

**Training  
Course**

**Pump Operation, Maintenance  
and Troubleshooting**

## Course Plan

### Introduction

Pumps are essential components in a wide range of industries including water treatment, oil and gas, petrochemicals, HVAC systems, and manufacturing. Their proper operation, maintenance, and troubleshooting are critical to ensure system reliability and efficiency. This course equips participants with the theoretical knowledge and hands-on skills to operate, maintain, and troubleshoot various types of pumps effectively.

### Course Objectives:

- ✓ Identify different types of pumps and their applications.
- ✓ Understand the working principles of centrifugal and positive displacement pumps.
- ✓ Apply proper pump start-up and shut-down procedures.
- ✓ Implement preventive and corrective maintenance techniques.
- ✓ Diagnose and troubleshoot common pump failures.
- ✓ Make informed repair or replacement decisions.
- ✓ Interpret and analyze pump performance curves.
- ✓ Improve pump efficiency and reduce energy consumption.

## Who Should Attend?

- Mechanical Maintenance Technicians
- Pump Operators
- Field and Plant Engineers
- Maintenance Supervisors
- Technical and Engineering Students

## Training Methods:

- ✓ Online Video material.
- ✓ Presentation.
- ✓ Live Interactive sessions.
- ✓ Course presenter will make extensive use of all tools that will be needed for the virtual environment.
- ✓ Questions & Answers

## Course Outline:

### Day One

- Introduction to Pumping Systems and Industrial Applications
- Types of Pumps: Centrifugal vs. Positive Displacement
- Main Components of Pumps and Their Functions
- Operating Principles of Centrifugal Pumps
- Operating Principles of Positive Displacement Pumps

### Day Two

- Flow, Head, and Pressure Calculations
- Reading and Understanding Pump Performance Curves
- Best Efficiency Point (BEP) and Its Importance
- Pump Selection Criteria Based on Application
- Installation of Pumps and Piping Layout

### Day Three

- Start-up and Shut-down Procedures
- Preventive and Predictive Maintenance Techniques
- Lubrication and Vibration Control
- Mechanical Seals: Inspection and Maintenance
- Pump and Motor Alignment Techniques

### Day Four

- Common Pump Problems and Their Causes (Cavitation, Overheating, etc.)
- Troubleshooting Methods and Tools
- Manual and Automatic Pump Control Systems
- Deep Well and Feedwater Pumps
- Corrective Maintenance and Repair Planning

### Day Five

- Suction and Discharge Piping Design Considerations
- Energy Management and Pump Efficiency Optimization
- Workplace Safety and Best Practices Around Pumps
- Real-world Case Studies and Problem Solving
- Practical Sessions and/or Virtual Simulations

## Training Details

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|--------------------------|--|
| Course Duration          | 5 Days   |
| Pre-Schedule             | 22 - 26 Sept 2025  |
| Venue                    | Madrid - Spain - Perciados hotel   |
| Training Fees Per Person | KWD 1800 (One Thousand Eight Hundred Only )  |
| Course Fees Include      | <ul style="list-style-type: none"> <li>✓ Tuition documentation</li> <li>✓ Curriculum and Training Handout</li> <li>✓ Five star Lunch</li> <li>✓ Completion Certificates</li> </ul> |