



PUMPS AND COMPRESSORS OPERATION



COURSE OVERVIEW

The course is devoted to pumps and compressors design features, efficiencies, operating characteristics, reliability, and maintenance implications of pumps and compressors. This course will cover the operating principles of pumps and compressors, specifications, their design, the effects of efficiency on operating costs, energy usage, and effect on plant costs, selection, troubleshooting, and maintenance. This course teaches:

- The function of pumps in the plant and the pump classification
- Positive displacement pumps: working principle, and classification
- Positive displacement pumps selection, operation and maintenance
- Centrifugal pumps working principle, components and performance curves
- Centrifugal pump selection, operation and maintenance
- Centrifugal pump piping system & piping components
- Centrifugal pump operation, priming and flow control system
- Centrifugal pump operational problems and maintenance problems
- The function of the compressor in the plant and the compressor classification
- Centrifugal compressor: working principle, components and classification
- Centrifugal compressor performance curves
- Positive displacement compressors classification, working principle of each group, and the application of each group.

DATES, VENUES AND FEES



27 – 31 July 2025 - Doha

(5 Days)

Fees

US\$ 4500

Note: Fee is per participant + 5% VAT (if applicable).

Groups from the same company can enjoy a **discounted** price.

CONTACT US NOW

+971 (4) 4539841 – 42 – 43
WhatsApp: +971 52 398 7781

Millennium Solutions Training Center FZ-LLC
First Floor, Office #134, Knowledge Park, Block 2B, Dubai, UAE

Email: info@mstcme.com
Website: www.mstcme.com





WHO SHOULD ATTEND?

This course is appropriate for a wide range of professionals but not limited to:

- Operation and Maintenance Engineers
- Maintenance Technicians
- Maintenance Senior Technicians

LEARNING OBJECTIVES

Upon completion of this course, participants will have gained a thorough understanding of the various pumps and compressors, compressors configurations available to virtually every industrial user. Items discussed include mechanical design features, sizing and application criteria, maintainability, reliability, vulnerability, and troubleshooting issues.

Participants will also acquire knowledge of operating and maintenance issues by getting to know pump design, machinery components, piping design, and proven approaches to monitoring, troubleshooting, and maintenance of pump installations.

On the other hand, participants will have gained a thorough understanding of the various compressors, compressor configurations and the working principle and components of each type.

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

- Describe the working principle of each type of pumps.
- Understand Guidelines and rules that must be followed for their successful application.
- Understand their basic designs, specification and selection criteria, and sizing calculations.
- Understand Pumps and compressors: Maintenance issues including vibration analysis and used oil analysis
- Carry out troubleshooting of critical components with knowledge of common failure modes of pumps and compressors by applying advanced fault detection techniques.
- Determine the maintenance required to minimize pumps and compressors downtime, pump operating cost and maximize their efficiency, reliability, and useful life.

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ACCREDITATION



This training course is certified by CPD.

The CPD Certification Service is the leading independent CPD accreditation institution operating across industry sectors to complement the Continuing Professional Development policies of professional institutes and academic bodies. The CPD Certification Service provides support, advice, and recognised independent CPD accreditation compatible with global CPD principles. CPD is the term used to describe the learning activities professionals engage in to develop and enhance their abilities and keep skills and knowledge up to date. CPD Units are only awarded to programmes after each programme is scrutinised to ensure integrity and quality according to CPD standards and benchmarks.

COURSE CERTIFICATE

MSTC certificate will be issued to all attendees completing a minimum of 80% of the total tuition hours of the course.

CPD internationally recognized certificate will be issued for all participants who will meet the course requirements. CPD certificates will be issued within a month of the successful completion of the course.

TRAINING METHODOLOGY

- Expert instructor lecture, input using numerous visual aids
- Supportive comprehensive course manual enabling practical application and reinforcement
- Participant discussion and involvement regarding their specific projects and challenges
- Real-world case studies and best practices

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COURSE OUTLINE

DAY 1

- Pre test
- Overview: The function of the pumps in the plant and pump types
- Pump & pumping terminology
- Centrifugal pumps: Working principle, components and classification
- Centrifugal pump operation and performance curves
- Centrifugal pumps installation, piping system and piping components
- Operation and maintenance problems.
- Overview: The various methods of sealing rotating equipment
- Fundamentals of mechanical seals, working principle and components
- Symptoms indicates centrifugal pump problems

DAY 2

- When do you need to stop centrifugal pump for inspection and overhauling
- The required steps to strip down the pump
- The required inspection for the centrifugal pump components
- General comments during re-assemble of the pump
- Mechanical seal installation
- Required checks after assemble the pump, running test
- Seal failures- causes and analyses of damage
- Mechanical seals repair Centrifugal compressor surge and surge prevention systems.

DAY 3

- Centrifugal pump predictive and preventive maintenance techniques
- How to improve the centrifugal pump efficiency? Determine all the futures that improve the efficiency and reliability of centrifugal pump efficiency.
- Positive displacement pumps operational problems
- Positive displacement pumps inspection and overhauling

Compressors

- What is the function of the compressor in the plant?
- Compressor terminology and technical terms
- Classification of compressors: Positive displacement and centrifugal compressors.
- Positive displacement compressors: Reciprocating and rotary positive displacement compressors.
- Reciprocating compressor: Working principle, components, and reciprocating compressor performance curves.

DAY 4

- Positive displacement compressors piping system, system components and their function.
- Reciprocating compressors multi-staging
- Reciprocating compressors monitoring system and operational problems.
- Reciprocating compressor operational problems and maintenance troubleshooting.
- Symptoms indicate reciprocating compressor problems
- Determine all the futures that improve the efficiency and reliability of reciprocating compressor efficiency?

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COURSE OUTLINE

DAY 4

Cont'd.

- Reciprocating compressor selection for specific application
- Dynamic compressors: Centrifugal compressors, axial flow compressors working principle and components of each design.
- Centrifugal compressors: Working principle, components, and compressor performance curves.
- Mechanical Design of Centrifugal Compressors:
- Compressor Side Streams, Rotors, Balancing, Rotor Dynamics, Impellers, Casings, Bearings, Seals, Couplings, Controls
- Centrifugal compressor multi-staging
- Dry mechanical seals as used in centrifugal compressors
- Centrifugal compressors piping system, system components and their function.

DAY 5

- Centrifugal compressors monitoring system and operational problems.
- Centrifugal compressor operational problems and maintenance troubleshooting.
- Centrifugal compressor surge and surge prevention systems.
- Selection of centrifugal compressor for specific application
- Centrifugal compressor train inspection, maintenance and overhauling
- Centrifugal compressor predictive and preventive maintenance techniques
- How to improve the centrifugal compressor efficiency? Determine all the futures that improve the efficiency and reliability of centrifugal compressor efficiency.
- Open discussion for specific technical problems and case study
- Post test

Ending the course ceremony & evaluation of the course

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