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Course Name

Inductively Coupled Plasma Mass Spectrometry (ICP-MS) Basic User Level

Sector Name
Oil, Gas and Chemical

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Inductively Coupled Plasma Mass Spectrometry (ICP-MS) Basic User Level

Course Introduction

This course provides an introduction to the principles and applications of Inductively Coupled Plasma Mass Spectrometry (ICP-MS). Participants will learn about the operation of ICP-MS instruments, sample preparation techniques, and data analysis methods. The training is designed for beginners who are new to ICP-MS and seeks to equip them with the foundational skills needed to operate the equipment effectively and interpret results.

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Target Audience

✓ Laboratory technicians and analysts

✓ Environmental scientists

✓ Quality control professionals

✓ Students and researchers in analytical chemistry

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Learning Objectives

- ✓ Understand the fundamental principles of ICP-MS and its components.
- ✓ Prepare samples and operate the ICP-MS instrument safely and effectively.
- ✓ Analyze and interpret data obtained from ICP-MS.
- ✓ Recognize common challenges and troubleshooting techniques in ICP-MS analysis.

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Course Outline

✓ 01 Day One

Introduction to ICP-MS and Instrumentation

Session 1: Fundamentals of Mass Spectrometry

- ✓ Basic principles of mass spectrometry.
- ✓ Overview of the mass spectrometer components.

Session 2: Introduction to Inductively Coupled Plasma (ICP)

- ✓ Principles of plasma generation and characteristics.
- ✓ Advantages of ICP as an ion source.

Session 3: Overview of ICP-MS Instrumentation

- ✓ Key components of an ICP-MS system: nebulizer, plasma torch, and mass analyser.
- ✓ Discussion of different types of ICP-MS configurations (quadrupole, time-of-flight).

Session 4: Sample Preparation Techniques

- ✓ Importance of sample preparation for ICP-MS analysis.

✓ Overview of sample digestion, dilution, and stabilization methods.

Session 5: Safety and Operational Procedures

✓ Laboratory safety protocols when using ICP-MS.

✓ Best practices for instrument operation and maintenance

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Course Outline

✓ 02 Day Two

Operating ICP-MS and Data Acquisition

Session 1: Setting Up the ICP-MS

✓ Step-by-step guide on instrument setup and calibration.
✓ Understanding the role of internal standards and calibration curves.

Session 2: Sample Introduction and Analysis

✓ Techniques for introducing samples into the ICP-MS.
✓ Understanding the impact of the sample matrix on analysis.

Session 3: Data Acquisition and Instrument Control

✓ Overview of data acquisition software and interfaces.
✓ Monitoring instrument performance and stability.

Session 4: Basic Troubleshooting and Maintenance

✓ Common issues encountered in ICP-MS operation and how to address them.
✓ Routine maintenance procedures to ensure optimal performance.

Session 5: Hands-On Practice

- ✓ Participants will operate the ICP-MS instrument.
- ✓ Sample analysis and data acquisition exercises.

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Course Outline

✓ 03 Day Three

Data Interpretation and Applications

Session 1: Data Analysis and Interpretation

- ✓ Techniques for processing and interpreting ICP-MS data.
- ✓ Understanding results and reporting formats.

Session 2: Quality Control in ICP-MS

- ✓ Importance of quality control measures in ICP-MS analysis.
- ✓ Implementing quality assurance protocols and procedures.

Session 3: Applications of ICP-MS

- ✓ Overview of applications in environmental, pharmaceutical, and materials analysis.
- ✓ Case studies demonstrating the versatility of ICP-MS.

Session 4: Advanced Topics in ICP-MS

- ✓ Introduction to isotopic analysis and mass spectrometry advancements.
- ✓ Discussion on emerging trends and technologies in ICP-MS.

Session 5: Final Assessment and Course Wrap-Up

- ✓ Assessment of participants' understanding through a quiz or group discussion.
- ✓ Discussion on the future applications of ICP-MS and participant feedback.

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Feb. 1, 2027	Feb. 3, 2027	3 days	2250.00 $	UAE , Dubai
June 7, 2026	June 9, 2026	3 days	3250.00 $	KSA , Riyadh
Sept. 14, 2026	Sept. 16, 2026	3 days	3250.00 $	UAE , Dubai
Nov. 30, 2026	Dec. 2, 2026	3 days	4950.00 $	Netherlands , Amsterdam

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