DEPARTMENT OF CHEMISTRY

Programme outcomes: B.Sc Chemistry

Department of Chemistry	After successful completion of B.Sc degree in Chemistry a student should be able to
Programme outcomes	**PO-1.** Gained the theoretical as well as practical knowledge of handling chemicals. **PO-2**. Afford a broad foundation in chemistry that stresses scientific reasoning and analytical problem solving with a molecular perspective.. **PO-3**. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions. **PO-4**. Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community. **PO-5**. Achieve the skills required to succeed in graduate school, professional school and the chemical industries..
Programme Specific outcomes	**PSO-1**. Gain the knowledge of Chemistry through theory and practical's. **PSO-2**. To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions. **PSO-3**. Understand the importance of the elements in the periodic table including their physical and chemical nature and role in the daily life.. **PSO-4**. Understand the concept of chemistry to inter relate and interact to the other subject like mathematics, physics, biological science etc. **PSO-5**. Understand good laboratory practices and safety. **PSO-6**. Learn the laboratory skills and safely to transfer and interpret knowledge entirely in the working environment. **PSO-7**.Make aware and handle the sophisticated instruments/equipments.
Programme Course outcome	
GENERAL CHEMISTRY-I 16SCCCH1	PCO1: Learn the Periodic properties of Elements. PCO2: Understand the theoretical aspects of qualitative and quantitative analyses PCO3: Understand the basics of alkane, reaction intermediates, and mechanisms PCO4: Learn the chemistry of cycloalkanes, alkenes, and alkynes PCO5: Understand about the preparation and properties of sols, colloids and emulsion.
GENERAL CHEMISTRY-II 16SCCCH2	PCO1: Learn the principles of bonding PCO2: Understand the chemistry of S- block elements PCO3: Learn the Aromatic character of benzene type molecules PCO4: Understand the properties of atoms,

	PCO5: Understand the significance of wave functions
GENERAL CHEMISTRY-III 16SCCCH3	PCO1: Understand the chemistry of p-block elements PCO2: Understand the preparations and properties of inter halogen compounds, PCO3: Learn the arrangement of atoms in space, isomers and their nomenclature PCO4: learn about the gas laws PCO5: Understand the types ,structure and properties of solids and liquid crystal
GENERAL CHEMISTRY-IV 16SCCCH4	PCO1: Understood the general characteristics of d and f-block elements PCO2: Learn the reactions of alcohol, phenols and ethers PCO3: Grasped the fundamentals concepts of first law of thermodynamics PCO4: Get the depth knowledge about thermodynamic laws PCO5: Learn theories of reactions
Inorganic Chemistry-I-16SCCCH5	PCO1: Basic theories of coordination compounds PCO2: Understand biological importance of coordination compounds PCO3: Understand the preparation and properties of nitrosyl compounds PCO4: Get the depth knowledge of ligand field theory PCO5: Learn the factors affecting the stability of complexes
Organic Chemistry-I 16SCCCH6	PCO1: Learn the reactions of carbonyl compounds PCO2: Understand the preparations of carboxylic acids PCO3: Different types of reactions carbonyl compounds and carboxylic acids PCO4: Chemistry of nitrogen compounds PCO5: Ideas about soap preparation
Physical Chemistry-I 16SCCCH7	PCO1: Understand the basics of photochemistry and group theory PCO2: Acquire the knowledge about second law of thermodynamics, carnot cycle PCO3: Learn about the third law of thermodynamics, nearnst heat theorem PCO4: Understand the laws and properties of solutions PCO5: Acquire the knowledge about the phase rule
Analytical Chemistry-16SMBECHE1;1	PCO1: The storage and handling of chemicals PCO2: Learn data analysis, various separation technique PCO3: Understand the thermo analytical methods. The chemistry of alkaloids and terpenes PCO4: Learn the spectrophotometry and calorimetry

