

B.Sc. Chemistry Revised Syllabus under CBCS**w.e.f. 2020-21****Structure of Chemistry Core Syllabus under CBCS**

YEAR	SEMESTER	COURSE	TITLE	MARKS	CREDITS
I	I	I	Inorganic and Physical Chemistry	100	3
	I	I	Practical – I Analysis of SALT MIXTURE	50	2
	II	II	Organic and General Chemistry	100	3
	II	II	Practical – II Volumetric Analysis	50	2
II	III	III	Organic Chemistry and Spectroscopy	100	3
	III	III	Practical – III Organic preparations and IR Spectral Analysis	50	2
	IV	IV	Inorganic, Organic and Physical Chemistry	100	3
	IV	IV	Practical – IV Organic Qualitative analysis	50	2
	IV	IV	Inorganic and Physical Chemistry	100	3
	IV	IV	Practical-V Course Conductometric and Potentiometric Titrimetry	50	2

SEMESTER – I

Name of the Course: INORGANIC AND PHYSICAL CHEMISTRY

Course Code: 1003CHE20

Paper: I

Course Outcomes

S. No	Course outcomes
CO-1	Understand the preparation and structures of the 13, 14, 15, 16 and 17 group elements.
CO-2	Study the Characteristic properties of d-block and f -block elements. Understand different theories of metal bonding.
CO-3	Learn about solid state compounds, and also give detailed explanation of Symmetry in crystals, the law of symmetry, crystal systems, X-ray diffraction and understand defects in crystals.
CO-4	Explain the difference between solid, liquid, and gases in terms of intermolecular interactions. Understand important laws and characteristic properties of gases and liquids.
CO-5	Learn about Non-ideal solutions, different types solutions, Nernst distribution law and applications. Study about colligative properties like Raoult's law, Elevation of boiling point, depression of freezing point, and osmotic pressure. Understanding abnormal Colligative properties- Van't Hoff factor.

SEMESTER – I

Name of the Course: Practical – I Analysis of SALT MIXTURE

Course Code: 1003CHE20PE

Paper: LABORATORY COURSE-I

Course Outcomes

S. No	Course outcomes
CO-1	Understand the basic concepts of qualitative analysis of inorganic mixture
CO-2	Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
CO-3	Apply the concepts of common ion effect, solubility product and concepts related to qualitative analysis

SEMESTER – II

Name of the Course: ORGANIC AND GENERAL CHEMISTRY

Course Code: 2003CHE20

Paper: II

Course Outcomes

S. No	Course outcomes
CO-1	Study General methods of preparation, physical and chemical properties of Alkanes and Cycloalkanes.
CO-2	Study General methods of preparation, physical and chemical properties of alkenes and alkynes.
CO-3	Understand the concept of aromaticity and Huckel rule. Learn and identify electrophilic substitution reactions in benzene compounds.
CO-4	Learn about basic principles of surface chemistry, study the different types of adsorption, theories and applications. Explain VB and MO theories for simple molecules. Learn about HSAB principle and types.
CO-5	Learn about stereochemical aspects of Molecular representations, Optical activity, enantiomers, and diastereomers. Explain D,L and R,S configuration methods and E,Z- configuration with examples.

SEMESTER – II

Name of the Course: PRACTICAL – II VOLUMETRIC ANALYSIS

Course Code: 2003CHE20PE

Paper: LABORATORY COURSE-II

Course Outcomes

S. No	Course outcomes
CO-1	Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
CO-2	Understand and explain the volumetric analysis based on fundamental concepts learned in ionic equilibria.
CO-3	Learn and identify the concepts of standard solutions, and primary and secondary standards.
CO-4	Facilitate the learner to make solutions of various molar concentrations. This may include: The concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations.

SEMESTER – III

Name of the Course: INORGANIC AND PHYSICAL CHEMISTRY

Course Code: 3003CHE20

Paper: III

Course Outcomes

S. No	Course outcomes
CO-1	Learn about the preparation and physical and chemical reactions of halo and hydroxyl compounds. Understand the mechanism of organic reactions in halogenated hydrocarbons and hydroxy compounds. Students will develop the thinking skills related to the organic reaction mechanism
CO-2	Study the preparation, physical, and chemical properties of aldehydes and ketones. Understand the important named reactions of Carbonyl compounds and their mechanisms.
CO-3	Learn about the Nomenclature, classification, structure, and chemical properties of carboxylic acids and their derivatives. Understand preparation methods, chemical properties, and reaction mechanism of carboxylic acids and their derivatives.
CO-4	Understand principles, concepts, and applications of Rotational, Vibrational, Electronic, and Nuclear Magnetic Resonance (NMR) spectroscopy
CO-5	Understand the Application of visible, ultraviolet and Infrared spectroscopy in organic molecules. Calculate λ_{max} of conjugated dienes and α, β – unsaturated compounds. Study about IR spectroscopy and analyze the IR spectra of the simple organic molecules.

