



**CHEMICAL
ENGINEERING**

Trace and ultra-trace analysis of metals using atomic absorption spectrometry

Type of Course	: New
Course Snapshot	: Core / UG
	: Applies to all
Pre-requisites	: Differential calculus and integration
Course Duration	: 20 hours / 8 weeks

COURSE OUTLINE:

Introduction to pollution control monitoring, Introduction to Atomic Absorption Spectroscopy, Theoretical Principles of Atomic Absorption and emission phenomenon, Instrumentation, Optical benchmarking, flame and flame emission, absorption and flameless ETAAS, hydride generation, Cold vapor mercury analysis, Practice of Spectrophotometry, Applications of Absorption Spectrometry to pollution monitoring, Ambient Air Monitoring, Industrial Effluents and Metal Ions, Continuous Monitoring and Bio Chemical Analysis.

INSTRUCTOR:

Prof. J R Mudakavi
Department of Chemical engineering
IISc Bangalore



ABOUT INSTRUCTOR:

Dr J R Mudakavi is a former faculty of Chemical engineering Dept, Indian Institute of Science, Bangalore. He has taught "Modern Instrumental Methods of analysis and Pollution Control" for 36 years. He is an authority on analytical instrumentation. He is the author of 2 books on Air Pollution and Hazardous Waste management. He has published more than 100 papers in National and International Journals, conferences, Symposia etc. He is a member of several expert committees such as CSIR DST MOEF KSPCB etc. He has offered two courses on instrumentation in NPTEL. He is a popular, Science writer and lecturer and environmentalist.

COURSE PLAN:

- Week 1 : Introduction to pollution control monitoring and Introduction to atomic structure
- Week 2 : Interaction of electromagnetic radiation with fundamental particles
- Week 3 : Instrumentation, for flame, flameless and graphite furnace AAS
- Week 4 : Mechanism of Atomization
- Week 5 : Design of atomizers, flame, graphite , hydride generation and Instrumentation of AAS & AES electronics and optics
- Week 6 : Techniques of flame AAS, Interferences in flame and non flame AAS
- Week 7 : Interferences in Hydride generation AAS and cold vapor mercury, Applications of AAS to individual elements.
- Week 8 : Applications of AAS to individual elements continued, pollution monitoring and environmental sampling and conclusion.