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4 Years Bachelor of Science B.Sc. (Hons.) in Chemistry under CBCS

Course Outcomes (Major Courses)

S.No	UG Semester	Course	Course Outcomes
1.	I	MJC-1 Inorganic Chemistry: Atomic Structure, Chemical Bonding and fundamentals of organic Chemistry	CO1- The model of an atom including the related various principles CO 2- The principles of bonding as well as shapes and structure of covalent molecules. CO 3- Initial step research in Organic Chemistry viz-Detection, Separation and Purification of Organic Compounds.
2.	II	MJC-2 Physical Chemistry: States of matter and Ionic Equilibrium	CO 1- The mathematical expressions for different Properties of gas, liquid and solid and understand their physical significance. CO2- The Crystal structure, and may calculate related properties of different crystal systems. CO3- The concept of ionization of electrolytes with emphasis on weak acid and base and hydrolysis of salt. CO4- The concepts of pH, PK_a, PK_b PK_w, Buffer Solutions, Solubility Product etc, and their applications in day to day life.
3.	III	MJC-3 Organic Chemistry: Cyclic Hydrocarbons and their Halogen Derivatives	CO1: The aromatic character of the molecules. CO2: - The idea to design some organic synthesis.
4	III	MJC-4 Physical Chemistry: Chemical Thermodynamics and its Applications	COI: Various thermodynamic terms. CO2: Various enthalpies of transformations and Kirchoff's law CO3: Entropy changes, Gibbs free energy change, partial molar quantities. spontaneous and non- spontaneous processes. CO4: Second and third law of thermodynamics.
5.	IV	MJC-5 Inorganic Chemistry: s-, p-, d- and f-block elements	CO1: Different oxidation states of elements with their relative stability and complex forming properties. CO2: The ring, cage and polymers of B. Si & P. CO3: To carry out the preparation of inorganic compounds. CO4: The important properties of transition metals such as their oxidation states, colour, magnetic and spectral, use of Latimer diagrams in identifying oxidizing, reducing and disproportionating species. CO5: The concepts related with noble gases, their compounds, shapes, properties and applications.

6	IV	MJC-6 Organic Chemistry: Compounds with Oxygen Containing Functional Groups	CO1: Preparation, properties and reactions of compounds with oxygen. CO2: Containing functional groups. to draw plausible mechanisms for reactions involving these functional. CO3: The knowledge of various named organic reactions associated with these functional groups. CO4: Chemistry of epoxides. CO5: The detection of O-containing functional groups like alcohols, phenols, carbonyl and carboxylic acid groups. CO6: The preparation of various organic compounds by functional group transformations and other common organic reactions. CO7: The green practices in Organic syntheses.
7.	IV	MJC-7 Physical Chemistry: Phase Equilibria, Conductance and Electrochemical Cells	CO1: The degree of ionization, pH and salt hydrolysis CO2: The different types of Buffer solutions. CO3: The concepts of solubility product CO4: The conductivity, specific conductivity, equivalent conductivity and molar conductivity, application of conductance measurement in determining various physical parameters CO5: The standard electrode potential of half cells and calculate the EMF of a cell using Nernst equation. CO6: EMF measurements in determining various parameters like free energy. Enthalpy, entropy, equilibrium constants, etc. CO7: The concentration cells with and without transference. CO8: The principle of potentiometric titrations.
8.	V	MJC-8 Co-ordination Chemistry	CO1: Ligand, denticity of ligands, chelates, coordination number and nomenclature coordination of compounds.. CO2: Isomerism in coordination compounds. CO3: Valence Bond Theory to predict the structure and magnetic behavior of metal complexes CO4: Pairing energy, CFSE and its effects, high spin and low spin complexes. CO5: Magnetic properties and colour of complexes on the basis of Crystal Field Theory. CO6: Properties of transition metal complexes, variable oxidation states, colours, magnetic and catalytic properties.
9.	V	MJC-9 Polynuclear hydrocarbons, nitrogen containing compounds, heterocyclic	CO1: The chemistry of polynuclear hydrocarbons CO2: The named reactions related to amines nitriles, isonitriles and diazo compounds. CO3: The chemistry of some common heterocyclic compounds.

		compounds, alkaloids and terpenoids	CO4: The general methods involved in structural elucidation of alkaloids and terpenoids.
10.	VI	MJC-10 Colligative Properties of Dilute Solutions, Chemical Kinetics and Photochemistry	CO1: Colligative properties of dilute solutions and determination of these properties. CO2: Abnormal colligative properties and molar mass. CO3: Azeotropes, maximum and minimum boiling azeotropic mixture. CO4: Kinetics of simple and complex reactions. CO5: Jablonski diagram and laws of photochemistry.
11.	VI	MJC-11 Organic Chemistry: Biomolecules	CO1: Genetic materials involved in living biosystems. CO2: Physicochemical properties of amino acids, peptides and proteins. CO3: Enzymes and their activity as well as some basic idea about lipids. CO4: Basics of energetics in biosystems and introduction to some synthetic and naturally occurring pharmaceuticals.
12.	VI	MJC-12 Physical Chemistry: Quantum Chemistry &Spectroscopy	CO1: The postulates of quantum mechanics, Schrödinger's wave equation and its applications CO2: The concepts related to electronic and rotational spectra. CO3: The concepts related to vibrational and Raman spectra.
13.	VII	MJC-13 Inorganic Chemistry: Organometallic Chemistry, Symmetry and Group theory	CO1: Nomenclature and classification of Organometallic compounds. CO2: Properties of metal carbonyls including their structures. CO3: Methods of preparation of Organometallics. CO4: Concept of symmetry and group theory.
14.	VII	MJC-14 Research Methodology	
15.	VII	MJC-15 Organic Chemistry: Spectroscopy	CO1: Different types of electronic transitions in organic molecules. CO2 : The principles related to ultraviolet spectroscopy. CO3: Different types of vibrations in organic molecules and the principles related to infrared spectroscopy CO4: The nuclear spin, shielding and deshielding effects and the principles of NMR CO5: The principles of ESR spectroscopy
16.	VIII	MJC-16 Analytical Methods in Chemistry	COI: Understand accuracy and precision. CO2: Develop methods of analysis for different samples independently

			CO3: Test contaminated water samples CO4: Understand basic principle of instrument like Flame Photometer, UV-vis spectrophotometer CO5: Learn separation of analytes by chromatography