

CORE COURSE OUTCOME OF CHEMISTRY HONOURS PROGRAMME BASED ON CBCS CURRICULUM

Semester	Course code	Course name	Course outcome
I	CC1	Atomic Str. & Chemical Bonding	<ul style="list-style-type: none"> • Understand the Atomic Structure. • Know the Pauli's Exclusion Principle, Hund's rule of maximum multiplicity, Aufbau's principle and its limitations, Variation of orbital energy with atomic number. • Understand the Chemical Bonding. • Redox equations, Standard Electrode Potential and its application to inorganic reactions. Principles involved in volumetric analysis to be carried out in class
	CC2	States of Matter & Ionic Equil.	<ul style="list-style-type: none"> • They will learn about the Kinetic molecular model of a gas: postulates and derivation of the kinetic gas equation; collision frequency; collision diameter; mean free path and viscosity of gases. • Understand the Qualitative treatment of the structure of the liquid state; Radial distribution function; physical properties of liquids; vapour pressure, surface tension and coefficient of viscosity, and their determination. Effect of addition of various solutes on surface tension and viscosity.
II	AECC	Environmental Studies	<ul style="list-style-type: none"> • Students learn about the concept and benefits of a sustainable environment • They learn about biodiversity and bio conservations. • They get aware of natural resources and their limitations. • They also get aware of pollution and its prevention measures. • They learn about the environmental policies, their implications and their repercussions. • They are familiar with various environment-related activities and movements
	CC3	Basics and Hydrocarbons	<ul style="list-style-type: none"> • Understand the Purification of organic compounds by crystallization • Know the Chromatography • Know the boiling point of liquid compounds

	CC4	Chem. Thermodynamics & Appl	<ul style="list-style-type: none"> • Understand the Chemical Thermodynamics • Understand the Partial molar quantities, dependence of thermodynamic parameters on composition; GibbsDuhem equation, chemical potential of ideal mixtures, change in thermodynamic functions in mixing of ideal gases.. • Know the Dilute solutions; lowering of vapour pressure, Raoult's and Henry's Laws and their applications.
III	SEC1	Elementary computer application software	<p>In this fast-growing Information Technology era, knowledge of computer applications is vital for growth and development.</p> <ul style="list-style-type: none"> • Students are aware of basic computer systems and their operations. • They develop basic software skills like Microsoft Office (Word, PowerPoint and Excel) to enable them for day-to-day needs. • In a recent pandemic, computer knowledge has helped them to opt for an online mode of learning.
	CC5	s- and p-Block Elements	<ul style="list-style-type: none"> • Understand the Inert pair effect, Relative stability of different oxidation states, diagonal relationship and anomalous behaviour of first member of each group. Allotropy and catenation. Complex formation tendency of <i>s</i> and <i>p</i> block elements • Know the Occurrence and uses, rationalization of inertness of noble gases, Clathrates; preparation and properties of XeF₂, XeF₄ and XeF₆; • Understand the Types of inorganic polymers, comparison with organic polymers, synthesis, structural aspects and applications of silicones and siloxanes.
	CC6	Oxygen Containing Functional Gps	<p>Understand the <i>Alkyl halides</i>: Methods of preparation, nucleophilic substitution reactions – S_N1, S_N2 and S_Ni</p> <ul style="list-style-type: none"> • To Know mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitution vs. elimination. Gain knowledge about the various plants of economic use. • To Know importance <i>Alcohols</i>: preparation, properties and relative reactivity of 1°, 2°, 3° alcohols, Bouvaelt-Blanc Reduction; Preparation and properties of glycols: Oxidation by periodic acid and lead tetraacetate, Pinacol-Pinacolone rearrangement;
	CC7	Phase Equil. and Chem. Kinetics	<ul style="list-style-type: none"> • To study Concept of phases, components and degrees of freedom, derivation of Gibbs Phase Rule for nonreactive and reactive systems

