Industrial Chemical Analysis Techniques Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Industrial Chemical Analysis Techniques Training Course is designed to equip learners with advanced skills in analytical chemistry, industrial quality control, laboratory instrumentation, and process monitoring systems. This course focuses on modern chemical analysis methodologies, precision testing, data-driven quality assurance, and regulatory compliance frameworks used across petroleum, pharmaceuticals, food processing, mining, water treatment, and manufacturing industries. Participants gain practical exposure to spectroscopy, chromatography, titration methods, electrochemical analysis, and advanced instrumentation calibration techniques, enabling them to deliver accurate, reliable, and reproducible results in industrial environments.

In today’s rapidly evolving industrial ecosystem driven by Industry 4.0, AI-powered analytics, and automated laboratory systems, chemical analysis plays a critical role in ensuring product safety, process optimization, and environmental compliance. This training integrates theoretical foundations with real-world industrial applications, focusing on ISO standards, GMP compliance, laboratory best practices, and digital lab management systems (LIMS). Learners will develop problem-solving capabilities in contaminant detection, material characterization, process validation, and chemical quality auditing, making them highly valuable in global chemical and manufacturing industries.

Programme Curriculum

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5 days

Course Objectives

1. Master industrial chemical analysis techniques and laboratory best practices
2. Understand spectroscopy and chromatography applications in quality control
3. Apply GC-MS, HPLC, UV-Vis, and FTIR instrumentation techniques
4. Develop skills in industrial process monitoring and chemical diagnostics
5. Ensure compliance with ISO 17025 laboratory accreditation standards
6. Perform accurate chemical composition and material characterization analysis
7. Implement quality assurance (QA) and quality control (QC) systems
8. Enhance competency in data interpretation and analytical reporting tools
9. Understand Good Manufacturing Practices (GMP) in chemical industries
10. Utilize automated laboratory systems and LIMS software integration
11. Conduct environmental chemical testing and pollution analysis
12. Improve skills in error reduction and precision measurement techniques
13. Apply predictive analytics in industrial chemical processes

Target Audience

1. Chemical Engineers and Industrial Chemists
2. Laboratory Technicians and Analysts
3. Quality Control (QC) and Quality Assurance (QA) Professionals
4. Pharmaceutical Industry Staff
5. Petroleum and Petrochemical Engineers
6. Environmental Scientists and Inspectors
7. Food and Beverage Quality Specialists
8. Graduates in Chemistry, Biochemistry, and Applied Sciences

Course Modules

Module 1: Fundamentals of Industrial Chemical Analysis

- Principles of chemical analysis and measurement accuracy
- Types of analytical techniques used in industries
- Introduction to laboratory safety and compliance

- Instrumentation overview and calibration basics
- **Case Study:** Failure analysis in a pharmaceutical lab due to contamination errors

Module 2: Spectroscopy Techniques

- UV-Visible spectroscopy principles and applications
- Infrared (FTIR) spectroscopy for material identification
- Atomic absorption spectroscopy (AAS) fundamentals
- Data interpretation and spectral analysis
- **Case Study:** Detection of adulterants in food products using spectroscopy

Module 3: Chromatography Techniques

- Gas Chromatography (GC) applications in petrochemical analysis
- High Performance Liquid Chromatography (HPLC) systems
- Thin Layer Chromatography (TLC) methods
- Sample preparation and separation techniques
- **Case Study:** Drug purity analysis in pharmaceutical manufacturing

Module 4: Electrochemical Analysis

- pH measurement and ion-selective electrodes
- Potentiometry and conductometry applications
- Redox reactions in industrial testing
- Sensor-based chemical detection systems
- **Case Study:** Water quality monitoring in industrial wastewater treatment

Module 5: Industrial Quality Control (QC) Systems

- Quality assurance frameworks and QC protocols
- Statistical quality control methods
- Standard operating procedures (SOPs)
- Defect detection and process improvement
- **Case Study:** Production line defect analysis in a chemical plant

Module 6: Instrument Calibration and Maintenance

- Calibration standards and traceability systems
- Maintenance of analytical instruments
- Error reduction and uncertainty measurement
- Preventive maintenance schedules
- **Case Study:** Downtime reduction in a petrochemical lab through predictive maintenance

Module 7: Environmental and Material Analysis

- Soil, air, and water chemical testing methods
- Toxicity and contamination detection techniques
- Material characterization and polymer testing
- Environmental compliance regulations
- **Case Study:** Heavy metal contamination detection in industrial effluents

Module 8: Advanced Data Analysis & Laboratory Informatics

- Laboratory Information Management Systems (LIMS)
- Data analytics in chemical testing
- AI and automation in laboratory workflows
- Reporting and documentation standards
- **Case Study:** AI-based predictive quality failure detection in manufacturing

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price

23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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