



**Department of Chemistry**  
**Kamrup College Chamata**  
**Course Outcomes (CO)**

**Paper Code: CHE-HC-1016**

**Paper Title: INORGANIC CHEMISTRY-I**

**Course Learning Outcomes**

**CO-1**: This course helps to learn the structure of atoms including wave mechanics.

**CO-2**: It introduces the periodicity of elements and periodic properties.

**CO-3**: It introduces the different types of chemical bonding including weak chemical forces and basic concept of redox reactions.

**CO-4**: It helps to learn the theory of titrimetric analysis of acid-base and oxidation-reduction titrations.

**Paper Code: CHE-HC-1026**

**Paper Title: PHYSICAL CHEMISTRY-I**

**Course Learning Outcomes**

**CO-1**: This course introduces the basic concept of kinetic theory of gases and learn to solve numerical problems related to the topic.

**CO-2**: It aids in learning the structural and physical properties of liquid.

**CO-3**: It helps to understand the elementary idea of molecular and crystal symmetry with symmetric operation along with the basic concept of solid state crystallography.

**CO-4**: It helps to understand the ionic behavior of solution, salt hydrolysis, buffer solution and multistage equilibria in polyelectrolyte system.

**Paper Code: CHE-HC-2016**

**Paper Title: ORGANIC CHEMISTRY-I**

**Course Learning Outcomes**

**CO-1**: This course introduces the basic concept of organic chemistry including reaction intermediates and introduction to the different types of organic reactions.

**CO-2**: It aids in learning the stereochemistry of chiral compounds arising due to the presence of stereo-axis and optical activity of chiral compounds.

**CO-3**: It helps to understand the chemistry of aliphatic and aromatic hydrocarbons with their different types of isomerism and to study the various reaction mechanisms of organic reactions.

**CO-4**: It helps to learn the experimental purification techniques and synthesis of organic compounds, calculation of experimental yields and determination of melting points of purified organic compounds.

**Paper Code: CHE-HC-2026**

**Paper Title: PHYSICAL CHEMISTRY-II**

**Course Learning Outcomes**

**CO-1**: This course introduces the basic concepts of thermodynamics including thermochemistry and system of variable composition.

**CO-2**: It provides the basic concepts of chemical equilibrium including its thermodynamic parameters.

**CO-3**: It introduces the study of colligative properties of solutions.

**CO-4**: It helps in learning experimental determination of heat capacity of a calorimeter, enthalpy of neutralization, ionization of acid and enthalpy of solution experimentally.

**Paper Code: CHE-HC-3016**

**Paper Title: INORGANIC CHEMISTRY-II**

**Course Learning Outcomes**

**CO-1**: This course introduces the general principles of metallurgy, extraction and refining methods of different metals.

**CO-2**: It introduces the chemistry of s and p-block elements, noble gas elements and their compounds along with acid base theory.

**CO-3**: It provides a deep understanding of the chemistry of inorganic polymers and comparative study with organic polymers.

**CO-4**: It helps to gain the basic understandings of iodometric and iodimetric titrations experimentally and inorganic preparations.

**Paper Code: CHE-HC-3026**

**Paper Title: ORGANIC CHEMISTRY-II**

**Course Learning Outcomes**

**CO-1**: This course introduces in details the chemistry of halogenated hydrocarbons, synthesis and specific reactions.

**CO-2**: It provides a detailed study of the chemistry of alcohols, phenols, ethers and epoxides, carbonyl compounds, carboxylic acids and their derivatives along with preparations, properties and specific reactions.

**CO-3**: It helps to study the preliminary reactions and synthesis of Sulphur containing compounds.

**CO-4**: It provides an introduction to the determination of the presence of different organic functional groups in compounds experimentally and preparations of organic compounds.

**Paper Code: CHE-HC-3036**

**Paper Title: PHYSICAL CHEMISTRY-III**

**Course Learning Outcomes**

**CO-1**: This course introduces in details the basic concepts of phase equilibria.

**CO-2**: It provides the basic concepts of chemical kinetics of various types of reactions.

**CO-3**: It helps to study the catalysis process, properties and function of catalysts and surface chemistry.

**CO-4**: It helps to study experimentally the kinetics of chemical reactions.

**Paper Code: CHE-SE-3034**

**Paper Title: BASIC ANALYTICAL CHEMISTRY (SEC)**

**Course Learning Outcomes**

**CO-1**: This course provides the concept of analytical chemistry, its interdisciplinary nature, and different micro and semi micro analytical techniques.

