

Training Title

Gas Chromatography (GC) Operation, Calibration, Troubleshooting and Practice Maintenance

Training Duration

5 days

Training Venue and Dates

Gas Chromatography (GC) Operation, Calibration, Troubleshooting and Practice Maintenance	5	21-25 February	\$3,300	Abu Dhabi
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In any of the 5 star hotel. The exact venue will be informed later.

Training Fees

- 3300 US\$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch

Training Certificate

Define Management Consultants Certificate of course completion will be issued to all attendees.

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.

COURSE 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 includes also 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.

COURSE OBJECTIVES

1. The aim is to provide first hand information to the participants on optimal use of Gas chromatography (GC).
2. A special emphasis on applications, maintenance and troubleshooting.
3. Imparting participants the fundamental technique knowledge of Gas Chromatography.
4. To understand GC maintenance methods as a routine checks.
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.

COURSE OUTLINE

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

SPLITLESS INLET SYSTEM

COOL ON-COLUMN INLET

**PROGRAMMED TEMPERATURE VAPORIZATION INLET
COLUMN CONFIGURATION
DETECTOR TYPES AND CONFIGURATION**

**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**

**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
LOSS OF RESOLUTION
RETENTION CHANGES**

PEAK SIZE PROBLEMS
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

CALIBRATION METHODS AND DATA TROUBLESHOOTING
CALIBRATION AND QUANTITATIVE METHODS
ERRORS IN CLASSICAL ANALYSIS
DETECTION LIMIT
CONFIDENCE LIMITS
OUTLIERS TEST
EXPERIMENTAL DESIGN AND OPTIMIZATION

Practical quantitative training by Excel and Software program

Practical qualitative training by MS-Software

Video clip of GC device Maintenance is available in the course

Exercises and discussion will be conducted at the end of the course

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