

APPLIED CHEMISTRY (BS-ADP 7th Semester)

Module Code:	Chem-433
Module title:	Analytical Techniques
Name of Scheme:	BS-ADP 7th Semester
Department:	School of Chemistry
Faculty:	Science
Module Type:	Compulsory
Module Rating:	2 credits

OBJECTIVES

Students will learn about the principle, theory and working of basic analytical techniques

SYLLABUS OUTLINE:

1. Chromatography

a. **Thin Layer Chromatography –**

Basic principle, theory and mechanism, stationary and mobile phase selection, locating reagents, applications, introduction to HPTLC

b. **High Performance Liquid Chromatography (HPLC) –**

Basic principle, types, theory and mechanism, stationary and mobile phase selection and types, basic parts of HPLC including pump, column, injector, detector, thermostat etc. Explanation of typical chromatogram highlighting retention time, peak height and width, tailing factor, resolution, theoretical plates, Isocratic and gradient elution and its significance, HPLC detectors such as Refractive Index, UV/Vis, photodiode array and fluorescence detector, Applications of HPLC

c. **Gas Chromatography Mass Spectrometry (GCMS) –**

Basic principle, theory and mechanism, stationary and mobile phase selection and types, basic parts of typical gas chromatography including sample injection port, gas reservoir, column and detectors. Nature of samples to be analyzed by GCMS, temperature selection, packed and capillary columns, Mass analyzers, quaderpole mass analyzers, Time of flight analyzer Applications of GCMS

2. Spectroscopy

Introduction, Basic Principle, Theory and Applications of Flame emission spectroscopy (FES), Flame atomic absorption spectroscopy (FAAS), continuous and line sources, construction of hollow cathode lamp, types of flames and their appropriate use, sensitivity and detection limits, Optical, Chemical, Physical and Ionization interferences and their possible solutions,

Introduction, Basic Principle, Theory and Applications of UV/Vis spectroscopy and Thermal Analysis Techniques.

RECOMMENDED BOOKS:

1. T. B. of Quantitative Inorganic Analysis, Vogel's Ed-4th, Longman Group Limited (1978).
2. Applied Chemistry, Haq Nawaz Bhatti and Muhammad Salman, 2017, Caravan Book Publisher, Pakistan.
3. Instrumental Analysis, Gary D. Christain, 1978, Introduction to Instrumental Analysis by Braun, McGraw-Hill Book company, 1987.
4. Instrumental Analysis by B.K. Sharma