			<p>Types of catalyst, specificity and selectivity, mechanisms of catalyzed reactions at solid surfaces</p> <ul style="list-style-type: none"> To understand the Chemical Kinetics, Temperature dependence of reaction rates
IV	SEC 2	Fuel Chemistry	<ul style="list-style-type: none"> Know about <i>Petroleum and Petrochemical Industry</i>: Composition of crude petroleum, Refining and different types of petroleum products and their applications <p>To understand <i>Lubricants</i>: Classification of lubricants, lubricating oils (conducting and non-conducting)</p>
	CC8	Coordination Chemistry	<p>On completion of the course, students are able to Understand the following</p> <ul style="list-style-type: none"> Know about Werner's theory, valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory Know about IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Know about Stereochemistry of complexes with 4 and 6 coordination numbers
	CC9	Heterocyclic Chemistr	<ul style="list-style-type: none"> Know the scope and importance of the discipline. Understand plant communities and ecological adaptations in plants. Learn about Biotic interaction, population ecology, Ecosystem and its fictional aspects. Understand the principal of phytogeography
	CC10	Electrochemistry	<ul style="list-style-type: none"> Know the concept Preparation and important reactions of nitro and compounds, nitriles and isonitriles Know the conceptual Classification and nomenclature, Structure, aromaticity in 5-numbered and 6-membered rings containing one heteroatom; Synthesis, reactions and mechanism of substitution reactions Learn about the Natural occurrence, General structural features, Isolation and their physiological action
V	DSE1	Analytical Methods in Chemistry	<ul style="list-style-type: none"> Understand the Qualitative and quantitative aspects of analysis. Know the Origin of spectra, interaction of radiation with matter, fundamental laws of spectroscopy and selection rules. Understand the <i>UV-Visible Spectrometry</i>: Basic principles of instrumentation (choice of source, monochromator and detector) for single and double beam instrument; Understand the <i>Basic principles of quantitative analysis</i>: estimation of metal ions from

			aqueous solution, geometrical isomers, keto-enol tautomers. Determination of composition of metal complexes using Job's method of continuous variation and mole ratio method
	DSE2	Polymer Chemistry	<ul style="list-style-type: none"> • Understand the Different schemes of classification of polymers, Polymer nomenclature, Molecular forces and • chemical bonding in polymers, Texture of Polymers • Criteria for synthetic polymer formation, classification of polymerization processes, Relationships between functionality, extent of reaction and degree of polymerization.
	CC11	Biomolecules	<ul style="list-style-type: none"> • Explain components of Nucleic Acids. • Describe the structure classification of Amino Acids, Peptides and Proteins • Combine the structure and functions of lipids. • Define saponification number, acid number and iodine number of fats.
	CC12	Quantum Chem. & Spectroscopy	<ul style="list-style-type: none"> • Understanding Schrödinger equation and its application to free particle • Understand Qualitative treatment of simple harmonic oscillator model of vibrational motion • Understanding molecular spectroscopy
VI	DSE3	Green Chemistry	<ul style="list-style-type: none"> • Explain Definition, Need and limitation • Apply Principles of Green Chemistry and Designing a Chemical synthesis
	DSE4	Industrial Chemicals & Environment	<ul style="list-style-type: none"> • Know the application of industrial gases and chemical • Understand the principle of metallurgy
	CC13	Organometallic Chemistry	<ul style="list-style-type: none"> • Understand organometallic compounds on the basis of bond type • Understand metal carbonyl and metal alkyl
	CC14	Spectroscopy	<ul style="list-style-type: none"> • Know the principle of ultraviolet and infrared spectroscopy • Understand application of spectroscopy • Understand Occurrence, classification and their biological importance of carbohydrates

GENERAL ELECTIVE OUTCOME OF BOTANY FOR OTHER SUBJECTS

Semester	Course code	Course name	Course outcome
I	GE 1	Atomic Structure, Bonding, General Org Chem & Aliphatic Hydrocarbons	<ul style="list-style-type: none"> • Know atomic structure and bonding • Understand aliphatic hydrocarbon
II	GE 2	Chemical Energetics, Equilibria & Functional Gp Org Chemistry	<ul style="list-style-type: none"> • Understand Chemical equilibrium • Know Functional group of organic chemistry
III	GE 3	Chem. of s- and p-block elements, States of matter and Chem. Kinetics	<ul style="list-style-type: none"> • Understand s,p block element • Know states of matter
IV	GE 4	Chem. of d-block elements, Molecules of Life	<ul style="list-style-type: none"> • Understand d block element • Know molecules of life