



## TRAINING PROGRAM



# BASIC CHROMATOGRAPHY TECHNIQUE OPERATION, APPLICATION AND ANALYSIS TROUBLESHOOTING

## Introduction:

---

The purpose of this course is to provide training in the fundamental techniques of both gas chromatography (GC) and liquid chromatography (HPLC). The course covers: major components of a chromatography; operating principles; application; calibration methods; set-up procedures; preventative maintenance; troubleshooting methods; quantitative methods and failure modes for each, along with practical examples. The course also discusses other aspects such as optimization of column lengths, flows, temperatures and pressure with the necessary theoretical information in each part. The aim of this course is to enrich and advance the skills and knowledge of participants and to teach them chromatography technique operation.

## Who Should Attend?

---

The course is designed for chemists, lab technicians, chemical engineers, instrument engineers and lab supervisors/managers.

## Methodology:

---

This interactive Training will be highly interactive, with opportunities to advance your opinions and ideas and will include;

- Lectures
- Workshop & Work Presentation
- Case Studies and Practical Exercise
- Videos and General Discussions

## Certificate:

---

**BTS** attendance certificate will be issued to all attendees completing minimum of 80% of the total course duration

## Course Objectives:

---

**By the end of this course delegates will be able to:**

- To impart participants with the fundamental techniques and knowledge of chromatography.
- To familiarize participants with the tools and techniques used in chromatography analyses, cause and effect diagrams, calibration and standard analysis methods.
- To provide the skills, knowledge and understanding of principles of chromatography analysis application.
- To use a routine maintenance.
- To impart participants the operation technique.
- To train participants to know how to change and install all chromatography components.
- To be familiar with of the latest analytical methods.

## Course Outline:

---

- Fundamental chromatography technique
- Chromatographic theory parameters
- Chromatography retention process
- Separation methods
- Application of chromatography
- Solid phase extraction method
- Derivatization method
- Standard operation method
- Successful and safe operating procedure
- Gas chromatography technique
- Carrier gas and pressure regulator system
- Split/splitless inlet system
- Cool on-column inlet and programmed temperature vaporization inlet
- Column configuration
- Detector configuration
- Maintenance and installation procedure for inject system, column and detectors
- Liquid chromatography technique
- Mobile phase solvent
- Pumping system
- Column and detector types
- Operation method of HPLC
- Overview of liquid chromatographic separation methods
- Application of liquid chromatography
- Ion chromatographic method
- Size-exclusion chromatographic method
- Supercritical fluid chromatography
- Instrumentation and operating variables
- Chromatography variables effect
- Techniques to minimize peak broadening
- Column condition and regeneration technique
- Maintenance and installation procedure for inject system, column, pump and detectors
- Troubleshooting and approaches to solve problems

- Quantitative methods: calibration methods, external and internal standards, outliers test, determination of analyte concentration, standard addition method, error in quantitative analysis, confidence limits, detection limit, repeatability, reproducibility and method validation,