BLACKBIRD FOR TRAINING

Oil & Gas Process Engineering and Facilities Design

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Introduction

The Oil & Gas Process Engineering and Facilities Design course delivers a comprehensive understanding of the principles, practices, and tools required to design and optimize oil and gas facilities.
It covers process engineering fundamentals, equipment selection, plant layout, and operational considerations to ensure efficiency, safety, and environmental compliance.
This course is aimed at engineers, project managers, supervisors, and technical professionals seeking to enhance their ability to design, evaluate, and manage oil and gas production facilities effectively.

Course Objectives

- Understand the core principles of oil and gas process engineering.
- Analyze process flow diagrams PFDs and piping and instrumentation diagrams P&IDs.
- Select appropriate equipment for oil, gas, and water processing.
- Apply safety and environmental standards in facility design.
- Optimize plant layout for operational efficiency.
- Perform basic calculations for process design.
- Assess facility performance and identify improvements.
- Review case studies of facility design projects.

Course Modules

Day 1: Fundamentals of Oil & Gas Process Engineering

- Overview of upstream, midstream, and downstream processes.
- Key principles of process engineering.
- Understanding fluid properties and behavior.
- Introduction to process simulation tools.
- Review of process flow diagrams PFDs.
- Exercise: interpreting a PFD for a basic facility.

Day 2: Process Equipment and System Design

- Separation equipment: two-phase and three-phase separators.
- Gas treatment systems.
- Oil dehydration and desalting units.
- Pumps, compressors, and heat exchangers.
- Storage tanks and pressure vessels.
- Exercise: equipment sizing basics.

Day 3: Piping, Instrumentation, and Control Systems

- Piping materials and design considerations.
- Understanding piping and instrumentation diagrams P&IDs.
- Control systems and instrumentation basics.
- Safety instrumented systems SIS.
- Valves, actuators, and control devices.
- Exercise: analyzing a P&ID for a process facility.

Day 4: Facility Layout and Safety Considerations

- Principles of plant layout design.
- Hazardous area classification.
- Fire and gas detection systems.
- Ergonomic and operational accessibility in layout.
- Environmental and regulatory compliance.
- Exercise: layout optimization for safety and efficiency.

Day 5: Optimization, Troubleshooting, and Case Studies

- Identifying operational bottlenecks.
- Techniques for process optimization.
- Troubleshooting process issues.
- Integrating new technologies into existing facilities.
- Review of real-world design challenges.
- Final exercise: design and present a facility layout.

Why Attend this Course: Wins & Losses!

- Gain comprehensive knowledge of process engineering and facility design.
- Learn to read and interpret PFDs and P&IDs.
- Understand equipment selection and design criteria.
- Apply safety and environmental standards effectively.
- Improve decision-making in facility design projects.
- Enhance plant performance and operational efficiency.
- Build practical skills through real case studies.
- Earn a professional certificate of completion.

Conclusion

The Oil & Gas Process Engineering and Facilities Design course provides participants with the technical skills and practical insights needed to excel in facility design and process optimization.

Through structured modules and practical exercises, attendees will gain the expertise to design safe, efficient, and compliant oil and gas facilities, improving operational performance and supporting long-term production goals.