Programme: M. Sc. Part-II (Analytical Chemistry)
Course Code: ACC-505
Title of the Course: Experiments in Analytical Chemistry
Number of Credits: 3 **Effective from AY:** 2019-20

Prerequisites for the course:	Should have studied the courses in Analytical Chemistry Practicals at MSc-I levels so as to have basic knowledge of quantitative analysis.	
Course Objectives:	1. Introduction of various experimental techniques for analysis. 2. Learning data analysis, handling and interpretation of spectra	
Course Outcomes:	1. Students should be in a position to use standardized material to determine an unknown concentration. 2. To gain experience with some statistics to analyse data in lab 3. Student should be in position to use different techniques for qualitative and quantitative estimation	
Content:	This course consists of 7 units of experiments in various areas of Analytical chemistry. Minimum 14 experiments shall be carried out and at-least 2 experiments from each unit. **UNIT 1: Analysis of Pharmaceutical Tablets/Samples** 1. Estimation of streptomycin in tablet sample by Maltol method 2. Estimation of Ibuprofen / Paracetamol 3. Estimation of sulphadiazine / sulphonamide 4. Determination of moisture content in tablet powder by Karl Fischer titration **UNIT 2: Planar and column Chromatography** 1. Separation of alpha amino acids by paper chromatography and to study effect of mobile phase on resolution. 2. Thin layer chromatography analysis of commercial available analgesic and to identify the active ingredients. 3. Purification and determination of amount of paracetamol from commercial tablet by column chromatography 4. Separation of a mixture of benzoin and benzil on silica gel column **UNIT 3: Ion exchange Chromatography and Solvent Extraction Method** 1. To determine the capacity of a cation exchange resin 2. To separate organic mixture (acidic+basic+Netral) by extraction 3. To separation and estimate the zinc and nickel ions using an anion exchange resin 4. To determine the Fe ion as Fe-oxine complex **UNIT 4: HPLC Analysis:** 1. HPLC analysis of benzaldehyde and benzyl alcohol using isocratic elution 2. To study HPLC method development by using linear and stepwise gradient elution for binary system 3.To analyze a mixture (benzene and toluene, anthracene and naphthalene) by Reverse phase-HPLC 4. HPLC analysis of Analgesics in a commercial sample/tablet, Ibuprofen to develop and validate the analytical method of any one drug using HPLC	

	UNIT 5: Gas Chromatographic Analysis: 1. Quantitative analysis of a mixture of chloroform and carbon tetrachloride 2. Gas chromatographic analysis for a mixture of gases like O_2, N_2 and CO_2 **UNIT 6: Spectrophotometry Method:** 1. To determine pk value of methyl red indicator at room temperature 2. To determine the stoichiometry and stability constant of ferric salicylic acid complex by Job's method and mole ratio method 3. To determine the amount of each caffein and benzoic acid from the soft drink by UV spectrophotometry. 4. To record UV absorption spectrum of acetone in n-hexane and in water to identify the various transition. **UNIT 7: Electrochemical Method:** 1. pH-metric determination of hydrolysis constant of aniline hydrochloride 2. pH-metric determination of the acid-base dissociation constant and isoelectric point of amino acid	
Pedagogy:	Prelab exercises/assignments/ presentations/ lab hand-out or a combination of some of these. Sessions shall be interactive in nature to enable peer group learning.	
Text Books/ References / Readings	1. J. H. Kennedy, *Analytical Chemistry Practice*, Saunders College Publishing, 1990, 2nd Ed. 2. G. D. Christian, *Analytical Chemistry*, John Willey and Sons, 1994,5th Ed. 3. *Vogel's Text book of Quantitative Inorganic Analysis*, Pearson Educatio n, Asia, 2000, 6th Ed. 4. A. J. Elias, *Collection of Interesting Chemistry Experiments*, University press, 2002. 5. A R West, *Solid State Chemistry and its Applications*,John Wiley & Sons , 1987. 6. R. A. Day, L. Underwood, *Quantitative Analysis*, prentice Hall, 2001, 6th Ed. 7. J. Kenkel, *Analytical Chemistry for technicians*, Lewis publishers, 2002, 3rd Ed.	