SEMESTER – III

Name of the Course: PRACTICAL – III ORGANIC PREPARATIONS AND IR SPECTRAL ANALYSIS

Course Code: 3003CHE20PE

Paper: LABORATORY COURSE-III

Course Outcomes

S. No	Course outcomes
CO-1	How to use glassware, equipment and chemicals and follow experimental procedures in the laboratory. How to calculate limiting reagent, theoretical yield, and percent yield
CO-2	How to engage in safe laboratory practices by handling laboratory glassware, equipment, and chemical reagents appropriately. How to dispose of chemicals in a safe and responsible manner.
CO-3	How to perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration. How to create and carry out work up and separation procedures.
CO-4	How to critically evaluate data collected to determine the identity, purity, and percent yield of products and to summarize findings in writing in a clear and concise manner

SEMESTER – IV

Name of the Course: (INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY)

Course Code: 4003CHE20-A

Paper: IV

Course Outcomes

S. No	Course outcomes
CO-1	Understanding the structure of mono and poly nuclear carbonyls, Concept of hapticity Organic ligands and general methods of preparation of mono and poly nuclear carbonyls of 3d.
CO-2	Determination of the structures of Glucose and Fructose. Understanding interconversions of Aldoses and Ketoses. Analysis of structures of Disaccharides and Polysaccharides.
CO-3	To study the classification, preparation methods and properties of Aminoacids. To study the preparation methods and properties of Five and Six membered heterocyclics.
CO-4	To learn about Nomenclature, Classification, Properties and properties of Nitro hydrocarbons. To understand the basicity, and separation of amines. To study the preparation and properties of amines and diazonium salts.
CO-5	To understand the laws of photochemistry and quantum yield. Analysis low and high quantum photochemical reactions and Jablonski diagram. To understand the laws thermodynamics and their applications.

SEMESTER – IV

Name of the Course: ORGANIC QUALITATIVE ANALYSIS LAB

Course Code: 4003CHE20-A-PE

Paper: LABORATORY COURSE-IV

Course Outcomes

S. No	Course outcomes
CO-1	Use glassware, equipment and chemicals and follow experimental procedures in the laboratory.
CO-2	Determine melting and boiling points of organic compounds
CO-3	Understand Application of concepts of different organic reactions studied in theory part of organic chemistry

SEMESTER – IV

Name of the Course: (INORGANIC, AND PHYSICAL CHEMISTRY)

Course Code: 4003CHE20-B

Paper: V

Course Outcomes

S. No	Course outcomes
CO-1	Understand the theories of the complex compounds. Learn about the isomerism in Coordination compounds.
CO-2	Study about the reaction mechanism of the metal complexes. Understand the stability of the metal complexes and determination of methods composition of metal Complexes. Learn the biological significance of metal ions. Study the structure and functions of the Haemoglobin, Myoglobin and Chlorophyll.
CO-3	Draw and analysis of phase diagrams of one and two component systems. Define terms and derivation of the phase rule.
CO-4	Identify the different electrolyte and conductivities. Study different theories applicable for weak and strong electrolytes. Learn about different types of electrochemical cells and their applications. To calculate concentration of electrolytes by using conductometric and potentiometric techniques.
CO-5	To study the factors effecting rate of the reaction. Write an expression for rate constant K for Zero, first, second and third order reactions. Understand theories of the reaction rates. Study methods for enzyme catalysis reaction and derivation of Michaelis- Menten constant.

SEMESTER – IV

Name of the Course: CONDUCTOMETRIC AND POTENTIOMETRIC TITRIMETRY
LAB

Course Code: 4003CHE20-B-PE

Paper: LABORATORY COURSE-V

Course Outcomes

S. No	Course outcomes
CO-1	Use glassware, equipment and chemicals and follow experimental procedures in the laboratory.
CO-2	Apply concepts of electrochemistry in experiments
CO-3	Be familiar with electroanalytical methods and techniques in analytical chemistry which study an analyte by measuring the potential (volts) and/or current (amperes) in an electrochemical cell containing the analyte