B.Sc. CHEMISTRY

PROGRAMME OUTCOME

PO-1 Build up intellectual, organisational and personal skills by critical thinking

PO-2 Strengthen communication skills

PO-3 Acquire self-directed and life-long learning for future career perspectives

PO-4 Develop ethical and moral values

PO-5 Attain effective problem solving ability

PO-6 Understand the issues of environment and work for sustainable development

PROGRAMME SPECIFIC OUTCOME

PSO-1: Understand the basic concepts of different branches of chemistry (Inorganic, Organic and Physical)

PSO-2: Develop problem solving skills in the areas of thermodynamics, spectroscopy and electrochemistry

PSO-3: Apply the skills acquired in designing experiments for the analysis of organic and inorganic compounds

PSO-4: Improve mental stability, memory power and intellectual capacity by thermodynamic derivations and calculations

PSO-5: Create general awareness on various aspects of environmental chemistry with special focus on the current issues.

PSO-6: Provide basic idea of influence of chemistry in day-to-day life activities

PSO-7: Generate awareness in the recent trends in nanochemistry and create interest in the emerging research areas.

COURSE OUTCOME OF CORE COURSES IN CHEMISTRY (THEORY)

Semester I

Course Code and Course Title - CH1CRT01 - GENERAL AND ANALYTICAL CHEMISTRY

CO-1: Provide an introduction about the history of chemistry

CO-2: Give detailed learning in long form periodic table

CO-3: Contributes a theoretical background on volumetric analysis

CO-4: Detailed description about different separation and purification techniques used in laboratory

CO-5: Empower the students to acquire knowledge in chromatographic techniques.

CO-6: Analyse the methods to evaluate an analytical data

Semester II

Course Code and Course Title – CH2CRT02 – THEORETICAL AND INORGANIC CHEMISTRY

CO-1: Provide an introduction to the historic development of atom and atom models

CO-2: Understand the different types of bonds in molecules

CO-3: Provide detailed learning in geometry and shape of the molecule.

CO-4: Understand the characteristic properties of metals

CO-5: Analyse the periodicity in s and p block elements

CO-6: Compare the properties of elements in first transition series with that of second and third transition series

Semester III

Course Code and Course Title - CH3CRT03 - ORGANIC CHEMISTRY I

CO-1: Create a basic idea about organic compounds, nomenclature, reactions and fundamentals of organic reaction mechanisms.

CO-2: Introduce the recent advances in organic chemistry and inculcate interest in the subject.

CO-3: Understand the aromaticity and stereochemical aspect of organic compounds.

CO-4: Create awareness about the fundamental aspect of pericyclic reactions.

Semester IV

Course Code and Course Title - CH4CRT04 - ORGANIC CHEMISTRY II

CO-1: Familiarize various classes of organic compounds and their synthesis, physical properties, chemical properties and applications.

CO-2: Understand and study reaction mechanisms of carboxylic acid, alcohols, phenols, ethers, aldehydes, ketones and sulphonic acids.

Semester V

Course Code and Course Title - CH5CRT05 –ENVIRONMENTAL STUDIES AND HUMAN RIGHTS

CO-1: Understand the types of natural resources including forest, mineral, food and energy resources

CO-2: Develop basic ideas of ecosystem and green chemistry

CO-3: Identify the causes of air, water and soil pollution

CO-4: Explain the effect of toxic chemicals on environment

CO-5: Introduce the concepts of human rights

CO-6: Understand the effect of nuclear chemicals on environment

Course Code and Course Title - CH5CRT06 –ORGANIC CHEMISTRY-III

CO-1: Understand the preparation and reactions of nitrogen containing compounds

CO-2: Develop basic ideas of drugs and dyes

CO-3: Identify the classifications of polymers and environmental hazards of polymers

CO-4: Explain the classification, reactions and synthesis of heterocyclic compounds

CO-5: Understand the aspects of active methylene compounds

CO-6: Understand the types of carbohydrates and their structure

Course Code and Course Title - CH5CRT07 – PHYSICAL CHEMISTRY-I

CO-1: Able to identify all the properties of solids, liquids and gases

CO-2: Helps to understand the heat energy change and the speed of the particles during melting, condensation, boiling and freezing

CO-3: Understand the adsorption behaviour of gases

CO-4: Analyse the symmetry elements and symmetry operations in molecules

CO-5: Recognize the defects in solids.

