to equip engineers, maintenance professionals, operations personnel, technical specialists, and engineering managers with the knowledge and practical skills required to understand, design, operate, maintain, troubleshoot, and optimize heat exchangers used across a wide range of industrial applications. Heat exchangers are essential process equipment in oil and gas, petrochemical, power generation, manufacturing, HVAC, food processing, pharmaceutical, and process industries, where efficient heat transfer directly impacts operational efficiency, energy consumption, product quality, and equipment reliability.

Modern industrial facilities rely on heat exchangers to maximize thermal efficiency, recover waste heat, control process temperatures, and improve overall plant performance. Improper design, inadequate maintenance, fouling, corrosion, scaling, and inefficient operation can significantly reduce heat transfer efficiency, increase operating costs, and contribute to unplanned downtime. This course provides participants with internationally recognized engineering principles and industry best practices that enable organizations to improve thermal performance, extend equipment life, and optimize operational reliability.

Throughout the program, participants will develop a comprehensive understanding of heat transfer principles, heat exchanger design concepts, thermal and hydraulic performance analysis, equipment selection, shell-and-tube heat exchangers, plate heat exchangers, air-cooled heat exchangers, condensers, evaporators, cooling systems, fouling mechanisms, corrosion control, maintenance strategies, inspection techniques, condition monitoring, failure analysis, and energy optimization. Practical engineering applications and real industrial case studies ensure participants gain both technical knowledge and practical implementation skills.

The Heat Exchanger Technology Training Course also demonstrates how heat exchanger

technology integrates with maintenance management, reliability engineering, asset management, energy management, process optimization, operational excellence, engineering safety, and sustainability initiatives. By completing this course, participants will be prepared to improve equipment reliability, optimize thermal efficiency, reduce maintenance costs, enhance energy performance, strengthen engineering decision-making, and support sustainable engineering operations across government entities, ministries, public sector organizations, financial institutions managing engineering infrastructure, oil and gas companies, power generation facilities, petrochemical industries, manufacturing organizations, utilities, and multinational corporations.

Objectives

- Analyze the engineering principles of heat transfer and industrial heat exchanger operation.
- Develop practical knowledge for selecting heat exchangers based on process requirements and operating conditions.
- Evaluate heat exchanger performance using thermal calculations, hydraulic analysis, and engineering performance indicators.
- Apply heat transfer and fluid mechanics principles to improve heat exchanger efficiency.
- Design operational improvement strategies that enhance thermal performance, equipment reliability, and energy efficiency.
- Improve heat exchanger operation through effective installation, commissioning, monitoring, and maintenance practices.
- Strengthen troubleshooting capabilities by identifying common heat exchanger failures and conducting root cause analysis.
- Implement preventive, predictive, and reliability-centered maintenance strategies for heat exchanger systems.
- Assess energy utilization, fouling effects, and opportunities for thermal performance optimization.
- Align heat exchanger management practices with organizational objectives for safety, asset management, operational excellence, and sustainability.

Who Should Attend

This course is designed for mechanical engineers, process engineers, maintenance engineers, operations engineers, reliability engineers, energy engineers, project engineers, plant engineers, utility engineers, equipment engineers, maintenance supervisors, operations supervisors, engineering technicians, maintenance planners, equipment inspectors, commissioning engineers,

engineering consultants, and technical professionals responsible for heat exchangers and thermal systems.

The program is equally valuable for engineering managers, maintenance managers, operations managers, plant managers, facility managers, asset management professionals, project managers, procurement engineers, quality specialists, HSE professionals, technical advisors, executive managers, and decision makers responsible for thermal equipment reliability, energy efficiency, maintenance planning, engineering operations, and industrial asset management.

Professionals working within government entities, ministries, public sector organizations, financial institutions managing engineering infrastructure, oil and gas companies, petrochemical industries, power generation facilities, manufacturing plants, water treatment facilities, HVAC operations, refineries, mining organizations, utility providers, infrastructure developers, and multinational engineering organizations will benefit significantly from the practical engineering methodologies and internationally recognized heat exchanger management practices covered throughout the course.

Learning Outcomes

- By the end of this course, participants will be able to:
- Explain the operating principles, classifications, and industrial applications of heat exchangers.
- Select appropriate heat exchangers based on process conditions, thermal requirements, and operating environments.
- Analyze thermal and hydraulic performance using engineering calculations and performance evaluation methods.
- Apply heat transfer and fluid mechanics principles to optimize heat exchanger operation.
- Identify common operational problems, including fouling, corrosion, scaling, leakage, and thermal performance degradation.
- Develop preventive and predictive maintenance programs for heat exchanger systems.
- Apply inspection techniques and condition monitoring methods to improve equipment reliability.
- Improve thermal efficiency and reduce energy consumption through operational optimization.
- Apply engineering safety practices during heat exchanger installation, operation, inspection, cleaning, and maintenance.
- Support operational excellence, sustainability, and asset reliability through effective heat exchanger engineering and lifecycle management.

Course Outline

DAY 01

Fundamentals of Heat Exchanger Technology

- Principles of heat transfer and thermal energy exchange
- Types of industrial heat exchangers and their applications
- Heat exchanger components and construction
- Fluid properties and thermal performance fundamentals

> **PRACTICAL**
> Practical workshop on identifying heat exchanger types and interpreting engineering drawings and technical specifications

DAY 02

Heat Exchanger Design and Performance Analysis

- Heat exchanger design principles
- Thermal calculations and heat transfer analysis
- Hydraulic analysis and pressure drop calculations
- Equipment selection based on process requirements

> **PRACTICAL EXERCISE**
> Practical exercise on evaluating heat exchanger performance and equipment sizing

DAY 03

Heat Exchanger Operation and Maintenance

- Installation, commissioning, startup, and shutdown procedures
- Operational monitoring and performance optimization
- Preventive, predictive, and reliability-centered maintenance strategies
- Cleaning techniques, fouling control, and corrosion management

DAY 03 — CONTINUED

PRACTICAL

Practical workshop on maintenance planning and inspection procedures

DAY 04

Troubleshooting, Reliability, and Energy Optimization

- Common heat exchanger failures and root cause analysis
- Inspection methods and condition monitoring technologies
- Reliability improvement methodologies for thermal equipment
- Energy efficiency optimization and thermal performance enhancement

PRACTICAL APPLICATION

Practical application involving heat exchanger troubleshooting and operational improvement planning

DAY 05

Advanced Heat Exchanger Management and Operational Excellence

- Heat exchanger asset lifecycle management
- Engineering safety and operational risk management
- Performance measurement and engineering best practices
- Continuous improvement strategies for thermal systems

FINAL WORKSHOP

Final workshop involving the development of a comprehensive Heat Exchanger Technology management plan integrating thermal performance analysis, equipment selection, maintenance planning, reliability improvement, condition monitoring, energy optimization, safety management, and continuous improvement to maximize equipment reliability, operational efficiency, and engineering excellence.

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Register or Request More Information

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