No	Information of the subject	
1	Unit name:	Analytical Chemistry
2	Code:	BioT31032
3	Classification:	Core subject
4	Credit value:	3
5	Semester/ Year Offered:	1/3
6	Pre-requisite:	BioT 21031 &BioT21032 Organic chemistry I &II
7	Mode of delivery:	Explain, Drawing, computer application, Practical, Quiz, Discussion
8	Assessment system and breakdown of marks:	Fill in the blanks, Multiple choice, short questions, short notes, practical
	Fill in the blanks, Multiple choice, short questions, Short notes	70%
	practical results, practical exam, Animation and viva test	30%
9	Academic staff teaching unit:	Department of Biotechnology
10	Course outcome of unit: After completion of this course, students will be able To analyze results data by standard deviation, chart and graph of standardization methods To analyze pH, Complexation and Solubility of acid-base reactions at equilibrium To apply Solvent Extraction, Solid Phase Extraction and different chromatography methods	
11	Synopsis of unit: Analytical chemistry subject is requirefor specialist and disciplined approach by their broad scope. The major areas of application are fundamental research Product,development product quality control,monitoring and control of pollutants,assay,medical and clinical studies. Scientific and commercial colleagues, customers and other interested parties, discuss together with on-site visits can greatly assist in the choice of method and the interpretation of analytical data thereby minimizing the expenditure of time, effort and money.From the chapters2**.**The Assessment of Analytical Data, 3. pH, Complexation and Solubility Equilibria, and 4. Separation Techniquesstudies will give and provide a basic understanding of the principles, instrumentation and applications of chemical analysis as it is currently practiced.	
12	Topic: **1. Introduction** The Scope of Analytical Chemistry	

	The Function of Analytical Chemistry Analytical Problems and Their Solution The Nature of Analytical Methods Trends in Analytical Methods and Procedures Glossary of Terms **2. The Assessment of Analytical Data** 2.1 Definitions and Basic Concepts 2.2 The Nature and Origin of Errors 2.3 The Evaluation of Results and Methods The Reliability of Measurements The Analysis of Data TheApplication of Statistical Tests Limits of DetectionQuality Control Chart Standardization of Analytical Methods Chemometrics. Problems **3. pH, Complexation and Solubility Equilibria** 3.1 Chemical Reactions in Solution Equilibrium Constants Kinetic Factors in Equilibria 3.2 Solvents in Analytical Chemistry Ionizing Solvents. Non-ionizing Solvents 3.3 Acid–baseEquilibria Weak Acid and Weak Base Equilibria Buffers and pH Control The pH of Salt Solutions 3.4 ComplexationEquilibria The Formation of Complexes in Solution The Chelate Effect 3.5 Solubility Equilibria Solubility Products Problems **4. Separation Techniques** 4.1 Solvent Extraction Efficiency of Extraction. Selectivity of Extraction Extraction Systems. Extraction of Uncharged Metal Chelates Methods of Extraction Applications of Solvent Extraction 4.2 Solid Phase Extraction Solid Phase Sorbents Solid Phase Extraction Formats AutomatedSolid Phase Extraction Solid Phase Micro extraction Applications of SPE and SPME 4.3 Chromatography 4.3.1 Gas Chromatography 4.3.2 High Performance Liquid Chromatography 4.3.3 Supercritical Fluid Chromatography.

	4.3.4 Thin-layer Chromatography. 4.3.5 Ion-exchange Chromatography 4.3.6 Size Exclusion Chromatography 4.4 Electrophoresis Factors Affecting Ionic Migration Effect of TemperaturepH and Ionic Strength Electro-osmosisSupporting Medium Detection of Separated Components Applications of Traditional Zone Electrophoresis High-performance Capillary Electrophoresis Capillary Electro chromatography Applications of Capillary Electro chromatography Problems
14	Main references: **Principles and Practice of Analytical Chemistry,** Fifth Edition**,** F.W. FifieldKingston Universityand**,** D. Kealey**,** University of Surrey.
5	Additional references: MODERN ANALYTICAL CHEMISTRY