MAWA EVENTS

Address: No. 857, Block A2. Leisure Commerce Square - No 9., 46150 Petaling Jaya, Selangor, Malaysia

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POSITIVE DISPLACEMENT PUMP MASTERCLASS - RECIPROCATING PUMP & ROTARY PUMP WORKING PRINCIPLES

""Mastering the Design, Operation, and Maintenance of Positive Displacement Pumps for Industrial Applications""

Schedule

Date	Venue	Fees (Face-to-Face)
15 – 19 Mar 2026	Doha, Qatar	USD 3495 per delegate

Introduction

Positive displacement pumps—especially reciprocating and rotary types—are essential components in industries where precise fluid handling, high pressure, and viscosity control are critical. Whether for oil & gas, petrochemicals, power generation, or water treatment, a deep understanding of pump principles, configurations, and operational behavior is vital for ensuring reliability and efficiency.

This intensive five-day masterclass offers comprehensive technical knowledge of positive displacement pumps, covering both reciprocating and rotary pump technologies. Participants will learn the fundamentals of pump operation, component functions, selection criteria, maintenance procedures, failure modes, and troubleshooting techniques through interactive sessions, case studies, and practical workshops.

Objectives

By the end of this course, participants will be able to:

- Explain the working principles of reciprocating and rotary positive displacement pumps
- Identify key components and configurations of various pump types
- Select appropriate pumps for different industrial fluids and operating conditions
- Apply diagnostic tools to detect faults, vibrations, and performance issues
- Perform routine maintenance and implement reliability-centered improvements

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Why Attend

- Gain practical, hands-on knowledge of positive displacement pump systems
- Improve pump selection and application decisions across different industries
- Enhance troubleshooting skills and reduce unplanned downtime
- Learn maintenance strategies that extend equipment life and performance
- Ensure compliance with international standards and safety practices

Target Audience

This program is designed for:

- Mechanical and maintenance engineers
- Plant operators and pump technicians
- Reliability engineers and maintenance planners
- Professionals involved in fluid transfer, utilities, and process systems
- Engineering staff responsible for design, selection, or commissioning of pump systems

Individual Benefits

Key competencies that will be developed include:

- Understanding pump behavior under varying load and flow conditions
- Interpreting pump curves, specifications, and performance data
- Troubleshooting noise, vibration, cavitation, and seal failures
- Applying lubrication, alignment, and preventive maintenance practices
- Performing system analysis and pump efficiency evaluations

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Increased equipment uptime through proactive maintenance
- Optimized pump selection and sizing based on system demand
- Fewer failures due to enhanced operational awareness
- Better root cause analysis and corrective action implementation
- Improved compliance with environmental and safety requirements

Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings – Core concepts in pump mechanics and operations
- Case Studies – Industry-specific examples of performance issues and solutions
- Workshops – Pump dismantling, alignment checks, and fault analysis
- Peer Exchange – Experience sharing on reliability and failure prevention
- Tools – Maintenance checklists, troubleshooting guides, and pump data sheets

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Course Outline

Detailed 5-Day Course Outline

Training Hours: 07:30 AM – 3:30 PM **Daily Format:** 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Fundamentals of Positive Displacement Pumping

- Module 1: Overview of Pump Classifications (07:30 – 09:30) • Dynamic vs positive displacement pumps; key applications
- Module 2: Working Principles of Reciprocating Pumps (09:45 – 11:15) • Single/double-acting, piston vs plunger mechanisms
- Module 3: Key Components and Operation of Reciprocating Pumps (11:30 – 01:00) • Valves, seals, crankshaft mechanisms, and flow control
- Module 4: Workshop – Identifying Pump Configurations (02:00 – 03:30)

Day 2: Rotary Pump Design and Operation

- Module 1: Rotary Pump Types and Applications (07:30 – 09:30) • Gear, screw, vane, and lobe pumps – operating features
- Module 2: Flow Characteristics and Pump Curves (09:45 – 11:15) • Pressure/flow relationships, system curve matching
- Module 3: Lubrication and Cooling of Pump Internals (11:30 – 01:00) • Bearing protection, fluid film lubrication
- Module 4: Workshop – Rotary Pump Disassembly & Fault Detection (02:00 – 03:30)

Day 3: Selection, Sizing, and System Integration

- Module 1: Pump Sizing and Specification Techniques (07:30 – 09:30) • Flow rate, viscosity, NPSH, pressure requirements
- Module 2: Installation and Alignment Best Practices (09:45 – 11:15) • Baseplate setup, coupling types, pipe strain mitigation
- Module 3: System Layout Considerations (11:30 – 01:00) • Suction design, check valves, pulsation dampeners
- Module 4: Workshop – Sizing a Pump for an Industrial Application (02:00 – 03:30)

Day 4: Troubleshooting and Maintenance

- Module 1: Common Failure Modes and Root Causes (07:30 – 09:30) • Seal wear, cavitation, overpressure, thermal stress
- Module 2: Predictive Maintenance Tools (09:45 – 11:15) • Vibration analysis, thermography, condition monitoring
- Module 3: Scheduled vs Reactive Maintenance Approaches (11:30 – 01:00) • RCM, spare parts planning, overhaul intervals
- Module 4: Workshop – Diagnosing Pump Failures from Field Data (02:00 – 03:30)

Day 5: Safety, Efficiency, and Operational Best Practices

- Module 1: Pump System Energy Efficiency (07:30 – 09:30) • Power consumption, system losses, upgrade opportunities
- Module 2: Pump Safety and Environmental Considerations (09:45 – 11:15) • Pressure hazards, leakage, emission control
- Module 3: Final Review and Performance Optimization (11:30 – 01:00) • Summary of design, operation, and reliability practices
- Module 4: Certification and Wrap-Up (02:00 – 03:30) • Participant Q&A, course evaluation, and certificate distribution

Certification

Participants will receive a Certificate of Completion in Positive Displacement Pump Masterclass, validating their expertise in the operation, maintenance, and troubleshooting of reciprocating and rotary pump systems used in industrial environments.

Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
- **Industry-Leading Faculty:** Courses delivered by seasoned professionals with hands-on experience.
- **Practical Insights:** Learn to turn theory into actionable strategies for real-world business impact.
- **Client-Focused Solutions:** Customized programs designed to achieve your organisation’s unique goals.

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In-House / Customized Training Interested in running this course for your team? Please contact us:	TEL: **+601116373203**	EMAIL: **info@mawaevents.net**