

DEPARTMENT OF CHEMISTRY

BSc. Chemistry (Model 1)

SEMESTER 1

CH1CRT01	General and Analytical Chemistry	Credits: 2
CO1	Develop the scientific aptitude of students and critical thinking and equip them in pursuing chemistry as a career.	
CO2	Learn fundamental idea regarding the elements of chemistry and periodic properties of atoms.	
CO3	Develop scientific skills, observation and interpretation and evaluation of chemical analysis.	
CO4	To have an insight on the separation, purification and isolation of compounds.	
CO5	Enabling students to handle basic statistical tools for analyzing data.	

SEMESTER 2

CH2CRT02	Theoretical and Inorganic Chemistry	Credits: 2
CO1	Understand atomic structure, electronic configuration and various rules for the filling up of electrons.	
CO2	Explain the formation of different types of bonds and the various atom models	
CO3	Understand Molecular Orbital theory of bonding, hydrogen bonding and applications.	
CO4	Study the periodic properties of s and p block elements.	
CO5	Learn about the transition metals, lanthanides and their applications.	

SEMESTER 1&2 Practicals

CH2CRP01	Volumetric Analysis	Credits: 2
CO1	Prepare a standard solution.	
CO2	Determine the mass of substance in its solution using acidimetry and alkalimetry	
CO3	Determine the mass of substance in its solution using complexometric titrations	
CO4	Determine the mass of substance in its solution using Redox titrations	

SEMESTER 3

CH3CRT03	Organic Chemistry- I	Credits: 3
CO1	Develop basic idea about organic chemistry including naming of organic compounds and other fundamental concepts	
CO2	Various electronic displacement effects, cleavage of bonds, reagents, reactive intermediates and types of organic reactions	
CO3	Understand Optical isomerism and Geometrical isomerism with conformational analysis.	
CO4	Fundamental concepts of aromaticity- benzene, naphthalene, anthracene and aryl halides	
CO5	Introduction to pericyclic reactions with example	

SEMESTER 4

CH4CRT04	Organic Chemistry- II	Credits: 3
CO1	Discuss the chemistry of alcohols, phenols and ethers.	
CO2	Discuss the chemistry of aldehydes and ketones	
CO3	Discuss the chemistry of carboxylic acids and its derivatives	
CO4	Discuss the chemistry of sulphonic acids and its derivatives	
CO5	Discuss the different name reactions and its mechanisms	

SEMESTER 3&4 Practicals

CH4CRP02	Qualitative Organic Analysis	Credits: 2
CO1	Develop skills required for the qualitative analysis of organic compounds	
CO2	Discuss the preparation of different organic compounds	
CO3	Examine the boiling points and melting points of organic compounds	

SEMESTER 5

CH5CRT05	Environmental Studies and Human Rights	Credits: 4
CO1	Understand the multifaceted nature of environmental studies and become aware of the various resources and how to handle them effectively	
CO2	Recognize the harmful effects of pollution, find solutions to the problems and to become a socially responsible person.	
CO3	Get awareness about ecological stress posed upon ecosystems by the presence of chemicals	
CO4	Understand the very fact human rights system	
CO5	Understand the human rights advocacy	

CH5CRT06	Organic Chemistry- III	Credits: 3
CO1	Study the preparation and reactions of various nitrogen containing aromatic compounds like aromatic and aliphatic amines diazonium salts.	
CO2	Study the preparation and reactions of various nitrogen containing aliphatic amines diazonium salts compounds.	
CO3	Learn the various heterocyclic compounds and their synthetic applications	
CO4	Learn preparation and reactions of active methylene compounds used in the synthesis of various industrially significant compounds	
CO5	Study the structure, reactivity and biological importance of carbohydrates	

CH5CRT07	Physical Chemistry- I	Credits: 2
CO1	Examine kinetic theory of gases	
CO2	Discuss the application of kinetic gas equation	
CO3	Discuss about Maxwell distribution of molecular velocities	
CO4	Describe the intermolecular forces in gases, liquids and solids.	
CO5	Discuss on crystallography	

CH5CRT08	Physical Chemistry- II	Credits: 3
CO1	Learn fundamentals of classical and quantum mechanics.	
CO2	Understand the applications of quantum mechanics to various systems	
CO3	Study valence bond and molecular orbital theory	
CO4	Study the principle and applications of microwave, IR, NMR, ESR and Raman spectroscopy	
CO5	Get the ability to identify organic compounds by analysis and interpretation of spectral data	

