

Maulana Azad College, kolkata
Department: Chemistry

Course Outcome under (CCF) of Chemistry Honours
Semester I

Course Code	Course Name	Course Outcome
CC1	Fundamentals of Chemistry-I	<p>CO-1: Provide students with a comprehensive understanding of the extranuclear structure of atoms and their influence on chemical behavior and also explore the periodic table, periodic trends, and their correlation with atomic structure.</p> <p>CO-2: fundamental concepts of organic chemistry, focusing on the nature of chemical bonding and the relationship between molecular structure and physical properties</p> <p>CO-3: Provide a foundational understanding of thermodynamics and chemical kinetics.</p>
SEC1	Quantitative Analysis and Basic Laboratory Practices	<p>CO-1: Introduce students to the fundamental principles and techniques of quantitative analysis and its broad applications across various scientific fields</p> <p>CO-2: Introduce the principles and methods of titrimetric analysis, focusing on different types of titrations and their applications; learn about key concepts such as normality, molarity, molality, mole fraction, ppm, and ppb, along with the preparation and dilution of standard solutions</p> <p>CO-3: Learn about impurities in water and the standards for water quality for potable, domestic, industrial, and agricultural purposes; provide students with a solid foundation in water quality analysis and treatment, essential for ensuring safe and sustainable water use.</p>

Semester II

Course Code	Course Name	Course Outcome
CC2	Fundamentals of Chemistry - II	<p>CO-1: Understand the fundamental principles of the kinetic theory of gases, including molecular motion, gas laws, and the behavior of ideal and real gases.</p> <p>CO-2: Learn about different types of chemical bonds, including ionic, covalent, and metallic bonds; understanding bond formation, bond energy, hybridization, molecular geometry, and the impact of bonding on molecular properties.</p> <p>CO-3: Develop a deeper understanding of stereochemistry; Gain foundational knowledge of reaction mechanisms, including types of reactions (substitution), reaction intermediates, and the role of energy profiles in determining reaction pathways.</p>
SEC 2	AI for Everyone	CO-1: Understand Artificial Intelligence (AI) and its difference from human intelligence; explore core AI subfields e.g. machine learning, deep learning

		<p>and neural networks</p> <p>CO-2: Introductory understanding of AI's role in healthcare , finance, transportation, customer service, and education; Gain knowledge on critical ethical concerns including bias and fairness in AI systems, privacy and data protection, the impact of AI on employment, and its role in amplifying social inequality.</p> <p>CO-3: Gain knowledge on ethical guidelines and responsible AI practices; explore how AI drives innovation across industries and examine emerging trends and future directions in AI technology</p>
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Semester III

Course Code	Course Name	Course Outcome
CC3	Physical Chemistry - I	<p>CO-1: Develop thorough understanding of the second law of thermodynamics, its principles, and applications; learn about thermodynamics of pure and mixed systems</p> <p>CO-2: Gain insight on thermodynamic conditions for equilibrium and explore the relationship between standard Gibbs free energy change and reaction conditions</p> <p>CO-3: Gain a detailed understanding of electrochemical principles, focusing on conductance and ionic equilibrium; Develop a solid foundation in electrochemical processes and their applications in various fields.</p>
CC4	Organic Chemistry – I	<p>CO-1: In-depth exploration of aromatic substitution reactions, focusing on both electrophilic and nucleophilic mechanisms; Introduces fundamental concepts of organic acids, bases, and tautomerism, with a focus on pKa, the effects of substituents and solvents on acidity</p> <p>CO-2: Build solid foundation in the principles of stereochemistry, conformational analysis, and reaction mechanisms, enabling them to apply this knowledge to understand and predict the outcomes of organic reactions</p> <p>CO-3: Develop a strong grasp of the chemistry of alkenes and alkynes, including their structural features, reactivity patterns, and various addition reactions; build understanding and predicting the behavior of these compounds in organic synthesis and other applications.</p>
SEC3	Introduction to Numerical Methods for Chemists	<p>CO-1: Equip students with a deep understanding of the fundamental principles and techniques used in numerical analysis. Students will learn about various numerical methods, their applications, and their limitations</p>

	<p>CO-2: Gain ability to use these methods to solve equations, approximate functions, and analyze data efficiently and accurately that focuses on practical application of numerical methods in different fields</p> <p>CO-3: Enhance students' ability to identify and solve problems using numerical techniques and learn to analyze problems, choose appropriate methods, and interpret the results</p>
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Semester IV

Course Code	Course Name	Course Outcome
CC5	Inorganic Chemistry – I	<p>CO-1: Understanding of the principles of molecular orbital theory and its application to different types of chemical bonding; Gain ability to analyze the structure and properties of molecules based on their electronic structure and intermolecular interactions.</p> <p>CO-2: Build solid understanding of acid-base chemistry, including the different definitions, concepts, and their applications in aqueous solutions; develop ability to analyze acid-base equilibria, calculate pH, and select appropriate indicators for acid-base titrations.</p> <p>CO-3: Acquire basic knowledge of radioactivity, nuclear stability, and various nuclear reactions; build understanding on the principles and applications of radiocarbon dating</p>
CC6	Organic Chemistry – II	<p>CO-1: Comprehensive understanding of conformational analysis and chiral molecules, including pro-stereoisomerism and chirality arising from stereoaxes; gain ability to analyze the stereochemistry of various molecules and predict the potential for stereoisomerism</p> <p>CO-2: Develop comprehensive understanding of the chemistry of carbonyl compounds, including their structure, reactivity, and various transformations. They will be able to apply this knowledge to design and analyze organic synthesis routes involving carbonyl compounds</p> <p>CO-3: Build solid understanding of organometallic compounds, their preparation, reactions, and applications acquire ability to utilize these reagents effectively in organic synthesis to form new carbon-carbon bonds and introduce functional groups.</p>
CC7	Physical Chemistry - II	<p>CO-1: Build strong foundation in transport processes and the properties of liquids; gain understanding on diffusion, viscosity, and surface tension, as well as their underlying principles and applications.</p>

		<p>CO-2: Develop solid understanding of the structure and properties of solids; acquire the ability to analyze crystal structures, determine unit cell dimensions, and apply Bragg's law to diffraction experiments</p> <p>CO-3: Build a strong understanding of colligative properties, phase equilibria, and electrochemistry; Gain ability to apply these concepts to various systems, calculate molar masses, analyze phase diagrams, and understand the principles of electrochemical cells and their applications.</p>
CC8	Inorganic Chemistry – II	<p>CO-1: Acquire solid understanding of coordination chemistry, including fundamental concepts, theories, and applications; Gain ability to analyze the structure, bonding, spectra, and magnetic properties of coordination compounds</p> <p>CO-2: Develop a strong understanding of the principles and applications of supramolecular chemistry; Gain ability to analyze the role of non-covalent interactions in the formation and stability of supramolecular</p> <p>CO-3: Build a solid understanding of redox reactions, including their principles, balancing, and applications; gain ability to analyze redox processes, predict the feasibility of redox reactions, and perform redox titrations</p>