Course Outcomes

Chemistry

FIRST YEAR / SEMESTER I
Paper 1: Inorganic & Organic Chemistry

CO1. After learning 'P- block elements', students are expected to recall the various definitions, concepts related to them and apply these concepts as and when required. Realize the industrial significance of these elements and their compounds. Also, their applications in our daily.

CO2. After the completion of 'Organometallic chemistry', students should be able to realize the potential applications of these compounds in the synthesis of various chemicals and polymers of day today use both at laboratory level in micro scale and industrially in macro scale.

CO3. After learning 'Structural theory in organic chemistry', students are expected to be well versed with all the fundamental concepts of organic chemistry such as bond fission, inductive effect, mesomeric effect, hyperconjugation etc. Also, explanation for acidity and basicity based on these concepts.

CO4. After going through 'Acyclic hydrocarbons' and 'Alicyclic hydrocarbons', students are expected to know the differences between them, methods of synthesis, chemical properties, various types of strains involved in the cyclic hydrocarbons and their effect on their geometry and chemical properties, theories of strain such as Bayer's theory.

CO5. After going through 'Benzene and its reactivity', students are to be in a position to apply the concept of resonance in explaining different phenomena such as acidity, basicity of acids, phenols and amines. Also, they are expected to be in a position to explain the preference of electrophilic and nucleophilic substitutions for ortho, para or meta positions.

CO6. Students must have developed personality traits such as Punctuality, faithfulness, honest recording of scientific data and self– confidence.

FIRST YEAR / SEMESTER II
Paper 2. Physical & General Chemistry

CO1. Students will apply the concepts of the topic in various scientific situations, say, conductivity of crystals due to crystal defects etc.

CO2. Students differentiates the real and ideal gases and will be in a position to explain why only real gases show Joule Thomson effect and why only real gases can be liquified.

CO3. Learning 'Liquid state' makes them aware of classification of liquid crystals and will be in a position to explain the functioning of LCD.

CO4. Learning 'Solutions' will not only make the students aware of all the fundamental concepts of it, but also bring the familiarity of its applications such as isotonic solutions, azeotropic mixtures etc.

CO5. After learning 'Surface chemistry' students will have clear idea of all the concepts and will be in a position to apply the concepts in explaining water purification methods, colloidal medicines etc.

CO6. Learning the chemical bonding would empower the student to explain most of the chemical phenomena in daily life.

CO7. Understanding 'Stereochemistry' will make the students to appreciate how the three dimensional structure of molecules effect their chemical and physical properties. Also, they are in a position to explain the importance of stereochemistry in medicine.

CO8. Students must have developed the skills related to practicals such as safe handling of chemicals and the apparatus, recording the observations, drawing diagrams and graphs.

CO9. Students must have developed inquisitive spirit, scientific temper, rational thinking, logical interpretation of data obtained and systematic approach to solve problems.

CO10. The students must have developed personality traits such as Punctuality, faithfulness, honest recording of scientific data and self–confidence

SECOND YEAR / SEMESTER III
Paper 3. INORGANIC & ORGANIC CHEMISTRY

CO1. The students could able to know the electronic configuration of d-block elements and its effect on colour and magnetic properties. Catalytic properties of d-block elements its industrial applications.

CO2. The students could able to know the conductors and semiconductors.

CO3. Calculation of EAN and its relation with stability of metal carbonyls.

CO4. Recognises the difference between d block elements and f-block elements, Lanthanide contraction and its consequences, Colour properties, Lanthanides separation.

CO5. Acquires knowledge on halogen derivatives of organic compounds, Types of organic reactions, Importance of stereochemistry in the organic reactions especially in substitution reactions.

CO6. Able to differentiate alcohols and preparative methods for alcohols and phenols.

CO7. Distinguishes between different carbonyl compounds, able to write preparation methods of carbonyl compounds, Synthetic importance of base catalysed reactions.

CO8. Names the carboxylic acids according to IUPAC, describes the acidity, write the methods of preparation and reactivity.

CO9. Able to describes the importance of carbanion in the organic synthesis, write the synthetic applications of malonic ester and acetoacetic ester.

SECOND YEAR / SEMESTER IV
Paper 4: SPECTROSCOPY & PHYSICAL CHEMISTRY

CO1. Students will able to apply Beer Lambert law for quantitative determinations.

CO2. Able to identify the type of conjugation in organic molecules and effect of conjugation on colour of the compounds.