**CO-2**: It helps to develop the ability to use modern instrumental methods for chemical analysis of food, soil, air, water and cosmetics.

**CO-3**: It helps to learn the basic working principle of chromatography.

**CO-4**: It provides skill to the usage of theoretical knowledge in practical fields with project works.

**Paper Code: CHE-HC-4016**

**Paper Title: INORGANIC CHEMISTRY-III**

**Course Learning Outcomes**

**CO-1:** This course introduces the chemistry of coordination compounds, with various aspects like nomenclature, theories of structure and bonding, varieties and reactivities of the coordination compounds.

**CO-2:** It provides the study of the transition elements and inner transition elements with their various aspects.

**CO-3:** It provides the basic concepts of bioinorganic chemistry, applications and harmful effects of metals in biological systems.

**CO-4:** It helps to gain experimental experience in gravimetric estimation of metal ions and preparation of some inorganic complexes.

**Paper Code: CHE-HC-4026**

**Paper Title: ORGANIC CHEMISTRY-III**

**Course Learning Outcomes**

**CO-1:** This course introduces the chemistry of different nitrogen-containing compounds, alkaloids and terpenoids, their potential applications, structures, synthesis and reactivities.

**CO-2:** It provides the study of the chemistry of different polynuclear hydrocarbons

**CO-3:** It provides the study of the chemistry of heterocyclic compounds with their structures and reactions.

**CO-4:** It helps to gain experimental experience in the detection of important elements like nitrogen and sulphur and functional groups in organic compounds.

**Paper Code: CHE-HC-4036**

**Paper Title: PHYSICAL CHEMISTRY-IV**

**Course Learning Outcomes**

**CO-1**: This course introduces the basic concepts of electrochemistry.

**CO-2**: It introduces the basic concepts of conductance.

**CO-3**: It helps to study electrical and magnetic properties of atoms and molecules.

**CO-4**: It provides experimental knowledge in the determination of cell constant, equivalent conductance, its application and potentiometric titrations.

**Paper Code: CHE-SE-4064**

**Paper Title: FUEL CHEMISTRY (SEC)**

**Course Learning Outcomes**

**CO-1**: This course introduces the concept of renewable and non-renewable energy sources, classification of fuels and calorific value.

**CO-2**: It provides an idea on the composition of coal and petroleum products, their extraction, purification methods and usage.

**CO-3**: It provides an idea on the classifications and applications of natural and synthetic lubricants.

**CO-4**: It aids in learning the determination and significance of various industrially relevant physical parameters for different fuels and lubricants.

**Paper Code: CHE-HC-5016**

**Paper Title: ORGANIC CHEMISTRY-IV**

**Course Learning Outcomes**

**CO-1:** This course introduces the chemistry of significant biomolecules such as nucleic acids, amino acids, enzymes and lipids.

**CO-2:** It gives an idea study the concept of energy in biosystems.

**CO-3:** It introduces the chemistry of different pharmaceutical compounds.

**CO-4:** It allows to learn basic experimentation techniques for the determination of some biological entities like glycine, protein, salivary amylase and DNA.

**Paper Code: CHE-HC-5026**

**Paper Title: PHYSICAL CHEMISTRY-V**

**Course Learning Outcomes**

**CO-1:** It introduces the concept of quantum chemistry, the postulates of quantum mechanics and the application of quantum mechanical ideas in some simple systems such as particle in a box, rigid rotator and simple harmonic oscillator.

**CO-2:** It introduces the concept of spectroscopy viz. rotational, vibrational, Raman, electronic, spin resonance and electronic spectroscopy.

