Fundamentals of Process and Mechanical Technology

7 - 18 July 2024
Online

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REF: E400 DATE: 7 - 18 July 2024 Venue: Online - Fee: 3750 Euro

Introduction:

This training program provides comprehensive instruction on the core principles and practices essential for professionals in the process and mechanical engineering fields. Through this program, attendees will gain insights into key concepts, tools, and techniques relevant to process and mechanical technology.

Program Objectives:

At the end of this program, participants will be able to:

- Apply practical understanding of central issues in process & mechanical engineering in oil, gas, petrochemical, chemical, and allied facilities.
- Understand fundamental principles used in processes & facilities & apply a practical understanding of essential process units & classes of units involved in separations, heat exchange & reactions.
- Apply practical understanding to static & rotating mechanical equipment & related condition mentoring & inspection techniques.
- Understand mechanical testing methods, Failure Mechanisms & Fitness for Service, NDT & principles of corrosion & corrosion protection.
- Perform relevant calculations & analyses to assist in the operation, sizing, & troubleshooting of chemical processes & mechanical equipment.

Targeted Audience:

- Petroleum Engineers.
- Maintenance & Production Engineers.
- Process Engineers.
- R&D Chemists, Plant Chemists.
- Economists & Business Managers.

Program Outlines:

Unit 1:

Overview of Process and Mechanical Technology:

- Introduction to process technology and mechanical engineering.
- Importance of understanding fundamental principles in industrial settings.
- Overview of equipment and systems encountered in process industries.
- Basic principles of fluid mechanics, thermodynamics, and mechanics.
- Role of process and mechanical technology in various industries.

Unit 2:

Mechanical Principles and Applications:

- Understanding mechanical properties of materials.
- Basics of statics and dynamics.
- Application of mechanical principles in machine design.
- Introduction to mechanisms and mechanical systems.
- Principles of force analysis and load distribution.

Unit 3:

Process Technology Fundamentals:

- Overview of chemical and physical processes.
- Principles of mass and energy balance.
- Introduction to process instrumentation and control.
- Understanding unit operations and unit processes.
- Role of process technology in industrial production.

Unit 4:

Heat Transfer and Thermodynamics:

- Fundamentals of heat transfer mechanisms.
- Basic principles of thermodynamics.
- Application of heat transfer and thermodynamics in process industries.
- Heat exchangers and their applications.

- Thermodynamic cycles and energy conversion processes.

Unit 7:

Fluid Mechanics and Hydraulics:

- Basics of fluid properties and behavior.
- Principles of fluid statics and dynamics.
- Application of fluid mechanics in piping systems.
- Introduction to hydraulic systems and components.
- Fluid flow measurement techniques and devices.

Unit 6:

Mechanical Equipment and Systems:

- Overview of mechanical equipment used in process industries.
- Principles of operation and maintenance of pumps, compressors, and turbines.
- Understanding of mechanical power transmission systems.
- Introduction to material handling equipment.
- Role of mechanical equipment in industrial processes.

Unit 7:

Process Control and Instrumentation:

- Basics of process control systems.
- Introduction to instrumentation and control devices.
- Principles of feedback and feedforward control.
- Understanding of control loops and tuning techniques.
- Role of process control in ensuring operational efficiency.

Unit 8:

Safety and Environmental Considerations:

- Importance of safety in process and mechanical technology.
- Overview of industrial safety standards and regulations.
- Hazard identification and risk assessment techniques.
- Environmental impact of industrial processes.
- Strategies for mitigating safety and environmental risks.

Unit 9:

Equipment Maintenance and Reliability:

- Importance of equipment maintenance in industrial operations.
- Basics of preventive, predictive, and corrective maintenance.
- Introduction to reliability-centered maintenance RCM.
- Techniques for equipment troubleshooting and diagnostics.
- Role of maintenance in ensuring equipment reliability and uptime.

Unit 10:

Emerging Technologies in Process and Mechanical Technology:

- Overview of recent advancements in process and mechanical technology.
- Introduction to Industry 4.0 and its impact on industrial processes.
- Emerging trends in automation, robotics, and digitalization.
- Application of artificial intelligence and machine learning in process industries.
- Future prospects and challenges in the field of process and mechanical technology.