AMERICAN GLOBAL INSTITUTE FOR PRIVATE TRAINING

External Training Course

Next-Gen Petroleum Laboratory Excellence: Advanced Analytics & Global Standards

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From 23 Mar. 2026 To 27 Mar. 2026
From 27 Apr. 2026 To 01 May 2026
From 25 May 2026 To 29 May 2026

Marriot Marble Arch Hotel, London, UK

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External Training Course:

Next-Gen Petroleum Laboratory Excellence: Advanced Analytics & Global Standards

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Course Overview

This comprehensive five-day training program is designed to strengthen operational performance, analytical precision, and quality excellence within modern petroleum laboratories. The course focuses on advanced hydrocarbon testing methodologies, laboratory data integrity, international compliance frameworks, and performance-driven laboratory systems aligned with global industry standards. Participants will gain practical knowledge of modern analytical technologies, quality assurance practices, and measurement reliability principles used across upstream, midstream, and downstream oil & gas laboratories. The program integrates technical depth with operational application, enabling laboratory professionals to enhance accuracy, improve efficiency, and support critical production and quality decisions with confidence. By combining advanced analytical techniques, international standards, and next-generation laboratory strategies, this course equips participants with the tools needed to drive consistency, compliance, and continuous improvement in petroleum laboratory environments.

Course Objectives

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

- Apply advanced petroleum analytical techniques to improve testing precision and reliability.
- Strengthen laboratory operational efficiency through structured workflows and best practices.
- Implement effective quality control and quality assurance systems aligned with international standards.
- Interpret hydrocarbon testing data accurately to support operational and production decisions.
- Enhance compliance readiness with global laboratory frameworks and accreditation requirements.
- Reduce analytical errors through proper calibration, validation, and measurement uncertainty management.
- Improve data integrity, traceability, and reporting accuracy.
- Utilize statistical tools to monitor and control laboratory performance.
- Identify and mitigate operational and safety risks within petroleum laboratory environments.
- Contribute to continuous improvement initiatives that elevate laboratory excellence and global competitiveness.

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Training Methodology

Interactive technical sessions.
Case studies from refinery and upstream/downstream laboratories.
Practical data interpretation exercises.
Group workshops and scenario discussions.
Real-world petroleum testing applications.

Organizational Impact

Improved laboratory accuracy and credibility.
Stronger compliance with international standards.
Reduced operational risks and testing inconsistencies.
Enhanced efficiency in petroleum quality verification.
Higher reliability in refinery and production decision-making.

Personal Impact

Stronger analytical confidence.
Improved technical knowledge in hydrocarbon testing.
Greater understanding of global laboratory standards.
Enhanced professional credibility in oil & gas laboratories.

Course Content & Outline

Day 1: Modern Petroleum Laboratory Operations & Workflow Optimization

- Petroleum laboratory structure across upstream, midstream & downstream.
- Roles, responsibilities & operational coordination.
- Sample receiving, preparation & chain of custody.
- Laboratory documentation & reporting standards.
- Operational workflow optimization.
- Key laboratory performance indicators (KPIs).
- Risk awareness in petroleum testing environments.
- Introduction to global laboratory best practices.

Day 2: Advanced Hydrocarbon Analytical Techniques

- Crude oil characterization methods.
- Gas Chromatography (GC) applications in petroleum labs.
- Distillation & physical property testing.
- Spectroscopic techniques (UV, IR) in hydrocarbon analysis.
- Fuel specification testing & compliance.
- Detection of contaminants & additives.
- Method selection & validation principles.
- Instrument troubleshooting & performance optimization.

Day 3: Quality Assurance & International Standards

- Laboratory Quality Management Systems (QMS).
- ISO 17025 principles & implementation.
- Internal audits & compliance readiness.
- Proficiency testing & inter-laboratory comparison.
- Measurement uncertainty fundamentals.
- Root cause analysis for analytical deviations.
- Documentation control & record integrity.
- Continuous improvement strategies.