Course Code and Course Title - CH5CRT08 – PHYSICAL CHEMISTRY-II

CO-1: Understand the basic concepts of quantum mechanics - postulates, wave function and operators

CO-2: Solve Schrodinger equation for energy of particle in 1D-box

CO-3: Understand the principles of spectroscopic techniques

CO-4: Understand the theory and selection rules of rotational, vibrational, Raman and NMR spectroscopy

OPEN COURSE

Course Code and Course Title - CH5OPT01 - CHEMISTRY IN EVERYDAY LIFE

CO-1: Inscribe chemical literacy by introducing the basic usefulness of Chemistry in everyday life.

CO-2: Create curiosity about chemical sciences and help to understand the benefits and hazards of this world.

CO-3: Able to make reasonable choices and judgments in social issues and consumer products involving chemicals

Semester VI

Course Code and Course Title - CH6CRT09 –INORGANIC CHEMISTRY

CO-1: Understand the types, theories of bonding, spectral and magnetic properties of coordination complexes

CO-2: Develop basic ideas on the preparation, properties and structure of boron compounds noble gas and inter-halogen compounds

CO-3: Identify the role and importance of elements, haemoglobin, myoglobin, chlorophyll and cytochromes in biological systems

Course Code and Course Title - CH6CRT10 –ORGANIC CHEMISTRY-IV

CO-1: Understand the classification, types, reactions and functions of terpenoids, alkaloids and lipids

CO-2: Develop elementary idea on supramolecular chemistry and mass spectrometry

CO-3: Identify organic compounds by UV, IR, NMR spectroscopic techniques

CO-4: Explain the classification, and functions of vitamins, steroids, hormones and nucleic acids

CO-5: Understand the functions and structure of nucleic acids, amino acids, proteins and enzymes

Course Code and Course Title - CH6CRT11 – PHYSICAL CHEMISTRY-III

CO-1: Understand the mathematical foundations of thermodynamics

CO-2: Explain the concepts of enthalpy, entropy and other thermodynamic processes

CO-3: Draw phase diagrams of two –component and three –component systems

CO-4: Calculate ionic strength and degree of ionization

CO-5: Apply Henderson equation for determining degree of dissociation

CO-6: Understand the concepts of chemical kinetics and catalysis

Course Code and Course Title - CH6CRT12 – PHYSICAL CHEMISTRY-IV

CO-1: Study the behaviour of binary liquid mixtures, CST, azeotropes and colligative properties

CO-2: Explain solubility of gases in liquids and laws relating solubility

CO-3: Study various electrochemical phenomenon, electrochemical cells and their applications

CO-4: Acquire basic knowledge about photochemical reactions and their mechanisms

CO-5: Introduce elements of symmetry and determination of point groups in group theory

CHOICE BASED COURSE

Course Code and Course Title - CH6CBT02 – NANO CHEMISTRY AND NANOTECHNOLOGY

CO-1: Understand the basic concepts of nanochemistry

CO-2: Describe the methods of characterization of nanomaterials

CO-3: Summarise the optical and electrical properties of nanomaterials

CO-4: Understand comprehensively the applications of nanomaterials in various fields

COURSE OUTCOME OF CORE COURSES IN CHEMISTRY (PRACTICALS)

CH2CRP01 – VOLUMETRIC ANALYSIS

CO-1Acquire skills for volumetric analysis

CH2CRP02 – QUALITATIVE ORGANIC ANALYSIS

CO-1 Develop skills for qualitative organic analysis

CO-2 Create awareness about the physical and chemical properties of various classes of organic compounds by qualitative analysis

CH6CRP03 – QUALITATIVE INORGANIC ANALYSIS

CO-1: Understand the basic principles employed in the qualitative analysis of inorganic compounds by semi micro method

CO-2: Apply the basic principles of inorganic analysis for the systematic analysis of inorganic compounds

CH6CRP04 –ORGANIC PREPARATIONS AND LABORATORY TECHNIQUES

CO-1: Develop analytical skills for preparation of organic compounds, TLC and distillation

CH6CRP05 –PHYSICAL CHEMISTRY PRACTICALS

CO-1 Develop skills in doing experiments in kinetics, conductometry, potentiometry and phase rule.

CO-2 Improve mathematical calculation skills

CO-3 Analysis of experimental data using spreadsheet program.

CH6CRP06 –GRAVIMETRIC ANALYSIS

CO-1 Develop skills in accurate and precise analysis of metal ions using gravimetric method