

CURRICULUM PLAN of Dr. Sajid Iqbal

Even Semester (2022-2023)

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

Name of Paper and code: Analytical Methods in Chemistry (DSE 1), UPC: 32177904

4 Periods per Week

Contents	Allocation of Lectures	Month wise schedule to be followed	Tutorial/Assignment/Presentation etc.
<p>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.</p> <p>Optical methods of analysis: Origin of spectra, interaction of radiation with matter, fundamental laws of spectroscopy and selection rules, validity of Beer-Lambert's law.</p> <p>UV-Visible Spectrometry: Basic principles of instrumentation (choice of source, monochromator and detector) for single and double beam instrument; Basic principles of quantitative analysis: estimation of metal ions from aqueous solution, geometrical isomers, keto-enol tautomers.</p>	18 Lectures	1 st Jan – 1 st Week of February	<ul style="list-style-type: none">• Syllabus Overview• Reference Books
<p>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.</p> <p>Thermal methods of analysis: Theory of thermogravimetry (TG), basic principle of instrumentation. Techniques for quantitative estimation of Ca and Mg from their mixture.</p>	12 Lectures	1 st Week of February- 3 rd week of February	<ul style="list-style-type: none">• Problem Discussion• Presentation on the topic assigned• Class Test
<p>Electroanalytical methods: Classification of electroanalytical methods, basic principle of pH metric, potentiometric and conductometric titrations. Techniques used for the determination of equivalence points. Techniques used for the determination of pK_a values.</p> <p>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.</p>	16 Lectures	3 rd week of February – 2 nd week of March	<ul style="list-style-type: none">• Assignment• Problem Discussion• Previous Year Paper Discussion
<p>Chromatography: Classification, principle and efficiency of the technique. Mechanism of separation: adsorption, partition & ion exchange. Development of chromatograms: frontal, elution and displacement methods.</p>	14 Lectures	4 th week of March- 4 th Week of April	<ul style="list-style-type: none">• Presentation• Clearing Students doubts• Solving previous year questions