



# ANALYTICAL CHEMISTRY

## PROF. DEBASHIS RAY

Department of Chemistry  
IIT Kharagpur

**INTENDED AUDIENCE** : B. Tech.B. E.M. Sc.B. Engg.

**PRE-REQUISITES** : H. S. +2 Level

**INDUSTRIES APPLICABLE TO** : Hindustan Lever Ltd, Ranbaxy, Shell, ONGC, NTPC, SAIL, CIL, Waters, PHE Dept.

## COURSE OUTLINE :

It will give the opportunity to study and use specialized instruments and specific methods to separate, identify, and quantify the unknown substance. Spectroscopic technique will consist of applications of atomic absorption spectroscopy, atomic emission spectroscopy, ultraviolet-visible spectroscopy, X-ray fluorescence spectroscopy, infrared spectroscopy, Raman spectroscopy and Mössbauer spectroscopy. In electrochemical methods cyclic voltammetry, coulometry and amperometry will be discussed. The course has applications that include forensic science, analysis of biological samples, clinical analysis, environmental analysis, and materials analysis.

## ABOUT INSTRUCTOR :

Prof. Debashis Ray is an M. Sc. (Gold Medalist) from Burdwan University in 1985 and did his Ph. D. from IACS (degree from Jadavpur University) in 1989 and in faculty roll of IIT Kharagpur from 1990. Specialization: Inorganic Chemistry, Coordination Chemistry, Bioinorganic Chemistry, Analytical Chemistry. Received INSA YS Medal in 1994 and CRSI Bronze Medal in 2007. PHE Dept.

## COURSE PLAN :

- Week 01** : Chemicals and Materials Analysis Methods
- Week 02** : Role of Analytical Chemistry and Techniques
- Week 03** : Chemical Equilibria and Basis of Chemical Analysis
- Week 04** : Spectrochemical Methods - I
- Week 05** : Spectrochemical Methods - II
- Week 06** : Thermal Methods - I
- Week 07** : Thermal Methods - II
- Week 08** : Electroanalytical Methods - I
- Week 09** : Electroanalytical Methods - II
- Week 10** : Electrochemical Sensors
- Week 11** : Bioanalytical Chemistry
- Week 12** : Applications of Chemical Analysis