Course Title: Analytical Techniques-II
Semester: VIII
Course Code: CH-413
Credit Hours: 3-0
Pre-requisite: Nil

Course Objectives

1. Students will acquire knowledge about theoretical aspects and instrumentation ofdifferent atomic spectroscopic methods as well as learn about the applications of these techniques in the field of chemical sciences.

2. Recommended Books

a. Christian, G. D., *Analytical Chemistry*, 6th ed., John-Wiley & Sons, New York,(2006).
b. Harris, D. C., *Quantitative Chemical Analysis*, 8th ed., W. H. Freeman andCompany, New York, (2011).
c. Kealey, D. and Haines, P. J., *BIOS Instant Notes in Analytical Chemistry*, BiosScientific Publishers Limited, Oxford, UK, (2002).
d. Skoog, D. A. and West., D. M., *Fundamentals of Analytical Chemistry*, 8th ed.,Hot Reinehart Inc., London, (2008).
e. Ebdon,L., Evaus, E.H, Fischer, A., and Hill, S.J., *An Introduction to AnalyticalAtomic Spectrometry*, John Wiley & Sons, England. (1998).
f. Bernhard Welz, Michael Sperling, *Atomic Absorption Spectrometry*, 3rd ed.,Wiley-VCH, Germany, (1998).
g. Farrukh, M. A., *Atomic Absorption Spectroscopy*, In Tech, (2012).

Detailed Contents

3. Flame Photometry. Origin and classification of atomic spectroscopic methods, origin of atomic spectrum, position of the signal, intensity of the signal, spectral line width, principle of flamephotometry, fate of the sample in the flame, flame and its characteristics, instrumentation for flame photometry, merits and limitations.

4. Atomic Fluorescence Spectrometry. Origin of atomic fluorescence, atomic fluorescence spectrum, types of atomic fluorescence transitions, principle of atomic fluorescence spectrometry, fluorescence intensity and analyte concentration, instrumentation for atomic fluorescence spectrometry, applications of atomic fluorescence spectrometry, interferences, merits and limitations.

5. Atomic Absorption Spectrophotometry. Principle of atomic absorption spectrophotometry, concentration dependence of absorption, quantitative methodology, instrumentation for atomic absorption spectrophotometry, radiation sources, atomizers, flames, graphite furnaces and electrochemical atomizers, monochromators, detectors, handling background absorption, interferencesin atomic absorption spectrophotometry, sample handling in atomic absorption spectrophotometry, preparation of the sample, use of organic solvents, microwave, digestion, sample introduction methods, applications of atomic absorption spectrophotometry.

6. Atomic Emission Spectrophotometry. Introduction,

principle of atomic emission spectrometry, atomic emission spectrometry using plasma sources, plasma and its characteristics, inductively coupled plasma, direct current plasma, microwave induced plasma, choice of argon asplasma gas, instrumentation for ICP-MS.

Course Outcomes

7. Students will acquire knowledge about the theoretical and instrumental aspects of flamephotometry, atomic fluorescence, atomic absorption, and atomic emission spectrophotometric methods.

Detail of Lab Work, workshop practice: Nil