CHEMISTRY
(Skill Development Course)
(2nd Semester)
Course No.:**CHM-SEC-151**
Basic Analytical Chemistry
Contact Hours: 60; Credits: 03
Full Marks = 100 [End Semester Exam (70) Internal Assessment (30)]
Pass Marks = 40 [End Semester Exam (28) Internal Assessment (12)]

Unit-1: Basic Concepts

Introduction to Analytical Chemistry and its interdisciplinary nature. Concept of sampling. Importance of accuracy, precision and sources of error in analytical measurements, significant figures. Chromatography: Definition, general introduction on principles of chromatography, paper chromatography, TLC, Developing reagent.

Unit-2: Analysis of Soil and Water

Analysis of soil: Composition of soil, Concept of pH and pH measurement, Complexometric titrations, Chelation, Chelating agents, use of indicators.
Analysis of water: Definition of pure water, sources responsible for contaminating water, water sampling methods, water purification method.

Unit-3: Analysis of Cosmetics

Definition of Cosmetics, historical background, classification. Major and minor constituents of cosmetics and their function. Analysis of deodorants and antiperspirants, Al, Zn, boric acid, chloride, sulphate. Determination of constituents of talcum powder: Magnesium oxide, Calcium oxide, Zinc oxide and Calcium carbonate by complexometric titration.

Unit-4: Analysis of Food

Analysis of food products: Nutritional value of foods, food preservations and adulteration. Identification of adulterants in some common food items like coffee powder, asafoetida, chilli powder, turmeric powder, coriander powder and pulses, etc. Analysis of preservatives and colouring matter.

Unit-5: Case Studies (Demonstration suggested)

Collection of water sample and determination of pH, acidity and alkalinity, dissolved oxygen (DO) of a water sample. Collection of soil sample from a study area, estimation of Calcium and Magnesium ions as Calcium carbonate by complexometric titration .Estimation of macro nutrients: Potassium, Calcium, Magnesium in soil samples by flame photometry.

Suggested Readings

- Willard, H.H., Merritt, L.L., Dean, J. & Settoe, F.A. Instrumental Methods of Analysis. 7th Ed. Wadsworth Publishing Co. Ltd., Belmont, California, USA, 1988.
- Skoog, D.A. Holler F.J. & Nieman, T.A. Principles of Instrumental Analysis, Cengage Learning India Ed.
- Harris, D. C. Quantitative Chemical Analysis, W. H. Freeman.

- Dean, J. A. Analytical Chemistry Notebook, McGraw Hill.
- Vogel, A. I. Vogel's Qualitative Inorganic Analysis 7th Ed., Prentice Hall.
- Vogel, A. I. Vogel's Quantitative Chemical Analysis 6 th Ed., Prentice Hall.
- Robinson, J.W. Undergraduate Instrumental Analysis 5 th Ed., Marcel Dekker, Inc., New York (1995).