



BELDA COLLEGE

Belda, Pachim Medinipur, 721424

DEPARTMENT OF CHEMISTRY

COURSE OUTCOME (CO):: BACHELOR OF SCIENCE :: CHEMISTRY(HONOURS)

Class	Paper	Course	Course Outcome
1 st Year (Hons.)	Paper-I	CO-1	To appreciate bonding in organic compounds, acidity and basicity of organic acids and base stereochemistry of alicyclic compounds, optical activity of chiral compounds, elementary idea of topic of ligand and faces, and to know general principles of reaction mechanism. To understand atom structure, chemical bonding, periodic properties, theories of acids and bases, principle of solubility equilibria and properties of selected s- and p- block elements and their compounds.
	Paper-II	CO-2	To understand kinetic theory of gases, equations of state of real gases, the principle of equilibrium thermodynamics and its applications, kinetics of reactions and theories of reaction rates, various catalysts and their mechanisms. To study surface properties of liquids, adsorption phenomena and chemistry of colloids. To get an idea about the different types of fluids and their properties. To understand error precision and statistics in analysis, basic principles of chromatographic separation. To have knowledge about the manufacturing of different fuels, some important industrial products and chemistry of oils and fats.
2 nd Year (Hons.)	Paper-III	CO-3	To understand different types of elimination and addition reactions, chemistry of carbonyl and nitrogen containing compounds, different types of aromatic substitution reactions, preparation and uses of organometallics, and different types of molecular rearrangements. To get knowledge about nuclear chemistry, redox chemistry, chemical bonding in terms of VB, MO, LCAO and band theory, close packing of crystalline solids. To understand what coordination compounds are, their naming, ligands, stabilities and properties of p-block elements and their compounds.
	Paper-IV	CO-4	To understand applications of thermodynamic to open system, non-electrolyte solutions and chemical equilibrium. To know about ionic equilibrium, electrical properties of ionic solutions, electrochemical cells and applications of EMF measurements. To understand development of quantum mechanics and postulates.
	Paper-V	CO-5	To develop skills required to carry out qualitative analysis of organic compounds and preparation of the derivatives, systematic qualitative analysis of inorganic sample containing not more than four radicals (basic and acid) and selected physical chemistry experiments.
3 rd Year (Hons.)	Paper-VI	CO-6	To know how to use the spectroscopic methods such as UV, IR and NMR for the characterisation of organic compounds. To understand the chemistry of carbohydrates, heterocyclic compounds, amino acids, proteins and nucleic acids, general strategy for synthesis of organic molecules and methodology employed for ring synthesis. To get informed with the important pericyclic reactions. To understand type of Isomerism, nature of bonding in coordination compounds, different aspects of magnetic chemistry, chemistry of d- and f-block elements, synthesis and uses of organometallic compounds. To get familiarized with the functioning and applications of bioorganic chemistry and Instrumental analysis using conductometric, potentiometric, polarography, UV-Visible and IR spectrophotometric methods.
	Paper-VII	CO-7	To get acquainted with how to solve the simple quantum mechanical models such as particle in a 1D and 3D- box, simple harmonic oscillator, rigid rotator, H atom. To understand different aspects of photochemistry and basics of statistical thermodynamics. To know phase rule and applications. To understand laws of crystallography and characterisation of crystals using X-Ray diffraction. To get insight into the fundamentals of microwave, IR, Raman spectra.
	Paper-VIII	CO-8	To impart skill required for preparing selected organic compounds, analysing organic compounds by IR and NMR. To know how to carry out different volumetric analysis for various estimations. To get skilled in doing physical chemistry experiments by using conductometer, potentiometer, pH-meter, colorimeter, etc.
Semester-I	C1T & C1P	CO-9	To get acquainted with bonding, physical properties, general reaction mechanism, stereochemistry of organic molecules, and how to separate a mixture of solid organic compounds and identify an organic compound by systematic analysis.
	C2T & C2P	CO-10	To understand the kinetic theory of gases, behaviour of real gases along with their equations of state. To know the laws and principles of chemical thermodynamics, and kinetic aspects of chemical reactions together with the theories of reaction rates. To impart skill to carry out selected physical chemistry experiments.



