CURRICULUM PLAN

Even Semester (2024-2025)

Name of the Teacher: Dr. Sajid Iqbal

Course: B.Sc. (H) Chemistry, Year- III, Semester- VI

Name of Paper and code: Analytical Methods in Chemistry (DSE 1), 3 Periods per Week

Contents	Allocation of Lectures	Month wise schedule to be followed	Tutorial/Assignment/ Presentation etc.
Unit 1: Qualitative and Quantitative Aspects of Analysis: Sampling, evaluation of analytical data, errors, accuracy and precision, methods of their expression. Normal law of distribution of indeterminate errors, statistical test of data; F, Q and t test, rejection of data, and confidence intervals.	5	1st week of January – 2nd week of January	-Syllabus Overview -Reference Books -Presentation on the topic assigned
Unit 2: Optical Methods of Analysis Origin of spectra, interaction of radiation with matter, fundamental laws of spectroscopy and selection rules. UV-Visible Spectrometry: Basic principles of instrumentation (choice of source, monochromator and detector) for single and double beam instrument; Transmittance. Absorbance and Beer-Lambert law Basic principles of quantitative analysis: estimation of metal ions from aqueous solution, geometrical isomers, keto-enol tautomers. Flame Atomic Absorption and Emission Spectrometry: Basic principles of instrumentation (choice of source, monochromator, detector, choice of flame and Burner designs). Techniques of atomization and sample introduction; Method of background correction, sources of chemical interferences and their method of removal, Techniques for the quantitative estimation of trace level of metal ions from water samples.	25	3rd week of January – 1st week of March	-Problem Discussion - Presentation -Class Test
Unit 3: Thermal methods of analysis Theory of thermogravimetry (TG) and basic principle of instrumentation of thermal analyser. Techniques for quantitative estimation of Ca and Mg from their mixture.	5	2nd week of March – 3rd week of March	-Assignment -Problem Discussion
Unit 4: Separation techniques Solvent extraction: Classification, principle and efficiency of the technique. Mechanism of extraction: extraction by solvation and chelation, Technique of extraction: batch, continuous and counter current extractions, Qualitative and quantitative aspects of solvent extraction: extraction of metal ions from aqueous solution, extraction of organic species from the aqueous and non-aqueous media. Chromatography: Classification, principle and efficiency of the technique, Mechanism of separation: adsorption, partition & ion-exchange	10	4th week of March - 1st week of May	-Presentation -Clearing Students doubts -Solving previous year questions