

Modern Instrumental Methods of Analysis - Video course

COURSE OUTLINE

This course is designed to familiarize the students with various instrumental methods of chemical analysis that scientists and engineers come across during their course work and research undertakings.

The participants are introduced to the principles of chemical analysis, matrix effects, detailed instrumentation, operation and interpretation of data, error analysis and statistical methods of data handling.

At the end of the course the student would be able to handle the analysis of mg, ppm and ppb levels of analyte by appropriate instrumental methods.

Applications: Chemical analysis of hazardous materials, environmental samples, inorganic, organic and biomaterials at trace and ultra trace quantities.

COURSE DETAIL

S.No	Topics	No. of Hours
1	Introduction to spectroscopic techniques.	2
2	UV - Vis Spectrophotometry, Nephelometry, Turbidimetry, Reflectance Spectrometry, Fluorescence, Phosphorescence Spectrometry.	8
3	Flame Emission and Atomic Absorption Spectrometry, Electrothermal AAS, Hydride generation AAS and Flameless mercury analysis.	8
4	Inductively Coupled Plasma Atomic Emission Analysis.	2
5	Infrared spectrometry.	3
6	Introduction to X-Ray techniques, XRF.	3
7	Introduction to NMR spectroscopy and mass spectrometry.	3
8	Electroanalytical techniques: Potentiometry, Voltametry, Polarography.	6
9	Chromatographic analysis: GC, LC, HPLC, Hyphenated techniques.	6



NP-TEL

NPTEL

<http://nptel.iitm.ac.in>

Chemical Engineering

Pre-requisites:

1. Engineering degree in chemical, material science, metallurgy, civil and allied fields.
2. Post graduate degree in chemistry, botany, zoology, material science etc.

Coordinators:

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10	Errors, statistical methods of data handling.	2
	Total	43

References:

1. H. Willard, L.L. Meritt, J.A. Dean and F.A. Settle : Instrumental Methods of Analysis, 6th Edition, CBS.
2. A.I. Vogel: Quantitative Inorganic Analysis, 5th Edition, ELBS.
3. G.W. Ewing: Analytical Instrumentation Hand book, Marcell Dekker, New York, 1990.