JUPITER PRIME
Consulting • Training • Advisory
جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Gas and Liquid Chromatography Troubleshooting Training Course

1 – 5 February 2027
Paris

Gas and Liquid Chromatography Troubleshooting Training Course

Ref: 1553_57188 **Date:** 1 – 5 February 2027 **Location:** Paris **Fees:** 6900 GBP

Gas and Liquid Chromatography Troubleshooting is a 1-week training course for laboratory analysts, chemists and lab supervisors in refineries and petrochemical plants, and it ends with a chromatography troubleshooting checklist built for their own GC and HPLC instruments. Product certificates, blending decisions and process control depend on chromatograms that are accurate, repeatable and available when operations need them. This course is delivered by Jupiter Prime Training.

Why Gas and Liquid Chromatography Troubleshooting Matters Now

Three pressures shape chromatography in hydrocarbon laboratories today. Tighter fuel and polymer-grade specifications leave less room for drifting retention times or poorly integrated peaks. Many laboratories run with fewer experienced analysts, so systematic fault-finding must replace trial and error. Customers, auditors and process engineers increasingly question data quality when results disagree with plant behaviour. A laboratory that diagnoses faults quickly protects product release and avoids rework; one that cannot loses instrument time and credibility. The course rests on chromatographic theory, structured method validation and calibration practice, and a symptom-to-cause approach to fault diagnosis.

Who Gains Most from Gas and Liquid Chromatography Troubleshooting

- Laboratory analysts who run GC and HPLC methods on daily samples
- Chemists who develop, transfer and validate chromatographic methods
- Lab supervisors who sign off results and schedule instrument maintenance
- Quality officers who track calibration records and proficiency results
- Instrument technicians who replace columns, liners, seals and lamps

A refinery or petrochemical quality laboratory gains most when its analysts, chemists and instrument technicians attend together and adopt one diagnostic sequence.

Gas and Liquid Chromatography Troubleshooting Capabilities

Participants read a chromatogram as evidence, linking each symptom to the hardware or chemistry behind it.

- Select GC and HPLC columns and conditions for hydrocarbon matrices — method set-up decisions
- Assess detector choice and response for target analytes — sensitivity and selectivity needs
- Diagnose peak tailing, fronting, splitting and ghost peaks — corrective maintenance actions
- Test baseline noise, drift and retention shifts against likely causes — instrument release to service
- Apply calibration and system suitability checks — result approval by supervisors

- Design method validation for accuracy, precision and limits — quality and audit stakeholders

Key Gas and Liquid Chromatography Troubleshooting Terms

- Retention time — the time an analyte takes to pass through the column to the detector under set conditions.
- Resolution — a measure of how completely two adjacent peaks are separated in a chromatogram.
- Peak tailing — an asymmetric peak with a drawn-out trailing edge, often caused by active sites or dead volume.
- Baseline drift — a slow upward or downward movement of the detector signal when no analyte elutes.
- System suitability — checks run before samples to confirm the chromatographic system performs within agreed limits.
- Method validation — documented evidence that an analytical method is fit for its intended measurement.

Gas and Liquid Chromatography Troubleshooting Day by Day

Day 1: Separation Principles and Laboratory Context

- Chromatographic Theory, Plates and Resolution — Setting Realistic Separation Targets
- Hydrocarbon Sample Types and Matrices — Choosing GC Or HPLC
- Carrier Gas, Mobile Phase and Purity — Effects On Detector Stability
- Sample Preparation and Injection Technique — Avoiding Errors Before The Column
- Data Systems and Integration Settings — Reliable Peak Area Reporting

Day 2: Columns, Inlets and Detectors

- Capillary and Packed GC Columns — Phase And Dimension Selection
- Split, Splitless and On-Column Inlets — Discrimination And Repeatability
- FID, TCD and Selective GC Detectors — Matching Detector To Analyte
- Reversed-Phase and Normal-Phase HPLC Columns — Selectivity For Aromatics And Additives
- UV, Refractive Index and Fluorescence Detectors — HPLC Sensitivity Choices

Day 3: Diagnosing Chromatographic Faults

- Peak Shape Diagnosis for Tailing and Fronting — Active Sites And Overload
- Ghost Peaks, Carryover and Contamination — Cleaning And Blank Strategy
- Baseline Noise, Drift and Spikes — Electrical, Gas And Solvent Causes
- Retention Time Shifts and Pressure Changes — Leaks, Flow And Temperature
- HPLC Pump, Seal and Degasser Faults — Preventive Maintenance Intervals

Day 4: Calibration, Validation and Data Quality

- External, Internal Standard and Area Normalisation — Calibration Strategy Selection
- System Suitability Criteria — Batch Acceptance Before Reporting
- Method Validation for Accuracy, Precision and Linearity — Fitness For Purpose
- Detection Limits and Measurement Uncertainty — Reporting Low-Level Results
- Control Charts and Proficiency Results — Ongoing Laboratory Performance

Day 5: Practising the Chromatography Troubleshooting Checklist

- Mapping Symptoms to Causes for Own Instruments — Diagnostic Decision Tree
- Case Studies from Fuel and Polymer Laboratories — Applying Fault Sequences
- Maintenance Triggers from System Suitability Data — Planned Interventions
- Documenting Corrective Actions and Records — Audit-Ready Evidence
- Completing the Chromatography Troubleshooting Checklist — Laboratory Adoption

Applying Gas and Liquid Chromatography Troubleshooting After the Course

- Lead a review of recent out-of-limit system suitability results and trace each to a column, inlet or detector cause.
- Run a peak integration audit on one routine GC method to confirm consistent baseline and area settings across analysts.

Gas and Liquid Chromatography Troubleshooting Questions FAQ

What is gas and liquid chromatography troubleshooting and why does it matter now?

It is the systematic diagnosis of faults in GC and HPLC separations, detectors and data. It matters now because tighter specifications and leaner laboratories demand fast, defensible fixes rather than repeated trial runs.

Which roles gain most from gas and liquid chromatography troubleshooting?

Laboratory analysts, chemists, lab supervisors, quality officers and instrument technicians gain most, since each runs, maintains or signs off chromatographic results.

How does gas and liquid chromatography troubleshooting differ from a basic instrumental analysis course?

It concentrates on diagnosing and preventing faults across GC and HPLC. A basic instrumental analysis course introduces many techniques at overview level, whereas here you work through symptoms, causes, validation and calibration in depth.

What do you bring back from gas and liquid chromatography troubleshooting?

You bring back a troubleshooting checklist for your own instruments, linking common symptoms to causes, checks and corrective actions, plus a calibration and system suitability routine.

Gas and Liquid Chromatography Troubleshooting: The Way Forward

The chromatography troubleshooting checklist first informs the response to the next out-of-limit result, used by analysts, chemists and instrument technicians at the bench. After its first use, revisit the symptom-to-cause map: record which causes actually explained each fault, reorder the checks accordingly and adjust preventive maintenance intervals for the instruments involved.