MAWA EVENTS

Address: No. 857, Block A2. Leisure Commerce Square - No 9., 46150 Petaling Jaya, Selangor, Malaysia

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INDUCTIVELY COUPLED PLASMA (ICP) APPLICATION AND ANALYSIS

"Advanced ICP Techniques for Precise Elemental Analysis and Laboratory Excellence"

Schedule

Date	Venue	Fees (Face-to-Face)
01 – 05 November 2026	Doha, Qatar	USD 3,495 per delegate

► **Available delivery methods:** Face-to-Face & Online Training

Introduction

Inductively Coupled Plasma (ICP) technology is a powerful tool for multi-elemental analysis across a wide range of industries, including environmental monitoring, pharmaceuticals, petrochemicals, and food analysis. Its accuracy, sensitivity, and versatility make ICP an essential analytical technique in modern laboratories.

This intensive 5-day training program provides participants with advanced theoretical knowledge and hands-on experience in ICP operation, method development, optimization, and troubleshooting. Participants will learn best practices for sample preparation, data interpretation, and instrument maintenance to ensure high-quality analytical results.

Objectives

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

- Understand ICP principles, instrumentation, and detection technologies
- Develop and optimize ICP methods for accurate elemental analysis
- Perform calibration, standardization, and quality control procedures
- Troubleshoot common ICP operational issues effectively
- Apply ICP analysis across various sample matrices
- Maintain instruments to maximize reliability and performance
- Interpret analytical results for regulatory and research purposes

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Why Attend

- Gain comprehensive knowledge of ICP operation and applications
- Improve accuracy and reliability of multi-element analysis
- Learn advanced troubleshooting techniques to minimize downtime
- Enhance laboratory efficiency and performance
- Build confidence in method development, calibration, and data interpretation

Target Audience

This program is designed for:

- Analytical chemists and laboratory scientists
- Quality control and R&D professionals
- Environmental, pharmaceutical, and food industry laboratory personnel
- Instrumentation engineers and maintenance technicians
- HSE professionals involved in analytical monitoring
- Professionals seeking advanced ICP analytical skills

Individual Benefits

Key competencies that will be developed include:

- Mastery of ICP theory and instrumentation
- Method development, calibration, and optimization skills
- Advanced troubleshooting and preventive maintenance expertise
- Accurate data interpretation and reporting skills
- Confidence in handling diverse sample matrices
- Enhanced problem-solving in analytical laboratory operations

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Improved laboratory accuracy, efficiency, and reliability
- Reduced instrument downtime and operational errors
- Enhanced compliance with analytical and regulatory standards
- Optimized workflow and resource utilization
- Strengthened laboratory capability for high-precision elemental analysis

Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings – In-depth exploration of ICP principles, components, and analytical applications
- Case Studies – Real-world examples of ICP method development and troubleshooting
- Workshops – Hands-on exercises in sample preparation, calibration, and data interpretation
- Peer Exchange – Group discussions on common laboratory challenges and solutions
- Tools – Practical guides, troubleshooting checklists, and instrument maintenance templates

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Course Outline

Detailed 5-Day Course Outline

Training Hours: 07:30 AM – 03:30 PM Daily Format: 3–4 Learning Modules Coffee Breaks: 09:30 & 11:15 Lunch Buffet: 01:00 – 02:00

Day 1: Introduction to ICP and Instrumentation

Module 1: Principles of ICP (07:30 – 09:30)

- Fundamental theory of ICP
- Plasma generation and excitation mechanisms
- Applications across industries

Module 2: ICP Instrument Components (09:45 – 11:15)

- Torch, nebulizer, detector, and interface design
- Sample introduction and flow dynamics

Module 3: Sample Preparation Techniques (11:30 – 01:00)

- Acid digestion, dilution, and matrix considerations

Module 4: Workshop & Practical Demonstration (02:00 – 03:30)

- Instrument setup and safety protocols

Day 2: Method Development and Calibration

Module 1: ICP Method Development (07:30 – 09:30)

- Selecting wavelengths and isotopes
- Optimizing plasma and nebulizer conditions

Module 2: Calibration and Standardization (09:45 – 11:15)

- Internal and external standards
- Curve fitting, LOD/LOQ calculations

Module 3: Quality Control Techniques (11:30 – 01:00)

- Performance validation and reproducibility checks

Module 4: Hands-on Workshop (02:00 – 03:30)

- Calibration and method optimization exercises

Day 3: Troubleshooting ICP Systems

Module 1: Common Operational Issues (07:30 – 09:30)

- Signal drift, background interference, and noise
- Flame and torch instability

Module 2: Diagnostic Techniques (09:45 – 11:15)

- Flow, temperature, and plasma monitoring
- Identifying and solving sample introduction problems

Module 3: Practical Troubleshooting Session (11:30 – 01:00)

- Simulation of typical ICP issues and corrective actions

Module 4: Peer Discussion (02:00 – 03:30)

- Sharing lessons learned from real laboratory challenges

Day 4: Advanced ICP Techniques and Applications

Module 1: Multi-Elemental Analysis (07:30 – 09:30)

- Simultaneous detection and quantification
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Interference correction strategies

Module 2: Specialized Sample Matrices (09:45 – 11:15)

- Environmental, pharmaceutical, and food samples
- Handling complex matrices

Module 3: Instrument Performance Optimization (11:30 – 01:00)

- Maintenance schedules and troubleshooting prevention

Module 4: Hands-on Practice (02:00 – 03:30)

- Advanced method execution and result validation

Day 5: Data Interpretation, Quality Assurance, and Review

Module 1: Chromatographic Data Analysis (07:30 – 09:30)

- Peak identification, quantification, and reporting

Module 2: Quality Assurance and Compliance (09:45 – 11:15)

- SOPs, regulatory standards, and documentation

Module 3: Workshop & Case Studies (11:30 – 01:00)

- Real-life applications and problem-solving exercises

Module 4: Final Review & Action Plan (02:00 – 03:30)

- Individual learning assessment and laboratory implementation strategies

Certification

Participants will receive a Certificate of Completion in Inductively Coupled Plasma (ICP) Application and Analysis, validating their advanced skills, practical expertise, and ability to perform accurate ICP analysis and troubleshooting in professional laboratory environments.

Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
- **Industry-Leading Faculty:** Courses delivered by seasoned professionals with hands-on experience.
- **Practical Insights:** Learn to turn theory into actionable strategies for real-world business impact.
- **Client-Focused Solutions:** Customized programs designed to achieve your organisation’s unique goals.

In-House / Customized Training Interested in running this course for your team? Please contact us:	TEL: **+601116373203**	EMAIL: **info@mawaevents.net**