Training Title
GAS CHROMATOGRAPHY (GC) OPERATION, CALIBRATION, TROUBLESHOOTING AND PRACTICE MAINTENANCE

Training Duration
5 days

Training Venue and Dates

LM033	Gas Chromatography (GC) Operation, Calibration, Troubleshooting and Practice Maintenance	5	12-16 February 2024	$5,500	Dubai, UAE

In any of the 5-star hotels. The exact venue will be informed of soon.

Training Fees
- **$5,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch**

Training Certificate
Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION
The course covers the major components and subsystems of a gas chromatography and its accessories, including inject system, columns, detectors and data system. It presents operating principles, calibration methods, set-up procedures, and failure modes for each along with practical examples. Preventative maintenance is covered with emphasis on maintaining analysis and troubleshooting methods. The course discusses optimization of column lengths, flows, and temperatures and includes the necessary theoretical information in each part. This course is designed for the new or experienced GC practitioner who wishes to increase instrument uptime and laboratory productivity.

The course also includes the practical maintenance where the important parts of GC are demonstrated i.e., inject system part, different liner and syringes, maintenance kit, different columns type, FID detector, and other accessory parts which is variable used.

TRAINING OBJECTIVES
1. **The aim is to provide firsthand information to the participants on optimal use of Gas chromatography (GC).**
2. **A special emphasis on applications, maintenance and troubleshooting.**
3. **Imparting participants with the fundamental technique knowledge of Gas Chromatography.**

4. To understand GC maintenance methods as a routine check.
5. Knowledge of accessories and consumables required for GC operation.
6. Good laboratory practices for accurate, reliable and get it right-first analysis.
7. Introduction to applications of analysis and method development.
8. To familiarize participants to the advance techniques for achieving gas chromatography analysis, qualitative and quantitative methods, cause and effect diagrams and standard calibration graph.

WHO SHOULD ATTEND

All technicians, chemists, chemical engineers, instrument engineers, supervisors and managers who work in any laboratory field i.e., medical, biological, oil, environment, water, etc.

TRAINING METHODOLOGY:

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of the multiple-choice type will be made available on a daily basis to examine the effectiveness of delivering the course.

Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work& Practical Exercises
- 20% Videos& General Discussions

COURSE OUTLINE

Day1

- Fundamental And Theory
- Introduction
- Modern Chromatography Methods
- Overview Of Gc System Components
- Theory Parameters
- Gas Chromatography Components
- Carrier Gas and Pressure Regulator System
- Carrier Gas Selection
- Regulator Selection
- Gas Purity Filters
- Sample Introduction Components
- Split Inlet System

- Split less Inlet System
- Cool On-Column Inlet
- Programmed Temperature Vaporization Inlet
- Column Configuration
- Detector Types and Configuration

DAY 2
- Retention Process
- Stationary Phase for Capillary Column
- Stationary Phase for Packed Column
- Stationary Phase Interaction
- Manipulation Methods
- Solid Phase Extraction Method
- Derivatization Method
- Derivatization For Detector
- Standard Operation Method
- Operating Procedure
- Successful And Safe Operate
- Refinery Gas Analysis Technique
- PCB-Oil Sample Analysis Technique
- Biological Analysis Technique

Day 3
- Maintenance And Installation Procedures
- Inject System
- Column
- Detector
- Instrumental Problems and Troubleshooting
- Approaches To Solve Gc Problems
- Band Broadening
- Baseline Deviation
- Peak Shape Problems
- Flat Top Peaks
- Split Peaks
- Negative Peaks
- Excessively Broad Solvent Front

Day 4
- Loss Of Resolution
- Retention Changes
- Peak Size Problems

3

- Extra Or Ghost Peaks (Carryover)
- **Common Problems with Fid**
- **Common Problems with ECD**
- **Common Problems with TCD**
- **Common Problems with FPD**
- **Common Problems with MS**
- **Causes And Prevention of Column Damage**
- **Column Contamination**
- **Common Problems with Injectors**
- **Needle Discrimination**
- **Measurements Deviation**
- **Overlapping Peaks**

Day 5

- **Calibration Methods and Data Troubleshooting**
- **Calibration And Quantitative Methods**
- **Errors In Classical Analysis**
- **Detection Limit**
- **Confidence Limits**
- **Outliers Test**
- **Experimental Design and Optimization**

NOTE:
Pre & Post Tests will be conducted.
Case Studies, Group Exercises, Group Discussions, Last Day Review &Assessments will be carried out.

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