COURSE OUTCOME (CO)

B. Sc. (HONS.) in CHEMISTRY

Semester	Paper code & Name	Outcomes
I	CC1 (Organic Chemistry) C1T & C1P	• Know the basic of structure, bonding, reactivity and reaction mechanisms of molecules. • Identify the aromatic, anti aromaticity and non-aromatic compounds. • Identify electrophile, nucleophiles, free radicals and intermediates along the reaction pathways. • Understand stability of organic molecules, structure & stereochemistry. • Judge the solubility of the mixture of compounds. • Identify the pure organic compounds.
	CC2 (Physical Chemistry) C2T & C2P	• Understand the kinetic model of gas and its properties. • Understand the behaviour of real gas. • Understand the concept of heat, work, and laws of thermodynamics and different thermodynamic properties. • Know the concepts of chemical kinetics in different chemical processes. • Learn the mechanism of catalytic action and enzyme catalysis. • Carry out kinetics of decomposition of Hydrogen peroxide and decomposition of ester • Determine heat of solution of organic acid from solubility measurement and heat of neutralization of strong acid and base. • Determine pH of unknown buffer by colour matching method.
II	CC3 (Inorganic Chemistry) C3T & C3P	• Understand the atomic theory and its development. • Understand the concept of wave function and explain the quantum numbers and its significance. • Understand modern periodic law to explain periodic properties • Understand the acid-base behaviors of different organic and inorganic compounds. • Design acid and base titrations of mixture of compounds. • Produce the results of mixture of compounds by redox titration
	CC4 (Organic Chemistry) C4T & C4P	• Know about the concepts of stereochemistry. • Understand the different conformational nomenclature. • Learn nucleophilic substitution reactions mechanism by stereochemistry approach. • Assess the concept of elimination reactions. • Understand the basics of chemical kinetics in organic chemistry. • Check the yield of organic preparations. • Compare the melting point value of an experiment with the literature.

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III	CC5 (Physical Chemistry) C5T &C5P	• Acquire knowledge about different flow methods, especially viscosity of liquid and conductance of electrolyte solution. • Acquire knowledge about different application of thermodynamics: Chemical equilibrium, Nernst distribution law. • Know about concept of activity and fugacity • Know basic concepts of quantum mechanics: wave function, operators etc. • Apply quantum mechanics in particle in 1D box and harmonic oscillator • Determine coefficient of viscosity of different solution by Ostwald viscometer • Determine partition coefficient and verify Nernst distribution law • Determine strength of different acid solution by conductometric titration.
	CC6 (Inorganic Chemistry) C6T & C6P	• Explain the fundamental concepts of ionic bond and covalent bond. • Understand the basic principles involved in nuclear chemistry • Aware the advanced level of nuclear chemistry • Assess the knowledge on molecular orbital theory. • Design iodo-/ iodimetric titrations of a given sample. • Experimenting the estimation of metal content in some selective samples
	CC7 (Organic Chemistry) C7T & C7P	• Enhances the knowledge on name reaction with examples • Learn the mechanism of rearrangement reaction by using synthetic reagent . • Recognize various oxidation and reduction reactions. • Create interest and thinking in the mechanisms of organic reactions • Construct the qualitative analysis of single solid organic compounds. • Classify of the compound through literature survey
	SEC-1 (Pharmaceutical Chemistry) SEC1T & SEC1P	• Learn about drug analysis and synthesis. • Know the various green techniques for drug synthesis • Understand the pharmaceutical chemistry • Knowledge about antibiotic drugs • Design the preparation of drug and its analysis • Demonstrate the drug preparation procedure

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IV	CC8 (Physical Chemistry) C8T & C8P	⬩ Learn thermodynamic view on dilute solution and colligative properties. ⬩ Understand phase rule and phase diagram of different system ⬩ Understand the concept of ionic equilibrium ⬩ Learn about different types of electrodes, galvanic cells and application of emf measurement. ⬩ Apply the wave mechanics to one-electron system like hydrogen atom ⬩ Construct a potentiometric titration experiment ⬩ Construct phase diagram and determine critical solution temperature ⬩ Determine pKa value of weak acid by pH meter
	CC9 (Inorganic Chemistry) C9T & C9P	⬩ Learn the basic concept and theory in coordination chemistry ⬩ Know about complex formation, stability and nature of metal ligand bonding on coordination chemistry. ⬩ Understand the chemistry of a various of compounds of the s-block and p-block periodic elements ⬩ Know the applications of the compounds of s and p block elements in different industrial needs. ⬩ Assemble the experimental result on complexometric titration ⬩ Judge the metal content present in mixture of solution.
	CC10 (Organic Chemistry) C10T & C10P	⬩ Apply mechanism concept in retro synthesis reactions. ⬩ Understand about disconnection approach in retro synthesis. ⬩ Understand the fundamental principles of different spectroscopy. ⬩ Learn the mechanism of rearrangement reaction. ⬩ Investigate the saponification value of an experiment ⬩ Judge the quality of commercial product.
	SEC2 (Basic Analytical Chemistry) SEC2T & SEC2P	⬩ Make scientific reports from chemical experiments and draw conclusions ⬩ Formulate the important factors on analytical experiments and results ⬩ Understand the theoretical principles of various separation techniques in chromatography. ⬩ Test the metal present in a tablet by Spectrophotometric method ⬩ Investigate the acidity and alkalinity of a water sample by pH measurement.
	SEC2 (Fuel Chemistry) SEC2T	⬩ Know about different types of coal and its byproducts ⬩ Judge the quality of fuel ⬩ Acquire knowledge about oil refinery and petroleum industry ⬩ Acquire knowledge about different types of lubricants

