

Course Code	Course Title	Credit Hours
ENE-923	Advanced Analytical Techniques	3 (3+0)

### Course Description

This course provides in-depth knowledge of the principles, methods and devices used in instrumental analysis. Contemporary techniques and their applications in solving environmental problems are emphasized.

### Course Outline

**Introduction:** Classification of Analytical Methods, Types of Analytical Methods/Techniques, Selecting an Analytical Method/Technique.

**Spectroscopy:** Principles, Components of Optical Instruments, Molecular UV-visible & Near Infrared Absorption, Atomic Absorption & Emission Spectroscopy, X-ray Spectroscopy (X-ray Fluorescence methods, X-ray absorption methods, X-ray Diffraction Methods, Mass Spectrometry).

**Chromatography:** Principles, Gas Chromatography, High Performance Liquid Chromatography, Applications of GC & HPLC.

**Automated Methods of Analysis:** Overview of Automated Instrument & Automation.

### Recommended Books

1. Skoog, D. A., Holler, F. J. and Crouch, S. R. (2007). *Principles of Instrumental Analysis* (6<sup>th</sup> ed.). Thomson Brooks/Cole, Belmont, CA.