**CO-3:** It introduces the different concepts of photochemistry.

**CO-4:** It allows to develop deep learning on UV/Visible spectroscopy and colorimetric experiments.

**Paper Code: CHE-HE-5026**

**Paper Title: ANALYTICAL METHODS IN CHEMISTRY (DSE 1)**

**Course Learning Outcomes**

**CO-1**: This course helps to learn more about the qualitative/quantitative aspects of analysis.

**CO-2**: It helps to understand the various separation techniques.

**CO-3**: It covers some of the widely used instrumental techniques for characterization of samples.

**CO-4**: It familiarizes the users with different experiments using instrumental techniques and chemical analysis.

**Paper Code: CHE-HE-5046**

**Paper Title: NOVEL INORGANIC SOLIDS (DSE 2)**

**Course Learning Outcomes**

**CO-1**: This course introduces the synthesis and modifications of inorganic solids and their technological importance.

**CO-2**: It throws an overview of nanostructures and nanomaterials, preparation, classification, control of self-assembly and use of nanomaterials as bio-nanocomposite, nanotube, nanowire and other bio-functional materials.

**CO-3**: It helps to learn the engineering materials especially composite materials for mechanical construction and manufacturing, properties, classification and application of conducting polymer materials.

**CO-4**: It introduces an idea on the different types of composite materials and their applications.



**Paper Code: CHE-HC-6016**

**Paper Title: INORGANIC CHEMISTRY-IV**

**Course Learning Outcomes**

**CO-1:** This course gives an introduction to inorganic reactions, the kinetic and thermodynamic factors governing the reaction path, stability of inorganic compounds and mechanisms of inorganic reactions.

**CO-2:** It introduces the concept of organometallic chemistry and the importance of transition metal complexes and their applications as catalysts.

**CO-3:** It gives an idea about the differential reactivity under different condition of pH and the factors leading to stability of organometallic compounds, their synthesis, reactivity and uses.

**CO-4:** It allows to study experimentally the qualitative detection of unknown radicals and insoluble materials in a mixture and preparation of different coordination compounds.

**Paper Code: CHE-HC-6026**

**Paper Title: ORGANIC CHEMISTRY-V**

**Course Learning Outcomes**

**CO-1:** This course introduces molecular spectroscopy in details.

**CO-2:** It helps to understand carbohydrates in details including monosaccharides, disaccharides and polysaccharides and their reactions.

**CO-3:** It introduces the details of different types of dyes, polymers and polymerization reactions.

**CO-4:** It aims to give an experimental idea about the synthesis and extraction of polymers from raw materials and identification of organic compounds by spectroscopy.

**Paper Code: CHE-HE-6026**

**Paper Title: INDUSTRIAL CHEMICALS AND ENVIRONMENT**

**Course Learning Outcomes**

**CO-1**: This course provides an introduction to the various industrial gases and inorganic chemicals, their manufacturing processes, applications, storage and the hazards of handling them.

**CO-2**: It allows to study the involvement of industrial chemicals in air and water pollution and their effects on living organisms and the environment.

**CO-3**: It introduces the concept of biocatalysis and their importance in green chemistry and chemical industry.

**CO-4**: It gives an experimental idea about the determination of different particles and gases in air and water.

**Paper Code: CHE-HE-6056**

**Paper Title: DISSERTATION**

**Course Learning Outcomes**

**CO-1**: This course helps to learn how to carry out a project work.

**CO-2**: It helps to write a review article on a particular field/topic as assigned by the teacher.

**CO-3**: It helps to prepare a presentation and to present before a panel of experts as set by the institution.

**Paper Code: CHE**

**Paper Title: CHEMISTRY I**

**Course Learning Outcomes**

**CO-1**: This course helps to learn about the basic component of an atom.

**CO-2**: It helps to learn how electron occupy orbitals for atom.

**CO-3**: It helps to learn the bonding characteristics of molecules through different types of sharing of electrons between the orbitals.

**CO-4**: It helps to learn the structure of atoms and molecules in 3D space.

**CO-5**: It helps to learn various phenomenon related to gaseous and liquid state of matter.

**CO-6**: This course also helps students to learn about the basic setups of laboratory.

**Paper Code: CHE**

**Paper Title: CHEMISTRY II**

**Course Learning Outcomes**

**CO-1**: This course helps to learn about concept of aromaticity in organic compounds.

**CO-2**: It helps to learn about the colligative properties of solutions.

**CO-3**: It helps to learn about the preparation of various functional group and possible applications.

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