

B. Sc. Degree Course Outcomes (COs)

CO-1 The graduates know the structure of atoms and bonding in molecules.

CO-2 They know basic concepts such as acid, base and various types of salts.

CO-3 They can describe stereochemical aspects.

CO-4 They are familiar with inorganic and organic polymers.

CO-5 Apply knowledge of metal, semiconductor and super conductors for day to day life.

CO-6 They know relation between chemical matter and life processes.

CO-7 They know about kinetic and thermodynamic aspects of various reactions.

CO-8 They can apply knowledge of nuclear reactions for generation of energy

CO-9 They are familiar with knowledge of medicines, dyes, soap, detergents, petroleum and other natural products.

CO-10 They are familiar with spectroscopic techniques which is applied in various human activities.

CO-11 They are equipped with knowledge of agrochemical and pest management.

CO-12 These graduates know about modern views and theories of atomic structure.

CO-13 They know about spectroscopic technique study with mathematical background.

CO-14 They have knowledge of photochemistry

CO-15 They have knowledge of electrochemistry

M. Sc. (Analytical Chemistry) Degree Course Outcomes (COs)

CO-1: Students will be able to explain the basic chemistry of transition metals and its compounds, spectroscopic characteristics of such compounds, nomenclature, reactions and applications.

CO-2: Students will obtain knowledge about Preparation, structure, physical and chemical properties of metal carbonyls of transition metals.

CO-3: Students will be able to understand the all aspects of synthesis, bonding, structure and reactivity of organometallic compounds and their applications in homogenous catalysis.

CO-4: Student will be able determine the stability of the complexes and will be able to explain the nuclear stability and reactions.

CO-5: Students will able to differentiate between various) organic reactive intermediates.

CO-6: Students can recognize, classify, explain, and apply fundamental organic reactions.

CO-7: Students will have ability to distinguish between different kinds of isomers.

CO-8: Course will develop interest in writing and finding mechanisms of new reactions.

CO-9: Students will be able to understand basic principles) of thermodynamics and statistical mechanics

CO-10: Able to learn advanced topics like quantum statistics and molecular dynamic simulation methods.

CO-11: Develop abilities to understand how to estimate and analyse the physicochemical properties of condensed and gas phase materials.

CO-12: Able to utilize spectral data to estimate molecular thermodynamic properties through partition function calculations.

CO-13: Understand properties of detergents and colloidal materials.

CO-14: Learns the principles and techniques to understand gas and liquid adsorptions on solid surfaces

CO-15: Can learn spectral techniques to study surface adsorption phenomena.

CO-16: Learn principles and techniques for estimation of average molecular weight of a polymer or biological macromolecules

CO-17: Develop abilities to characterize polymers through understanding theories of virial coefficients, concepts of glass transition temperatures, etc.

CO-18: Students would acquire the knowledge about the fundamentals of Analytical Chemistry including the sampling, sample pre-treatment, basic techniques, methods and data handling, processing and statistical analysis of the

CO-19: Students would acquire the knowledge and understand the scope of Analytical Chemistry spanning various fields. The students will learn fundamentals of qualitative analysis using conventional techniques

CO-20: Students will learn the chromatographic techniques, choice of chromatographic techniques and tuning of the chromatographic technique as per the need based on the samples to deal with, learn electroanalytical techniques and computation chemistry which would groom them for alternative analytical strategies which form one of the important components of analytical chemistry.

CO-21: Students will learn about referring to the standard reference books and infer information from the same. Analytical case study problems would be discussed to familiarize with the scope and advantages of Analytical Chemistry.

CO-22: Students will get the knowledge of the basic chemistry of non-transition elements and their compounds, synthesis and structural features, and applications.

CO-23: To be able to explain the structures of inorganic compounds based on different theories. Student will understand the chemistry of various types of solvents.

CO-24: Be well versed with the knowledge about the chemistry of Lanthanides and Actinides with respect to occurrence, separation, compounds and applications.

CO-25: To understand the three dimensional structures of solid-state materials of industrial importance and to get the knowledge of bio-inorganic Chemistry.

CO-26: Illustration of modern synthetic methods and applications of reagents.

CO-27: Provide knowledge of different organometallic compounds and various coupling reactions.

CO-28: Understand principle and applications of protection and deprotection of various functional groups.

CO-29: It will elaborate to understand the concept of chemo selectivity, regioselectivity and enantioselectivity.

CO-30: Students will learn basics of quantum mechanics.

CO-31: Knowledge of the course will form the basis or essential requirement for the course "Advanced Quantum Chemistry"

CO-32: Able to understand selection rules and to predict the electronic spectra of conjugated organic molecules.

CO-33: Able to study photochemical and photo-physical phenomena

CO-34: Capable of qualitative and quantitative analysis of various ingredients from industrial, food and pharma samples using techniques of emission spectroscopy.

CO-35: Capable of understand the electrochemical aspects of materials, ionic processes and electrochemical sensors, battery materials and characterizations etc.

CO-36: Able to study electro-kinetic effects and their applications in the field of protein separation, characterization etc.

CO-37: Understanding the molecular dynamics through kinetic studies. Applications to explore reaction pathways, protein-ligand binding rates, etc. will help to understand life governing processes.

CO-38: Students will acquire the knowledge of spectroscopic tools/instruments used in chemical analysis and interpretation of the data. The scope and limitations of the spectroscopic tools would be discussed so that the students learn about the type of samples which could be analyzed by these tools offering choices among the spectroscopic tools.

CO-39: Students will learn about the simple and advanced instruments used for analysis like NMR, MS, AAS, ICP and thermal analysis (TGA, DTA, DSC etc.) techniques spanning wide variety of samples to be considered for analysis.

CO-40: Students will learn about the instrumentation, sample preparation and handling of sample, analysis and data interpretation and structural elucidation.

CO-41: Learning about different instruments will give them idea about appropriate chemistry of the instrument for analysis.

Practical - I

CO-1: Ability in professional sampling and sample treatment before actual analysis

CO-2: Ability to treat and evaluate the results of analysis

CO-3: Understanding and capability of performing basic chemical processes in a chemical laboratory

CO-4: Capability of performing measurements on basic analytical instruments (photometers, spectrometers, chromatographs, ion-selective electrodes)

CO-5: Students can be able to prepare various concentration solutions like molar, normal, ppm, etc.

CO6: Determine the rate constants of various first order and second order reactions

CO-7: Determine the redox potential of a system, relative strength of acid etc using potentiometer, conductometer.

Based on the source and type of analyte(s) in the sample under consideration.

CO-8: Students developed for precise sample solution preparation and sample treatment before actual analysis.

CO-9: Students can be able to perform the calculations and error analysis

CO-10: Develop understanding of basic chemical processes and deciding methods of analysis.

CO-11: Capability of performing measurements on basic analytical instruments (photometers, spectrometers, chromatographs, high end thermometers, refractometer, pH meter etc.)

CO-12: Students can be able to prepare various concentration solutions like molar, normal, ppm, etc.

CO-13: Determine the unknown concentration and thermodynamic parameters using conductometer

CO-14: Student will explore how to estimate order of reaction and the catalysis

CO-15: students can estimate refractive index and molecular weights of species.

CO-17: Students can understand the estimation of equilibrium properties like redox potential, phase diagram etc.