MERCURY

Fluid Machinery Excellence: Operation, and Maintenance of Pumps, Compressors, and Turbines

28 February – 4 March 2027
Amman (Jordan)



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Ref: 6046_242679 **Date:** 28 February – 4 March 2027 **Location:** Amman (Jordan) **Fees:** 4200 Euro

Introduction:

Fluids and the machinery that move them - such as pumps, compressors, and turbines - are integral to various sectors, including oil refineries, gas production facilities, and power generation. In this fluid machinery, operation, and maintenance of pumps and turbines course, the participants will learn that The importance of understanding fluid mechanics fundamentals and applications within these machines cannot be understated due to their role in efficiently transporting liquids, gasses, or mixtures that may include solids.

The evolution of fluid machinery design and application has resulted in the removal of limitations concerning pressure, temperature, and the nature of fluids being handled. However, this advancement brings mechanical, hydraulic, operating, and economic challenges that must be addressed. A thorough grasp of the principles of fluid flow in these machines and piping systems is vital for successful design, installation, and operation. Real-life examples will illuminate common misconceptions and guide participants to optimize the performance of fluid machinery.

This comprehensive fluid machinery, operation, and maintenance of pumps and turbines course offers insight into the operation, maintenance, and management of fluid machinery, encompassing the fundamentals of fluid mechanics and applications critical to the fields of chemical processing, power generation, and more. Participants will delve into fluid mechanics types, gain expertise in machinery selection, and receive specialized machinery operator training that covers turbine machinery and pump repair and maintenance training.

Targeted Groups:

- Chemical, Process, and Mechanical Engineers.
- Product Engineers and Technologists.
- The operation, technical service, and maintenance professionals.
- Engineers, Consultants, and Specialists in related fields.
- Technical professionals are responsible for interdisciplinary energy projects.

Course Objectives:

Participants in the fluid machinery, operation, and maintenance of pumps and turbines course will be empowered to:

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- Understand the technical features of different types of fluid machinery and their operational limits.
- Learn hydraulic and mechanical design principles of fluid machinery as per global standards.
- Acquire skills in selecting the ideal type and size of machinery for specific industrial requirements.
- Diagnose inefficiencies in machinery function and identify improvement strategies.
- Master best practices and troubleshooting techniques for issues like cavitation, surge, and erosion.

Targeted Competencies:

By the end of this fluid machinery, operation, and maintenance of pumps and turbines course, the target competencies will be able to:

- Principles of selecting appropriate pumps, compressors, and turbines for a given application.
- Practical considerations for the consistent performance of fluid machinery in various contexts.
- A balanced understanding of fluid flow principles and empirical industry experience.
- Guidelines for machinery installation, operation, and maintenance to efficiently address operational problems.
- Economic considerations in cost-benefit analysis.

Course Content:

Unit 1: Centrifugal Pumps:

- Overview of various pump types based on design and application.
- Global standards and regulations for pump design.
- Core components of centrifugal pump construction.
- Designing optimal pump-suction piping systems.
- Criteria for selecting and sizing centrifugal pumps.
- Approaches to solve operational problems in pumps.

Unit 2: Positive Displacement Pumps:

- Types of positive displacement pumps: Reciprocating and Rotary.
- Pump requirements across different industries.
- Specialty pumps and their applications.
- Recommendations for pump installation and operation.
- Techniques for pump inspection, performance testing, and maintenance.
- Strategies for troubleshooting pump-related issues.

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Unit 3: Centrifugal Compressors:

- Overview of the main features of various types of compressors.
- Classification of compressors based on design and application.
- World standards and codes related to compressor design.
- Main elements of centrifugal compressor construction.
- Analysis of centrifugal compressor efficiency.
- Guidelines for trouble-free centrifugal compressor operation.

Unit 4: Positive Displacement Compressors:

- An examination of reciprocating and rotary compressors.
- Selecting cost-effective compressors based on specific criteria.
- Managing compressor loadings, speeds, noise, and safety.
- Custom compressors for non-standard applications.
- Guidelines on compressor installation, operation, and maintenance.
- Inspection procedures and troubleshooting methods for compressors.

Unit 5: Industrial Gas Turbines:

- Overview and categorization of gas turbines.
- Standards and codes are relevant to gas turbine design.
- Principal elements and technical specs of gas turbine construction.
- Comparing Radial and Axial-flow gas turbines.
- Combustor efficiency with respect to fuel types, combustion, and pollution control.
- Preventative measures against gas turbine deterioration.
- Approaches to vibration monitoring and diagnostics in turbines.
- Tactics for the installation, operation, and maintenance of gas turbines.