CO3. Able to know the modes of vibrations in organic molecules.

CO4. Able to identify type of functional group present in the organic molecules.

CO5. Able to learn the magnetic behaviour of 1H and elucidation of structures of organic compounds by using 1H-NMR data.

CO6. Students could able to determine the molecular weight by using experimental determination of Colligative properties.

CO7. Student could able differentiate strong electrolytes and weak electrolytes.

CO8. Able to understand effect of dilution on conductance for strong electrolytes and weak electrolytes.

CO9. Able to determine the transport numbers. Student could able to calculate the EMF of the given cell.

CO10. Differentiate the reversible and irreversible cells. Students could able to learn the applications of phase rule in metallurgy, desilvarisation of lead.

THIRD YEAR / SEMESTER V
Paper 5, 6: INORGANIC, ORGANIC & PHYSICAL CHEMISTRY

CO1. Students able to learn the bonding in the coordinate compounds, stability, colour and magnetic properties, Learn the CFSE calculations, Isomerism in complex compounds.

CO2. Able to known the colour phenomenon and calculation of magnetic moment.

CO3. Able to know the stability and reactivity of the complexes, labile and inert complexes, Methods for determination of composition of the complexes.

CO4. Able to understand the nomenclature of nitro hydrocarbons, tautomerism in nitro hydrocarbons

CO5. Students understand the nomenclature of amines, Basicity of amines, comparison of basicity and separation of amines. Chemical properties of amines.

CO6. Able to learn the different types of thermodynamic systems, reaction energies, feasibility of the chemical reactions, entropy and its significance.

THIRD YEAR / SEMESTER VI
Paper 7: Elective Paper – VII-(B) - Environmental Chemistry

Upon completion of this course, the student will be able to:

CO1. Create the awareness about environmental problems among learners.

CO2. Impart basic knowledge about the environment and its allied problems.

CO3. Develop an attitude of concern for the environment

CO4. Motivate learner to participate in environment protection and environment improvement.

CO5. Acquire skills to help the concerned individuals in identifying and solving environmental problems.

CO6. Explain energy crisis and different aspects of sustainability.

CO7. Discuss local and global environmental issues based on the knowledge gained throughout the course

CO8. Strive to attain harmony with Nature.

THIRD YEAR / SEMESTER VI – Cluster Elective III ORGANIC
Paper 8-C1: ORGANIC SPECTROSCOPIC TECHNIQUES

Upon completion of this course, the student will be able to:

CO1. Explains the basics and working principle of UV-Visible spectroscopy, taking spectra and outline of UV spectroscopy device

CO2. Will be able to explain basic principles of IR spectroscopy, components of IR spectroscopy device, and taking spectrum of IR spectroscopy device

CO3. Will be able to explain basic principles of NMR spectroscopy, sample preparation procedure, working principles, taking spectrum and outline of NMR spectroscopy device,

CO4. Will be able to explain working basic and using of elemental analysis device, and report the results of C,H,O,S analysis in sample.

CO5. Will be able to explain basic principles of fluorescence spectroscopy, working principle, taking spectrum and outline of fluorescence spectroscopy device.

CO6. Will be able to interpret atomic absorption spectroscopy, explain basic principles of atomic absorption spectroscopy, types of atomic absorption spectrometers, working principles, taking spectrum and outline of atomic absorption spectroscopy device,

THIRD YEAR / SEMESTER VI - Cluster Elective III ORGANIC
Paper 8-C2: ADVANCED ORGANIC REACTIONS

Upon completion of this course, the student will be able to:

CO1. Able to predict the stereochemistry & mechanism of Electrophilic addition and Elimination reactions.

CO2. Able to identify aromatic, non-aromatic and anti-aromatic compounds and apply substituent and steric effects in reaction

CO3. To propose reaction mechanisms and determine NGP effects on rates of reactions

CO4. Develop hands on expertise to design and conduct the experiments independently

CO5. Able to write conformations of different compounds and identify their stabilities and reactivity's

CO6. To identify intermediates formed in given reaction and able to write mechanisms for molecular Rearrangements

THIRD YEAR / SEMESTER VI - Cluster Elective III ORGANIC
Paper 8-C3: PHARMACEUTICAL AND MEDICINAL CHEMISTRY

Upon completion of this course, the student will be able to:

CO1. Write the reaction, name the reaction and orientation of reactions

CO2. Account for reactivity/stability of compounds

CO3. Identify/confirm the identification of organic compound