

**Training Title**

**MODERN CHEMICAL LABORATORY: Analytical Instrumentation, Equipment Calibration, Quality & Safety**

**Training Duration**

5 days

**Training Dates & Venue**

REF	Modern Chemical Laboratory: Analytical Instrumentation, Equipment Calibration, Quality & Safety		14-18 April 2025	\$5,500	Dubai, UAE
LM025		5			

Training will be held at any of the 4 or 5-star hotels. The exact venue will be informed once finalized.

**Training Fees**

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

**Training Certificate**

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

**TRAINING OVERVIEW**

**TRAINING DESCRIPTION**

Knowledge of modern analytical instruments and techniques is necessary to solve any laboratory problem. The course provides basic analytical analysis methods and troubleshooting techniques of the most used instruments in an analytical laboratory. In addition, it offers elegant tools for qualitative and quantitative data techniques with practice work on analysis software. The aim is to enrich and advance the skills and knowledge of participants to understand analytical chemistry technology.

**TRAINING OBJECTIVES**

- To impart participants fundamental techniques of analytical chemistry.
- To identify the application of analytical methods.
- To understand the instruments' techniques.
- To know how to judge the accuracy and precision of experimental data and how these judgments can be sharpened by the application of statistical methods.
- To understand the tools and techniques used to achieve process analysis, qualitative methods, cause and effect diagrams and calibration graphs.
- To be familiar with the latest analytical methods.

**WHO SHOULD ATTEND?**

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

*DMCT/OL/9/18(Rev3Dt:23/9/18)*

## 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 motivate everybody find the right answers. The delegates will also be encouraged to raise their own questions and to share in the development of the right answers using their own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

## DAILY OUTLINE

1. Introduction to analytical technique
2. Methods of analysis
3. Basic laboratory technique: sample preparation, analytical measurement, fundamental concepts, chemical equation, acidity of solution, buffers
4. Gravimetric methods of analysis
5. Preparation of chemicals
6. Acid-base titration methods
7. Complex-formation titration methods
8. Oxidation-reduction titration
9. Precipitation titration methods
10. Reference/indicator electrodes
11. Potentiometric coulometric
12. Potential selectivity of electrolytic methods
13. Manipulation methods: solid phase extraction and derivatization
14. Chromatography technique
15. Gas chromatography (inject system, column, detector types)
16. High performance liquid chromatography: mobile phase, pumping system, sample inject system, column, detector types
17. Other chromatography techniques
18. Data management software
19. Analytical retention process
20. Spectroscopy technique and molecules identifying
21. Infrared absorption spectroscopy
22. Nuclear magnetic resonance spectroscopy
23. Mass spectroscopy
24. UV/IR absorption spectroscopy
25. Raman spectroscopy
26. X-Ray spectroscopy
27. Electron spectroscopy
28. Atomic absorption
29. Instruments troubleshooting: column contamination, broad in the peak bandwidth, ghost peaks, system peak, contamination in the inlet filter, change solvent in mobile phase (HPLC), interferences in the AAS, detector contamination.
30. Safety Operation

DMCT/OL/9/18(Rev3Dt:23/9/18)

31. 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.

**Note:**

**Pre & Post Tests will be conducted**

**Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.**



[www.definettraining.com](http://www.definettraining.com)

DMCT/OL/9/18(Rev3Dt:23/9/18)

P.O BOX 45304  
ABU DHABI, U.A.E

T +971 2 6264455  
F +971 2 6275344

[www.definettraining.com](http://www.definettraining.com)