AMERICAN GLOBAL INSTITUTE
FOR PRIVATE TRAINING

External Training Course

Gas Chromatography and Troubleshooting for the Oil & Gas Industry

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From 12 May To 16 May 2025
From 21 Jul. To 25 Jul. 2025
From 20 Oct. To 24 Oct. 2025

Marriot Marble Arch Hotel, London, UK

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External Training Course:

Gas Chromatography and Troubleshooting for the Oil & Gas Industry

From 12 May To 16 May 2025 **Fees: 2500 KD**
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Course Overview:

Gas Chromatography (GC) plays a vital role in the Oil & Gas industry for the analysis of hydrocarbon streams, process control, quality assurance, and environmental monitoring. Accurate and reliable GC analysis is essential to support operational decisions, product specifications, and compliance requirements. This comprehensive 5-day training course provides participants with detailed knowledge of Gas Chromatography principles, method development, system operation, and advanced troubleshooting techniques specifically aligned with Oil & Gas industry requirements. The course blends theoretical concepts with practical problem-solving strategies to empower laboratory personnel, engineers, and technical professionals to maximize the performance, reliability, and accuracy of GC systems.

Course Objectives:

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

- Understand the fundamentals of Gas Chromatography and its applications in Oil & Gas.
- Operate and maintain laboratory and process GC systems effectively.
- Troubleshoot common GC problems and apply corrective actions.
- Optimize GC analysis for hydrocarbon mixtures and process streams.
- Implement best practices for preventive maintenance and data quality assurance.
- Interpret chromatograms and deliver accurate analytical reports.

Target Audience:

Laboratory Technicians & Chemists.
Process Engineers & Operation Technologists.
Quality Control & Quality Assurance Personnel.
Instrumentation & Maintenance Engineers.
Oil & Gas Laboratory Managers.
Technical Supervisors and Professionals involved in analytical testing.

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Course Content & Outline:

Day One: Fundamentals of Gas Chromatography

- Introduction to Analytical Techniques in Oil & Gas.
- Overview of Gas Chromatography Principles.
- GC Instrument Components: Injectors, Columns, Detectors.
- Gas Chromatography Applications in Oil & Gas Industry.
- Laboratory and On-line GC Systems Overview.

Day Two: GC Operation & Method Development

- Carrier Gas Selection and Flow Control.
- Sample Injection Techniques and Sample Preparation.
- Column Selection Criteria.
- Detector Types: FID, TCD, PID, and Others.
- Method Development Strategies.
- Calibration, Standardization, and Data Quality Control.

Day Three: GC Troubleshooting & Problem Solving

- Identifying Common GC Issues:
  - No Peaks / Broad Peaks / Tailing / Ghost Peaks / Baseline Noise.
- Troubleshooting Carrier Gas Systems.
- Leak Detection Techniques.
- Maintenance of Injectors, Columns, and Detectors.
- Preventive Maintenance Programs.

Day Four: Advanced Applications in Oil & Gas

- Natural Gas Analysis and Composition Determination.
- BTU, Heating Value, and Wobbe Index Calculations.
- Hydrocarbon Dew Point Analysis.
- Sulfur Compounds and Trace Analysis.
- On-line GC Systems for Process Control.

Day Five: Practical Workshop, Case Studies & Best Practices

- Real-world Troubleshooting Scenarios.
- Data Interpretation & Chromatogram Analysis.
- Maintenance Scheduling & Documentation.
- GC Safety Practices & Handling Procedures.
- Group Discussions & Q&A.
- Final Review & Course Evaluation.

Course Details & Agenda:

1st Day Agenda

8.30	9.00	Opening Remarks (30 Min.).
9.00	11.30	DISCUSS COURSE TOBICS: • Fundamentals of Gas Chromatography. • GC Operation & Method Development. • GC Troubleshooting & Problem Solving. • Advanced Applications in Oil & Gas. • Practical Workshop, Case Studies & Best Practices.
11.30	12.00	Coffee Break
12.00	15.00	Fundamentals of Gas Chromatography: • Introduction to Analytical Techniques in Oil & Gas. • Overview of Gas Chromatography Principles. • GC Instrument Components: Injectors, Columns, Detectors. • Gas Chromatography Applications in Oil & Gas Industry. • Laboratory and On-line GC Systems Overview.
15.00	15.30	Questions and Discussion
15.30		Buffet Lunch

2nd Day Agenda

9.00	11.30	GC Operation & Method Development: • Carrier Gas Selection and Flow Control. • Sample Injection Techniques and Sample Preparation. • Column Selection Criteria.
11.30	12.00	Coffee Break
12.00	15.00	GC Operation & Method Development: • Detector Types: FID, TCD, PID, and Others. • Method Development Strategies. • Calibration, Standardization, and Data Quality Control.
15.00	15.30	Questions and Discussion
15.30		Buffet Lunch

3rd Day Agenda

9.00	11.30	GC Troubleshooting & Problem Solving: • Identifying Common GC Issues: - No Peaks / Broad Peaks / Tailing / Ghost Peaks / Baseline Noise. • Troubleshooting Carrier Gas Systems.
11.30	12.00	Coffee Break
12.00	15.00	GC Troubleshooting & Problem Solving: • Leak Detection Techniques. • Maintenance of Injectors, Columns, and Detectors. • Preventive Maintenance Programs.
15.00	15.30	Questions and Discussion
15.30		Buffet Lunch

4th Day Agenda

9.00	11.30	Advanced Applications in Oil & Gas: • Natural Gas Analysis and Composition Determination. • BTU, Heating Value, and Wobbe Index Calculations. • Hydrocarbon Dew Point Analysis.
11.30	12.00	Coffee Break
12.00	15.00	Advanced Applications in Oil & Gas: • Sulfur Compounds and Trace Analysis. • On-line GC Systems for Process Control.
15.00	15.30	Questions and Discussion
15.30		Buffet Lunch

5th Day Agenda

9.00	11.30	Practical Workshop, Case Studies & Best Practices: • Real-world Troubleshooting Scenarios. • Data Interpretation & Chromatogram Analysis. • Maintenance Scheduling & Documentation.
11.30	12.00	Coffee Break
12.00	15.00	Practical Workshop, Case Studies & Best Practices: • GC Safety Practices & Handling Procedures. • Group Discussions & Q&A. • Final Review & Course Evaluation.
15.00	15.30	Questions, Discussion & Conclusion Training Course.
15.30		Buffet Lunch