CH5OPT01	Open Course : Chemistry in Everyday Life	Credits: 3
CO1	Understand the different classes of food additives like preservatives, flavours, sweeteners, emulsifying agents, antioxidants and leavening agents.	
CO2	Detailed study of Soaps and detergents, their differences in action and environmental impact	
CO3	Study of cosmetics to get an awareness about the damages that cosmetics can do to human body.	
CO4	Introduction about plastics, paper and dyes and the environmental aspects of their uses.	
CO5	Detailed study of classification of drugs, structure, their therapeutic uses, and mode of action and abuse.	

SEMESTER 6

CH6CRT09	Inorganic Chemistry	Credits: 3
CO1	Understand the classification and structural aspects of coordination compounds	
CO2	Study Crystal field theory and enable the students to interpret the splitting pattern of tetrahedral complexes.	
CO3	Study Crystal field theory and enable the students to interpret the splitting pattern of octahedral complexes.	
CO4	Learn S_N1 and S_N2 reactions and their mechanisms	
CO5	Understand the classification, properties and applications of organometallic compounds	

CH6CRT10	Organic Chemistry- IV	Credits: 3
CO1	Learn in detail the chemistry of natural products like terpenoids and alkaloids	
CO2	Study the chemistry and mode of action of soaps and detergents	
CO3	Study the fundamentals of fats and oils, vitamins, lipids, hormones and steroids	
CO4	Understand the structure and functions of enzymes, amino acids, proteins and nucleic acids	
CO5	Study the fundamentals of rotational, vibrational and mass spectrometry	

CH6CRT11	Physical Chemistry- III	Credits: 3
CO1	Understand basic concepts of thermodynamics	
CO2	Learn first law, second law and third law in detail	
CO3	Study Law of mass action and chemical equilibria	

CO4	Equipped in predicting the direction of a chemical reaction
CO5	Detailed study of ionic equilibrium, Buffer solutions, its mode of action

CH6CRT12	Physical Chemistry- IV	Credits: 3
CO1	Understand the mechanism of electrical conductance, theories of electrical conductance, and conductometric titrations	
CO2	Design different types of electro chemical cell and able to calculate its potential	
CO3	Familiarise with electro analytical methods and corrosion of metals.	
CO4	Understand basic principles of photochemistry	
CO5	Understand basic principles of group theory	

CH6CBT01	Elective : Polymer Chemistry	Credits: 3
CO1	Classify polymers and explain the configuration of polymers and properties like glass transition temperature and melting point of polymers	
CO2	Illustrate the preparation, properties and applications of polymers	
CO3	Interpret the mechanism of polymerization	
CO4	Acquaint various polymer processing technologies and explain thermal methods of analysis of polymers	
CO5	Know the recent advances in polymer chemistry	

SEMESTER 5&6 Practicals

CH6CRP03	Qualitative Inorganic Analysis	Credits: 2
CO1	Apply the theoretical concepts while performing experiments	
CO2	Acquire practical skill to analyse the anions and cations qualitatively present in a mixture of inorganic salts	
CO3	Acquire practical skill to analyse the anions and cations qualitatively present in a mixture of inorganic salts	
CO4	Able to design, carry out, record and analyze the results of chemical experiments	
CO5	Learns the effective usage of chemicals	

CH6CRP04	Organic Preparations and Laboratory Techniques	Credits: 2
CO1	Apply the theoretical concepts while performing experiments	
CO2	Acquire practical skill in preparing organic compounds and in their purification by crystallisation	
CO3	Acquire the habit of working safely with the chemicals and handling of equipment	

CO4	Chromatographic techniques will enable the students to develop the skills to purify impure organic compounds.
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CH6CRP05	Physical Chemistry Practicals	Credits: 2
CO1	Acquire practical skill in physical chemistry experiments such as Cryoscopy, Transition Experiments, Phase Rule Experiments, Conductometric titrations , Potentiometric titrations , colorimetry and Chemical Kinetics	
CO2	Able to carry out and record these experiments in a skillful manner	

CH6CRP06	Gravimetric Analysis.	Credits: 2
CO1	Make use of standardised procedures for the Gravimetric analysis	
CO2	Learn the skills of Precipitation process, digestion, filtration, incineration etc	
CO3	Able to design, carry out, record and analyze the results of chemical experiments	