MERCURY

Centrifugal Compressor & Steam Turbine Course

18 – 22 April 2027
Cairo (Egypt)



Dubai - UAE: +971 4 450 5697
Istanbul - Türkiye: +90 539 599 1206
Amman - Jordan: +962 79 712 3347

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Ref: 9083_302068 **Date:** 18 – 22 April 2027 **Location:** Cairo (Egypt) **Fees:** 4000 Euro

Introduction:

A complete understanding of the design, functioning, and maintenance of centrifugal compressors and steam turbines is a prerequisite for the successful operation of process plants. This is especially important nowadays when the demand for minimum and continuous production is vital for organizations' competitiveness.

This centrifugal compressor and steam turbine course will feature the importance of proper design, operation, and maintenance of various designs and applications of centrifugal compressors and steam turbines, which are encountered throughout chemical and process industries, including oil refineries, gas production facilities, power generation, and other engineering fields.

This centrifugal compressor and steam turbine course will familiarize engineers, technicians, and operators with the guidelines and best practices for utilizing this equipment, including design, operation, maintenance, and repair. The emphasis of the training seminar will be on a physical understanding of the problems in operation and the best way of troubleshooting them.

Targeted Groups:

- Chemical, Process, and Mechanical Engineers.
- Product Engineers and Technologists.
- The operation, Technical Service, and Maintenance Professionals.
- Engineers, Consultants, and Sales Professionals.
- Technical Professionals are responsible for interdisciplinary energy projects.

Course Objectives:

At the end of this centrifugal compressor and steam turbine course, the participants will be able to:

- Understand the technical features of centrifugal compressors and steam turbines.
- Select the optimal type and size of equipment for a given industrial application.
- Use methods of estimating the degree of deterioration and inefficiency of equipment.
- Apply best practices and techniques for pinpointing the root cause of problems.
- Choose the most efficient remedies and troubleshooting techniques in operation.

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Targeted Competencies:

At the end of this centrifugal compressor and steam turbine course, the target competencies will be able to:

- Principles of selecting suitable centrifugal compressors and steam turbines for the given application.
- Practical issues related to the trouble-free functioning of centrifugal compressors and steam turbines.
- Explanation of aerodynamic instabilities of centrifugal compressors and thermal instabilities of steam turbines.
- Guidelines for the design, operation, maintenance, and troubleshooting.
- Maintenance and repair economic issues: cost and benefit analysis.

Advanced Training in Gas & Steam Turbines and Centrifugal Compressors:

This centrifugal compressor and steam turbine course offers advanced training for professionals eager to expand their expertise in gas and steam turbines and centrifugal compressor turbines.

The centrifugal compressor and steam turbine program includes modules that define the centrifugal compressor and its critical role in conjunction with steam turbines, particularly within the power generation sector.

This centrifugal compressor and steam turbine training honed skills in centrifugal compressor operation, maintenance, and troubleshooting, ensuring that participants are well-versed in the optimal approach to extending the life cycle of these vital industrial components.

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Course Content:

Unit 1: Gas Thermodynamics:

- Gas Properties and Laws.
- Centrifugal Compressor Aerodynamics - Thermodynamics.
- Changes in Gas Velocity and Pressure in a Centrifugal Compressor.
- Mass and Volume Flow Rate as a Pressure, Temperature, and Gas Composition Function.
- Molecular Weight of Gas and its Effect on Performance.
- Discharge Temperature, Power Absorbed as a Function of the Gas Composition, and the Operating Conditions.
- Investigating and Controlling Surge and Choke.

Unit 2: Centrifugal Compressors - Design and Operation:

- 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 3: Steam Thermodynamics:

- Steam Properties and the Mollier Charts.
- The Rankine Cycle.
- Steam Requirement per KWH Production.
- Ultra-supercritical Conditions.

Unit 4: Steam Turbines - Design and Operation:

- Main Elements and Technical Characteristics of Steam Turbine Design.
- The Rotating and Stationary Blades.
- The Internal and External Seals.
- Radial and Thrust Journal Bearings.
- Stop-Control - Non-Return Turbine Valves.
- Turbine Controls and Interlocks.

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Unit 5: Maintenance of Rotating Machines:

- Machines Piping and Ground Regulations.
- Alignment of Thermal Machines.
- Balancing of Rotating Machines.
- Surface Treatments of Sealing Interfaces.
- Online Washing.
- Troubleshooting through Vibration Analysis, Oil Analysis, and Thermography.

Conclusion:

Participants can earn a certification in the operation and maintenance of centrifugal compressors and steam turbines. This steam turbine training course delves deeper into the intricacies of these machines, covering advanced aspects such as centrifugal compressor performance, analysis, and calculations.

Through hands-on experience and theoretical knowledge, technicians and engineers will learn to define centrifugal compressor parameters and understand the benefits of electric centrifugal compressors in practical applications.