

Course No. 1139

Gas Turbine Engineering Training Course

MECHANICAL ENGINEERING
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Gas Turbine Engineering Training Course is a comprehensive professional development program designed to equip engineers, maintenance professionals, operations personnel, technical specialists, and engineering managers with the knowledge and practical skills required to understand, operate, maintain, troubleshoot, and optimize industrial gas turbines. As gas turbines play a critical role in power generation, oil and gas production, petrochemical processing, aviation support systems, and industrial energy applications, a thorough understanding of gas turbine engineering is essential for ensuring operational reliability, energy efficiency, equipment integrity, and sustainable plant performance.

Gas turbines operate under demanding mechanical and thermal conditions, requiring specialized engineering knowledge in thermodynamics, combustion systems, rotating equipment, control systems, materials engineering, maintenance strategies, and performance optimization. Effective gas turbine management enables organizations to improve equipment availability, reduce fuel consumption, minimize operational risks, extend asset life, and support safe and reliable plant operations. This course provides participants with internationally recognized engineering principles and industry best practices for managing gas turbine systems throughout their operational lifecycle.

Throughout the program, participants will develop a comprehensive understanding of gas turbine technologies, including turbine components, Brayton cycle fundamentals, combustion processes, compressor and turbine sections, auxiliary systems, lubrication and cooling systems, vibration monitoring, performance analysis, condition monitoring, maintenance planning, failure analysis, reliability engineering, and operational optimization. Practical engineering applications and real industrial case studies enable participants to strengthen technical decision-making while addressing real-world operational challenges.

The Gas Turbine Engineering Training Course also demonstrates how gas turbine engineering integrates with maintenance management, reliability engineering, asset management, operational excellence, energy management, process optimization, safety management, and continuous improvement initiatives. By completing this course, participants will be prepared to improve turbine reliability, optimize operational performance, reduce maintenance costs, enhance energy efficiency, strengthen engineering decision-making, and support sustainable engineering operations across government entities, ministries, public sector organizations, financial institutions managing engineering infrastructure, oil and gas companies, power generation facilities, petrochemical industries, utilities, manufacturing organizations, and multinational corporations.

Objectives

- Analyze the operating principles and engineering applications of industrial gas turbines.
- Develop practical knowledge for selecting, operating, and managing gas turbine systems.
- Evaluate gas turbine performance using engineering calculations, operational data, and performance analysis techniques.
- Apply thermodynamic principles and Brayton cycle analysis to gas turbine operation.
- Design operational improvement strategies that enhance gas turbine efficiency, reliability, and availability.
- Improve gas turbine operation through effective commissioning, monitoring, maintenance, and troubleshooting practices.
- Strengthen diagnostic capabilities by identifying common gas turbine failures and conducting root cause analysis.
- Implement preventive, predictive, and reliability-centered maintenance strategies for gas turbines.
- Assess turbine efficiency, fuel consumption, emissions, and opportunities for performance optimization.
- Align gas turbine engineering practices with organizational objectives for safety, reliability, asset management, and operational excellence.

Who Should Attend

This course is designed for mechanical engineers, maintenance engineers, operations engineers, rotating equipment engineers, reliability engineers, power plant engineers, process engineers, project engineers, utility engineers, commissioning engineers, maintenance supervisors, operations supervisors, engineering technicians, equipment inspectors, asset management professionals, engineering consultants, and technical specialists responsible for gas turbine systems and power generation equipment.

The program is equally valuable for engineering managers, maintenance managers, plant managers, operations managers, facility managers, project managers, technical advisors, procurement engineers, HSE professionals, quality specialists, executive managers, and decision makers responsible for turbine reliability, maintenance planning, operational performance, engineering asset management, and energy efficiency initiatives.

Professionals working within government entities, ministries, public sector organizations, financial institutions managing engineering infrastructure, oil and gas companies, power generation plants, petrochemical facilities, utility providers, industrial manufacturing organizations, LNG facilities, refineries, offshore installations, infrastructure developers, and multinational engineering organizations will benefit significantly from the practical engineering methodologies and internationally recognized gas turbine management practices covered throughout the course.

Learning Outcomes

- By the end of this course, participants will be able to:
- Explain the operating principles, components, and industrial applications of gas turbines.
- Analyze gas turbine performance using thermodynamic principles and engineering calculations.
- Interpret gas turbine operating parameters and evaluate equipment efficiency.
- Apply engineering principles to optimize turbine operation and fuel efficiency.
- Identify common gas turbine failures and conduct systematic troubleshooting and root cause analysis.
- Develop preventive and predictive maintenance programs for gas turbine systems.
- Evaluate lubrication systems, cooling systems, combustion systems, and auxiliary equipment.
- Apply vibration monitoring and condition monitoring techniques to improve turbine reliability.
- Implement engineering safety practices during turbine operation, inspection, maintenance, and shutdown activities.
- Support operational excellence and asset reliability through effective gas turbine engineering and lifecycle management.

Course Outline

DAY 01

Fundamentals of Gas Turbine Engineering

- Principles of gas turbine operation and the Brayton cycle
- Types of industrial gas turbines and their applications
- Major gas turbine components and system configuration
- Thermodynamics, combustion principles, and energy conversion

DAY 01 — CONTINUED

PRACTICAL

Practical workshop on gas turbine identification and interpretation of technical documentation

DAY 02

Gas Turbine Performance and System Design

- Gas turbine performance characteristics
- Compressor, combustion chamber, and turbine section analysis
- Fuel systems and combustion optimization
- Auxiliary systems including lubrication, cooling, and sealing

PRACTICAL EXERCISE

Practical exercise on gas turbine performance evaluation and operational analysis

DAY 03

Gas Turbine Operation and Maintenance

- Installation, commissioning, startup, and shutdown procedures
- Operational monitoring and performance optimization
- Preventive, predictive, and reliability-centered maintenance strategies
- Inspection techniques and maintenance planning

PRACTICAL

Practical workshop on maintenance scheduling and operational inspections

DAY 04

Troubleshooting, Reliability, and Condition Monitoring

- Common gas turbine failures and root cause analysis
- Vibration analysis and condition monitoring technologies
- Reliability engineering methodologies for gas turbines

DAY 04 — CONTINUED

- Performance degradation analysis and efficiency improvement

PRACTICAL APPLICATION

Practical application involving turbine troubleshooting and reliability improvement planning

DAY 05

Advanced Gas Turbine Management and Operational Excellence

- Gas turbine asset lifecycle management
- Engineering safety and operational risk management
- Performance measurement and engineering best practices
- Continuous improvement strategies for gas turbine operations

FINAL WORKSHOP

Final workshop involving the development of a comprehensive Gas Turbine Engineering management plan integrating turbine performance analysis, maintenance planning, reliability improvement, condition monitoring, energy optimization, safety management, and continuous improvement to maximize equipment reliability, operational efficiency, and engineering excellence.

Register or Request More Information

Course page: <https://quest-training.com/courses/gas-turbine-engineering-training-course>

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