

SEMESTER –I		
Code: 102104	Title : Analytical Chemistry	Credits : 4
Objectives:-		
<ol style="list-style-type: none"> 1. To describe the basic concept of analytical chemistry. Qualitative and quantitative analysis. 2. To use/apply the basic statistical treatment of the analytical data for getting a correct result. 3. Describe the different separation techniques such as distillation, Solvent and Solid Phase extraction. 4. Explain the basic of chromatography. 5. To ensure safety in laboratories. 6. To identify different types of environmental pollutants and their global impact. 7. To correlate various methods for control of environmental pollution. 		
Paper -I		60 Hours
Unit I	Basic concepts of analytical chemistry: - The role of analytical chemistry, qualitative and quantitative analysis, The analytical process, Validation of a method. Statistical treatment of analytical data: Introduction, types of errors, significant figures, precision and accuracy, methods of expressing accuracy, methods of expressing precision, the confidence limit, tests of significance- the F test, the student T test, rejection of results - the Q test. Statistics for small data sets, linear least squares, correlation coefficient, using spreadsheets for plotting calibration curves, slope, intercept and coefficient of determination, numericals.	15 Lectures
Unit II	Chromatography Introduction:- Basic principles and theory of chromatographic techniques, plate theory of chromatography, rate theory of chromatography, other factors in zone broadening, Development of the chromatogram - Frontal analysis, elution analysis displacement analysis, selection of chromatograph system, qualitative and quantitative analysis by chromatography.	15 Lectures
Unit III	Safety in Laboratories:- Basic concepts of Safety in Laboratories, Personal Protection Equipment (PPE), OSHA, Toxic Hazard (TH) classifications, Hazardous Chemical Processes (including process calorimetry / thermal build up concepts).	15 Lectures
Unit IV	Environmental Chemistry :- Air pollution, water pollution, Impact of pollution in India, Pollution, pollution in India, Greenhouse effect, Acid rain, Ozone depletion and their consequences on environment, Major air pollution disasters, Pollution control methods and techniques, Sampling and analysis of air and water pollution	15 Lectures

Reference Books :

1. Fundamental of Analytical Chemistry 8th Edn. Skoog , West Hollar, Couch.
2. Analytical Chemistry 6th Edition., Gary D. Christian

3. Chemical Separations and Measurements, D.G. Peters, J.M. Hayes and G.M. Hieftie
4. Instrumental Method of Chemical Analysis, G.R. Chatwal & S.K.Anand.
5. A.K. De, Environmental Chemistry, New Age International Publication, 5th Edition.
6. Wark K. & Werner C., Edited by David and Liptak,Air Pollution, CRC press LLC,3rd Edition.
7. S.P. Mahajan, Environmental Pollution Control in Process Industries, Tata McGraw Hill Publishing Co. Ltd.
8. B.K.Sharma & H. Kaur,Environmental Pollution, Krishna Prakashan Media Pvt Ltd.
9. R.K. Trivedi, P.K.Goyal, Introduction to Air pollution, ABD publisher.
10. P.K.Goyal, Water Pollution: Causes Effect and control, New Age International Publication.