



Mechanical Engineering

Potable Water Systems Maintenance

Course Introduction

This training program is designed to provide participants with a deeper understanding of the critical aspects of maintaining, troubleshooting, and optimizing potable water systems.

The program covers advanced concepts in water treatment, distribution, pump and valve systems, leak detection, water quality monitoring, and system sustainability, aiming to prepare professionals to manage and maintain water systems with high efficiency, reliability, and safety.

Target Audience

- Maintenance engineers and technicians working in potable water systems.
- Water treatment plant operators and managers.
- Civil engineers and system designers involved in water infrastructure development.
- Professionals seeking to enhance their expertise in managing and optimizing water distribution and treatment systems.

Learning Objectives

- Design, operate, and maintain advanced potable water systems with high reliability and efficiency.
- Apply cutting-edge water treatment technologies to ensure water safety, compliance, and quality.
- Implement advanced maintenance protocols for pumps, valves, and other mechanical systems in the water distribution network.
- Optimize water system performance by utilizing hydraulic modeling and real-time monitoring systems.

- Use leak detection technologies to identify and address issues proactively, reducing water loss and enhancing system longevity.
- Ensure compliance with water quality standards and regulatory requirements while maintaining high safety standards in water system operations.
- Integrate sustainability practices and energy-efficient technologies to reduce operational costs and environmental impacts.

Course Outline

• 01 DAY ONE

Module 1: Introduction to Advanced Potable Water Systems

- Overview of potable water systems and their components.
- Key challenges in maintaining large-scale water systems.
- Current and emerging technologies in water distribution and treatment.

Module 2: Advanced Water Treatment Technologies

- In-depth exploration of advanced filtration systems (membranes, reverse osmosis).
- Chemical dosing systems and optimization techniques for disinfection.
- Innovations in UV and ozone treatment technologies.
- Treatment of specific contaminants (heavy metals, emerging pollutants).

• 02 DAY TWO

Module 3: Potable Water System Design and Optimization

- Hydraulic modeling of water distribution networks.
- Pressure zone management and distribution network optimization.
- Pipe sizing, material selection, and corrosion prevention.
- Energy-efficient design principles for potable water systems.

Module 4: Pumps, Valves, and Mechanical Systems Maintenance

- Advanced pump types and selection criteria (centrifugal, screw, diaphragm).
- Valve maintenance: installation, calibration, and troubleshooting.
- Energy management practices in pump systems.
- Predictive maintenance using vibration analysis and thermography.

Module 5: Leak Detection, Prevention, and Pipeline Integrity

- Principles of leak detection (acoustic, flow-based, pressure monitoring).
- Techniques for effective pipeline integrity management.
- Use of smart sensors, IoT, and SCADA systems for real-time leak detection.
- Case studies on successful leak detection and repair strategies.

• 03 DAY THREE

Module 6: Water Quality Monitoring and Regulatory Compliance

- Water quality parameters: monitoring and control techniques.
- Regulatory standards for potable water quality (e.g., WHO, EPA).
- Real-time water quality monitoring and data analysis.
- Reporting and compliance with health and safety regulations.

Module 7: Sustainability and Energy Efficiency in Water Systems

- Energy-efficient water pumping systems and equipment.
- Renewable energy integration into water treatment and distribution.
- Water reuse, recycling, and conservation practices in urban systems.
- Case studies on sustainable water management.

Module 8: Advanced Troubleshooting and Preventive Maintenance

- Diagnosing and troubleshooting issues in water distribution systems.
- Strategies for proactive maintenance planning and execution.
- Use of diagnostic tools for monitoring system health (flow meters, pressure sensors, etc.).
- Minimizing system downtime and optimizing response times.

Confirmed Sessions

| FROM | TO | DURATION | FEES | LOCATION |
|---------------|---------------|----------|------------|------------------|
| May 19, 2025 | May 21, 2025 | 3 days | 3250.00 \$ | UAE - Abu Dhabi |
| Aug. 24, 2025 | Aug. 26, 2025 | 3 days | 3250.00 \$ | KSA - Riyadh |
| Dec. 1, 2025 | Dec. 3, 2025 | 3 days | 3950.00 \$ | England - London |