

Laboratory Equipment Technical and Maintenance

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Energy Milestones Corporation Advancing Professionals to the next level

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Laboratory Equipment Technical and Maintenance

Overview

This workshop is intended to provide analytical chemists and their colleagues in related sciences with concise and convenient summaries of the fundamental data and the practical procedures that are most important and useful among the instrumental methods in analytical chemistry, and to be able to quantify the performance of analytical instruments, in particular concerning the following:

- Estimating uncertainties in the instrument
- Quantifying and demonstrating performance quality

With an appreciation of the limitations imposed by instrument design, leading to the interplay of the validation and qualification processes within quality assurance systems. This workshop includes a unique framework of topics that covers the primary instrumental techniques of spectrophotometers, chromatography, capillary electrophoresis, and atomic emission spectroscopy. The use of case studies, exercises and practical applications will help participants to develop a thorough understanding of the various concepts that underpin the different techniques.

Course Objectives

At the end of this course, the participants will be able to:

- To understand the various techniques of analytical measurements
- To give the principles of reliable laboratory measurements
- To outline key laboratory safety issues and safety measures
- To estimate uncertainties in the instrument
- To be aware of the Instrument Performance Characteristics, which include types and interactions between different characteristics.
- To prepare and handle samples for different Analytical instrumentation
- To understand, use, maintain and troubleshoot key laboratory equipment (Ultraviolet, Visible Spectrophotometers, Infrared Spectroscopy, Electrolytic Conductance and pH, Gas Chromatography)

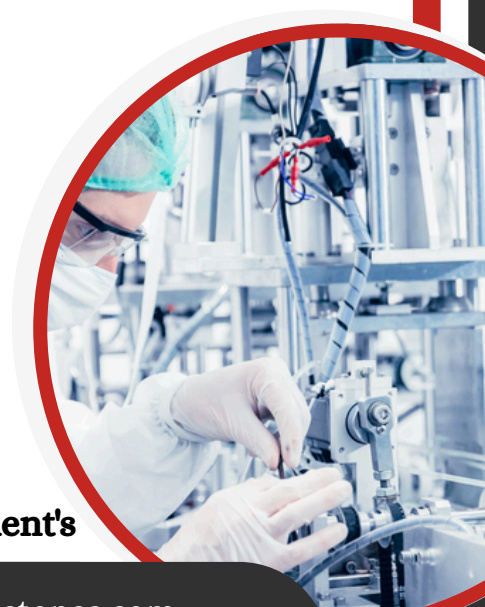


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Course Content

- The laboratory and its purpose
- The laboratory environment
- Laboratory layout and construction
- Out-of-laboratory services, Electricity, ventilation, water, drains, etc.
- Benches, hoods, sink
- Glassware
- Plastic ware
- Techniques of Analytical Measurements
- Instrumental Chemistry
- Principles of instrumental chemistry
- Balances
- Titration
- Colorimetry
- Atomic absorption
- Chromatography
- Petroleum Laboratory equipment
- Calibration
- Correlations
- Reference materials
- Correct laboratory techniques
- Statistical principles for Laboratory measurements
- Reporting of analytical results
- Why is safety important?
- Safety Policy
- Laboratory Safety
- Handling of toxic and hazardous materials
- Spills and spill control
- Good laboratory practice
- Material safety data sheets
- Emergency planning
- Handling of Compressed Gases (Cylinders)
- Destruction of dangerous chemicals in the laboratory
- Maintenance and troubleshooting of key laboratory equipment's

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Targeted Audience

This course is designed for all professionals in chemical laboratories, including laboratory managers, superintendents, supervisors, engineers, chemists, analysts, technicians, and laboratory maintenance staff.

Course Methodology

Facilitated by an experienced professional trainer, this training course will be conducted as a highly interactive workshop session. A variety of training methodologies and facilitation techniques will be employed before and during the course, as applicable. These methods are aimed at enhancing individual and group interaction while maximising learning. Some of these methods are:

- Online Pre-post Test
- Colourful Visual Aids
- Gamification
- Self-Assessment Instruments
- Simulations
- Case Studies
- Videos
- Group Exercises & Discussions
- Role plays
- Indoor & Outdoor games