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Semester-II	C3T & C3P	CO-11	To understand quantum mechanical picture of the extra-nuclear structure of atom, different aspects of periodic table To impart knowledge of acid-base reactions and their theories, redox reactions, their diagrammatic summaries a redox titrations, and precipitation reactions with their principles. To make students get skilled at carry out acid-base and redox titrations.
	C4T & C4P	CO-12	To acquire knowledge of stereoisomerism of organic compounds such as cumulen ,allenesetc,configurational descriptors, the concepts of (pro)n-chirality, topicity of ligands the Klyn Prelog terminology, various possible conformations of organic compounds. To understand acidity a basicity of organic acids and bases, different substitution and elimination reactions of organic compound thermodynamics aspects of different organic reactions, and how to carry out the selected organic reaction

Semester-III	C5T & C5P	CO-13	To understand different aspects of transport processes of fluids, conductance and transport number of electrolyte solutions, applications of the principles of chemical thermodynamics to open systems, chemical equilibrium and ideal solutions. To understand basic postulates of quantum mechanics and how to solve the simple quantum mechanical models, and how to carry out different physical experiments as prescribed in the syllabus.
	C6T & C6P	CO-14	To understand ionic bonding, lattice energy with their associated rules and equations, the concepts of MO, LCAO, VSPER and band theories, and different aspects of radioactivity, and how to carry out selected iodo/iodimetric titrations and estimate metal content in some selective samples.
	C7T & C7P	CO-15	To appreciate the chemistry of alkenes and alkynes, different aromatic substitution reactions, reactions and mechanisms associated with different carbonyl and related compounds and organometallics. Students will be able to carry out qualitative analysis of single solid organic compounds.
	SEC-1T & 1P	CO-16	To understand the synthesis and properties of some representative drugs, how to prepare some selected compound through fermentation, the chemistry of some antibiotics and vitamins, and how to prepare and analyse Aspirin and magnesium bisilicate (Antacid).

Semester-IV	C8T & C8P	CO-17	To understand the applications of thermodynamics to different solutions properties, the concept of phase rule and its applications to systems of different components. To gain knowledge of properties of electrolyte solutions, electrolysis, applications of EMF measurements and quantum mechanics of rigid rotator, H-atom and many electron atoms (He, Li), the basics of Hartree-Fock method, SCF and configuration interaction and to carry out some physical chemistry experiments as in the syllabus.
	C9T & C9P	CO-18	To understand general principles of metallurgy, chemistry of s, p block elements, noble gases and inorganic polymers, and Werner's theory, IUPAC nomenclature and isomerism of coordination compounds, and to carry out complexometric titration of selected ions and prepare inorganic compounds as specified in the syllabus.
	C10T & C10P	CO-19	To know chemistry and synthesis of different aliphatic and aromatic nitrogen compounds, different types of organic rearrangement reactions, various methods and reagents employed in organic synthesis and the applications of spectroscopic methods (UV, IR and NMR) for the characterisation of organic compounds. Students will be able to carry out estimation of different organic compounds as prescribed in the syllabus.
	SEC2T & 2P	CO-20	To gather knowledge of preparation and uses of some cosmetics and perfumes. Students will be able to prepare different cosmetics and perfumes as specified in the syllabus.

Semester-V	C11T & C11P	CO-21	To understand bonding, magnetic and spectral properties of coordination compounds, chemistry of d- and f- block elements, and how to carry out gravimetry estimation of ions as specified in the syllabus.
	C12T & C12P	CO-22	To understand chemistry and synthesis of different carbocycles and heterocycles, cyclic stereochemistry and to get insight into pericyclic reactions, chemistry of carbohydrates and bio-molecules. Students will be able to carry out chromatographic separations of a mixture of selected organic compounds and analyse selected organic compounds spectroscopically (IR & ¹ H NMR).
	DSE1T & 1P	CO-23	To get insight into the crystalline structure of solids and statistical thermodynamics. To understand the special selected topics on solids and polymers. Students will be able to solve chemical problems (as prescribed in the syllabus) by computer programs based on numerical methods.



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Semester-VI	DSE2 T& 2P	CO-24	To understand qualitative and quantitative aspects of analysis, and how to employ different methods such as Optical, Thermal, Electro-analytical and separation techniques for chemical analysis, and how to carry out chromatography separation of selected mixtures, separate selected mixtures by solvent extraction and estimate COD and BOD of water.
	C13T &C13 P	CO-25	To get insight into bioinorganic chemistry, organometallic chemistry, catalysis of some selected reaction by organometallic compounds and kinetics and mechanism of reactions of inorganic complexes, and how to carry out qualitative semimicro analysis of mixtures containing four radicals.
	C14T &C14 P	CO-26	To study the origin, theory and important applications of Microwave, IR, Raman, UV, NMR, ES spectroscopy. To get insight into photochemistry, its laws and applications. To know phenomena related to surface such as surface tension, adsorption and colloids. To carry out selected physical chemistry experiments.
	DSE 3T & 3P	CO-27	To get acquainted with the manufacturing of selected glasses, ceramics, cements, fertilizers, catalyst, chemical explosive and formulations of paints and pigments. To know types of batteries, their function and types of alloys, their manufacturing and applications. To get knowledge of synthesis, characterization and applications of nano materials. To carry out selected inorganic practicals.
	DSE 4T& 4P	CO-28	To get insight into different types of polymers and their properties, polymerizations and their kinetics. To get skilled at synthesising some selected polymers, characterizing polymers and analysing by means of instruments such as IR, DSC, etc.