	PCO5: The various electroanalytical techniques
Organic Chemistry-II 16SCCCH8	PCO1: The chemistry of carbohydrates PCO2: The chemistry of proteins and vitamins PCO3: The chemistry of alkaloids and terpenes PCO4: Understand the molecular rearrangements PCO5: The spectroscopic techniques for the elucidation of structure
Physical Chemistry-II 16SCCCH9	PCO1: Acquire knowledge about the electrochemistry PCO2: Acquire knowledge about the electrochemical cells superconducting materials PCO3: Understand the basics of catalysis PCO4: Know about the adsorption isotherm PCO5: Acquire the knowledge of IR,NMR,UV-Vis and RAMAN spectroscopy
Nuclear and industrial Chemistry-II 16SMBECH2	PCO1: Acquire knowledge about the nuclear chemistry PCO2: Acquire knowledge about the nuclear chemical reactions PCO3: Understand the basics of various industrial process PCO4: Know about the water pollution PCO5: Acquire the knowledge of cement manufacturing
Polymer Chemistry 16SMBECH3:1	PCO1: Acquire knowledge about the polymers PCO2: Acquire knowledge about the reactions and properties of polymers PCO3: Understand the basics of polymerization PCO4: Know about the uses of commercial materials smart materials PCO5: Understand the concept of polymerization techniques
Volumetric analysis - 16SCCCH1P	PCO1: Titrimetry techniques PCO2: Estimation of ion PCO3: Understand the hardness of water PCO4: Knowledge about bleaching powder PCO5: The saponification of oils
Semimicro analysis - 16SCCCH2P	PCO1: About Semimicro analysis PCO2: Anions, Cations PCO3: Interfering radicals PCO4: Removal of radicals PCO5: Handling of chemicals glassware safely
Physical chemistry practical - 16SCCCH3P	PCO1: Fundamentals of conductometric titrations PCO1: Fundamentals of Potentiometric titrations PCO3: Understand the methods of determinations of mol.wt

	PCO4: Learn about the kinetics of reaction PCO5: Clear ideas about phase rule
Gravimetric and Organic Analysis - 16SCCCH4P	PCO1: Techniques of gravimetric analysis PCO2: Analysis of organic compounds PCO3: Understand the basic concepts of Gravimetric analysis PCO4: Learn simple organic preparation. PCO5: Findings of physical constants

Programme outcomes: M.Sc Chemistry

Department of Chemistry	After successful completion of M.Sc degree in Chemistry a student should be able to
Programme outcomes	**PO-1**. Gained the theoretical as well as practical knowledge of handling chemicals. **PO-2**. Afford a broad foundation in chemistry that stresses scientific reasoning and analytical problem solving with a molecular perspective.. **PO-3**. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions. **PO-4**. Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community. . **PO-5**. Achieve the skills required to succeed in graduate school, professional school and the chemical industry like cement industries, agro product, Paint industries, Rubber industries, Petrochemical industries, Food processing industries, Fertilizer industries etc.. **PO-6** Learn the laboratory skills and safely to transfer and interpret knowledge entirely in the working environment.
Programme Specific outcomes	**PSO-1**. Have sound knowledge about the fundamentals and applications of chemical and scientific theories **PSO-2**. To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions. **PSO-3**. Will become familiar with the different branches of chemistry like analytical, organic, inorganic , physical, environmental, polymer and biochemistry **PSO-4**. Understand the importance of the elements in the periodic table including their physical and chemical nature and role in the daily life.. **PSO-5**. Enormous job opportunities at all level of chemical , pharmaceutical , food products ,life oriented material industries **PSO-6.** Understand good laboratory practices and safety. **PSO-7**. Develop research oriented skills.

