CSIR Integrated Skill Initiative

CSIR-CIMAP

FIVE DAYS SKILL DEVELOPMENT

HANDS-ON TRAINING:

CONTAMINANT ANALYSIS IN PLANT, SOIL, AND ENVIRONMENTAL SAMPLES

(16 November - 20 November 2026)

CONTACT US

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TECHNIQUES TO BE COVERED

01 • **ICP-OES (Inductively Coupled Plasma)**
- Principles & Instrumentation
- Microwave digestion
- Detection of trace metals in the sample

02 • **Gas Chromatography (GC-HS, FID, NPD, and µECD)**
- Instrumentation and sample injection techniques
- Pesticide extraction (QuEChERS method)
- Interpretation of chromatograms

03 • **IC (Ion Chromatography)**
- Analysis of anions and cations
- Instrument operation
- Method development and sample preparation

04 • **HPLC (High-Performance Liquid Chromatography)**
- Method development
- Column selection, mobile phase preparation
- Sample preparation and result interpretation

05 • **SEM (Scanning Electron Microscopy)**
- Surface imaging and microstructural analysis
- Applications

06 • **Thermogravimetric Analysis (TGA)**
- Principles & Instrumentation
- Sample Preparation and Handling
- Analysis of thermal stability and composition

07 • **Differential Scanning Calorimetry (DSC)**
- Analysis of melting point, crystallization, and glass transition
- Instrument operation and thermal program setup
- Interpretation of heat flow curves

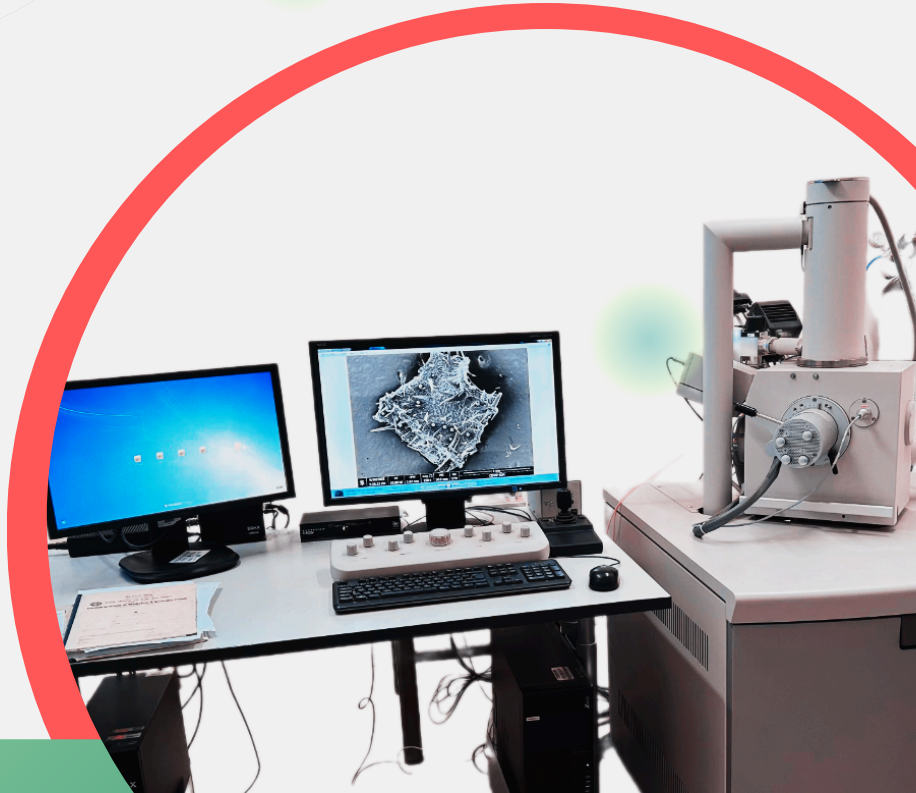
08 • **FTIR (Fourier-Transform Infrared Spectroscopy)**
- Basics of IR spectroscopy
- Application in organic/inorganic compound identification

09 • **Total Organic Carbon (TOC)**

10 • **CHN Analyzer**

11 • **Chlorophyll Fluorescence Meter**

12 • **Leaf Area Meter and Sampling Methods of soil and plant**



TRANING PROGRAM

A comprehensive hands-on training designed for participants with practical skills in the analysis of contaminants in plant, soil, and environmental samples using advanced analytical instrumentation. Techniques such as ICP, IC, HPLC, GC, SEM, FTIR, TGA, and DSC will be demonstrated to analyze trace metals, pesticide residues, and other contaminants. Participants will gain both theoretical knowledge and laboratory experience in method development, sample collection(soil and plant), preparation, and data interpretation.

GET THE AUTHENTIC RESULTS

This intensive training is designed to enhance participant capabilities in identifying and quantifying contaminants in diverse environmental matrices. Emphasis will be placed on accurate sampling, validated analytical workflows, and integration of multiple instrumental techniques to ensure reliable, reproducible data. By the end of the program, participants will be confident and strengthening their contribution to research, environmental safety, and quality assurance programs.

EXPECTED OUTCOMES

- Better understanding of the principles and operation of instruments used in contaminant analysis.
- Perform accurate sample preparation and analysis using techniques like GC-μECD ICP and TGA.
- Interpret analytical results from HPLC, GC-μECD, FTIR, and DSC systems.
- Apply the QuEChERS method for rapid and effective extraction of pesticides and contaminants from complex samples.
- Apply knowledge of instrumental methods in research, quality control, and regulatory environments.
- Implement preventive maintenance and troubleshooting practices.

MORE ABOUT TRANING PROGRAM

- **Duration:** 05 Days (Residential)
- **Batch Size:** 15 participants (First come, first served)
- **Mode of Registration:** Fill the form available at www.cimap.res.in and submit with payment
- **Registration Fee:** Students(B.Sc. and above): ₹8,000/-, Industry/Institution Sponsored: ₹12,000/-
- **Payment Details:**
  In favor of "Director, CSIR-CIMAP, Lucknow"
  Bank Name: State Bank of India, Main Branch, Hazratganj, Lucknow
  Account No.: 30267691783
  IFSC Code: SBIN0000125
  MICR Code: 226002002
  Branch Code: 000125
  Note: No refund under any circumstance. Selected candidates will be notified by email/phone.
- **Accommodation:** Provided at guest house on twin-sharing basis
- Timings: 9:30 AM to 6:00 PM