Day 4: Data Integrity, Accuracy & Statistical Control

- Statistical Quality Control (SQC) tools.
- Data validation & verification techniques.
- Calibration management & traceability.
- Error prevention & deviation management.
- Laboratory Information Management Systems (LIMS) overview.
- Digital transformation in petroleum laboratories.
- Ensuring data integrity & cybersecurity awareness.
- Professional technical reporting practices.

Day 5: Safety, Risk Management & Laboratory Excellence Strategy

- Chemical hazard identification in petroleum labs.
- Safe handling of hydrocarbons & flammable materials.
- Environmental compliance considerations.
- Emergency response & incident preparedness.
- Laboratory risk assessment frameworks.
- Building a culture of analytical excellence.
- Performance benchmarking against global standards.
- Developing a Next-Generation laboratory improvement roadmap.

Course Agenda:

(1st Day) Agenda

9.00	11.30	Discuss Course Major Points • Modern Petroleum Laboratory Operations & Workflow Optimization. • Advanced Hydrocarbon Analytical Techniques. • Quality Assurance & International Standards. • Data Integrity, Accuracy & Statistical Control. • Safety, Risk Management & Laboratory Excellence Strategy.
11.30	12.00	Coffee Break
12.00	14.00	Modern Petroleum Laboratory Operations & Workflow Optimization • Petroleum laboratory structure across upstream, midstream & downstream. • Roles, responsibilities & operational coordination. • Sample receiving, preparation & chain of custody. • Laboratory documentation & reporting standards. • Operational workflow optimization. • Key laboratory performance indicators (KPIs). • Risk awareness in petroleum testing environments. • Introduction to global laboratory best practices.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

(2nd Day) Agenda

9.00	11.30	Advanced Hydrocarbon Analytical Techniques • Crude oil characterization methods. • Gas Chromatography (GC) applications in petroleum labs. • Distillation & physical property testing. • Spectroscopic techniques (UV, IR) in hydrocarbon analysis.
11.30	12.00	Coffee Break
12.00	14.00	Advanced Hydrocarbon Analytical Techniques • Fuel specification testing & compliance. • Detection of contaminants & additives. • Method selection & validation principles. • Instrument troubleshooting & performance optimization.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

(3rd Day) Agenda

9.00	11.30	Quality Assurance & International Standards • Laboratory Quality Management Systems (QMS). • ISO 17025 principles & implementation. • Internal audits & compliance readiness. • Proficiency testing & inter-laboratory comparison.
11.30	12.00	Coffee Break
12.00	14.00	Quality Assurance & International Standards • Measurement uncertainty fundamentals. • Root cause analysis for analytical deviations. • Documentation control & record integrity. • Continuous improvement strategies.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

(4th Day) Agenda

9.00	11.30	Data Integrity, Accuracy & Statistical Control • Statistical Quality Control (SQC) tools. • Data validation & verification techniques. • Calibration management & traceability. • Error prevention & deviation management.
11.30	12.00	Coffee Break
12.00	14.00	Data Integrity, Accuracy & Statistical Control • Laboratory Information Management Systems (LIMS) overview. • Digital transformation in petroleum laboratories. • Ensuring data integrity & cybersecurity awareness. • Professional technical reporting practices.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

(5th Day) Agenda

9.00	11.30	Safety, Risk Management & Laboratory Excellence Strategy • Chemical hazard identification in petroleum labs. • Safe handling of hydrocarbons & flammable materials. • Environmental compliance considerations. • Emergency response & incident preparedness.
11.30	12.00	Coffee Break
12.00	14.00	Safety, Risk Management & Laboratory Excellence Strategy • Chemical hazard identification in petroleum labs. • Safe handling of hydrocarbons & flammable materials. • Environmental compliance considerations. • Emergency response & incident preparedness.
14.00	14.30	Questions, Discussion & Conclusion Training Course.
14.30		Buffet Lunch