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V	CC11 (Inorganic Chemistry) C11T & C11P	⬩ Understand the nature of metals of d-block elements. ⬩ Describe the bonding models, structures and applications of coordination complexes. ⬩ Acquire knowledge on crystal field theory. ⬩ Learn the chemistry of Lanthanoids and Actinoids ⬩ Demonstrate the chromatographic separations of metal ions ⬩ Understand the λ_{max} of metal complexes.
	CC12 (Organic Chemistry) C12T & C12P	⬩ Understand the principles of pericyclic reactions ⬩ Know the nomenclature of hetero-cyclic. ⬩ Know the synthesis and reactions of different heterocycle. ⬩ Know the optical activity & chirality of cyclohexane ⬩ Predict the δ-values and splitting pattern of a organic compounds. ⬩ Assign frequencies of the absorptions of a organic compounds.
	DSE - 1 (Advanced Physical Chemistry) DSE1T & DSC 1P	⬩ Acquire knowledge about solid state chemistry/ crystallography. ⬩ Know classical and quantum theory of heat capacity of solid. ⬩ Get an idea about of polymers. ⬩ Get an idea about classical statistical thermodynamics and quantum statistical thermodynamics on an elementary level. ⬩ Operate the computer programs on vander Walls equation. ⬩ Operate the computer programs on potentiometric titrations. ⬩ Operate the computer programs on matrix operations.
	DSE - 2 (Analytical Methods in Chemistry) DSE2T & DSE 2P	⬩ Gain the fundamental knowledge on spectroscopic instrumentation ⬩ Understand different types of electroanalytical methods. ⬩ Understand various separation techniques in chromatography. ⬩ Understand thermal methods of analysis. ⬩ Apply chromatographic separation techniques of mixtures of compounds. ⬩ Estimate the metal present in given compound.
	DSE - 2 (Instrumental Methods of Chemical Analysis) DSE2T & DSE 2P	⬩ Acquire knowledge about different spectroscopic methods. ⬩ Acquire knowledge about chromatography and other separation techniques. ⬩ Get idea about radiochemical methods. ⬩ Get idea about electroanalytical methods: Potentiometry & Voltammetry ⬩ Analysis of compounds and estimate metal ions in a mixture in spectroscopic method. ⬩ Determine calcium, Iron and Copper in Food by atomic absorption.

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VI	CC13 (Inorganic Chemistry) C13T & C13P	• Understand the biological aspects of metal. • Know about the function of the catalysts and its surface action • Identify the bonding of inorganic & organometallic compounds • Know about metal ion transport and storage. • Interpret the radicals present in a given compound • Assign the most probable composition in qualitative
	CC14 (Physical Chemistry) C14T & C14P	• Gain the theoretical knowledge about different molecular spectroscopy. • Learn about Beer Lamberts law and photo chemical Grouters- Dropper law. • Acquire knowledge about different photophysical and photochemical processes • Know about surface chemistry: Surface tension of liquid and adsorption • Acquire knowledge about preparation, properties and classification of colloids. • Verify Beers law and determine the strength of solution. • Determine surface tension of liquid.
	DSE - 3 (Green Chemistry) DSE3T & DSE3P	• Focus on the principles of green chemistry. • Learn alternative solvent media for chemical process. • Tell the future trends in green chemistry. • Learn the synthesis of any type of organic compounds with green chemistry • Understand the principle of atom economy. • Sketch an experiment by Safer starting materials.
	DSE - 3 (Inorganic Materials of Industrial Importance) DSE3T & DSE3P	• Acquire knowledge about different types of glass, ceramics and alloys. • Know about manufacturing process of different fertilizers. • Know about manufacturing process of cement and the setting process of cement • Know about different types of paints and their manufacturing process • Analysis of fertilizers and alloys. • Analysis of cement and determine iron content in cement.
	DSE – 4 (Polymer Chemistry) DSE4T & DSE4P	• Know different aspects of polymer chemistry. • Understand how different polymers are synthesized and characterized. • Assess kinetics and mechanism of polymer. • Know the structure and properties of polymers. • Construct a free radical solution polymerization reaction. • Test the quality of polymer by Instrumental techniques.