	PSO-8.make aware and handle the sophisticated instruments/equipments. **PSO.9**. Global level research opportunities to pursue Ph.D programme targeted approach of CSIR – NET examination
Course Outcomes	
Organic chemistry-I P16CH11	PCO1: Understand the basic concept of aromaticity PCO2: Learn the oxidation reducing reagents for organic synthesis PCO3:Stereo chemistry of organic compounds PCO4: Understand the organic photochemistry PCO5: Knowledge about Pericyclic reactions
In Organic chemistry-I P16CH12	PCO1: The basic concept of main group elements PCO2: Theories and mechanism of complexes PCO3: Theories of metal -ligand bond PCO4: Reaction mechanism of coordination complexes PCO5: The importance of inorganic photo chemistry
Physical chemistry-I P16CH13	PCO1: Understand the basics of group theory PCO2: Acquire the knowledge about quantum chemistry PCO3: Learn about the third law of thermodynamics, nearnst heat theorem PCO4: Understand the laws of kinetics and statistical thermodynamics PCO5: Acquire the knowledge about the Fast reaction, and radiation chemistry
Organic chemistry Practical -I P16CH14P	PCO1: Separation of organic mixture PCO2: Analysis of organic compounds PCO3: The organic preparation PCO4: The single stage preparation PCO5:Learn to preparation, filtration and recrystalisation
In Organic chemistry Practical-I P16CH15P	PCO1: Learn Semimicro analysis PCO2: Estimation by calorimetry PCO3: Ideas about group separation PCO4: Analysis of cations PCO5: Skill for handling and usage of chemicals and glassware's safely
In Organic chemistry-II P16CH21	PCO1: Understand the role of metal ions in biological systems PCO2: Know the basic concept of chemotherapy PCO3: Learn the principles of Organometallic PCO4: Understand the principles of medicinal bioinorganic chemistry PCO5: Reactions of Organometallic
Physical methods in chemistry-I P16CH22	PCO1: The knowledge of molecular spectroscopy PCO2: Know the Principles of NMR spectroscopy PCO3: Know the theories of UV,IR Spectroscopy PCO4 : Understand the principles of ESR,ORD,MASS spectroscopy PCO5: The knowledge about XRD
Organic chemistry Practical-II	PCO1: Acquire knowledge about Organic estimation.

P16CH23P	PCO2 : Acquire knowledge about estimation of glucose PCO3: The ideas about organic preparation PCO4: Know the two stage preparation PCO5: To get skilled for organic preparation
In Organic chemistry Practical-I I P16CH24P	PCO1: Acquire knowledge about Titrimetry analyses PCO2 : Acquire knowledge about gravimetric analyses PCO3: The ideas about separation of mixture of ions PCO4: Preparation of complexes PCO5: To get skilled for in organic preparation
Solis state chemistry-P16CH21	PCO1: Know the nano types of materials PCO2: Acquire the knowledge of crystal structure of inorganic solids PCO3: Acquire the knowledge of crystallization PCO4: Know the applications of magnetic materials PCO5: Acquire the applications of organic solids
Organic chemistry-II P16CH32	PCO1: Nucleophilic substitution reactions PCO2: Electrophilic substitution reactions PCO3: Chemistry of heterocyclic compounds PCO4: Addition elimination reactions PCO5: Chemistry of natural products
Physical chemistry-II P16CH32	PCO1: Understand quantum chemistry PCO2: Application of group theory PCO3: Understand the electro chemistry PCO4: Learn adsorption principles PCO5: Classical thermodynamics
Physical chemistry Practical P16CH33P	PCO1: Various non electrical techniques of physical chemistry PCO2: Practical skill about kinetics PCO3: Practical skill about mol.wt determination PCO4:Practical skill about phase rule PCO5: Practical skill about adsorption
Bio-Organic chemistry P16CH32	PCO1: Preparation and amino acids and proteins PCO2: Activity of enzymes and cofactors PCO3: Learn the basics of lipids and nucleic acids PCO4: Concept of bio-energetics. PCO5: Principles of lead and analogue synthesis.
Analytical chemistry-II P16CH32	PCO1: Instrumental methods PCO2: Learn data analysis, various separation technique PCO3: Understand the chromatography methods PCO4: Learn the thermo analytical methods PCO5: The various electro analytical techniques
Physical methods in chemistry-II P16CH41	PCO1: Electronic spectroscopy PCO2: IR and Raman spectroscopy PCO3: NMR spectroscopy

	PCO4: Learn EPR and magnetic spectroscopy PCO5: Mossbauer spectroscopy
Physical chemistry practical-II P16CH42P	PCO1: The knowledge about electrical experiments PCO2: Conductometric titrations of acid-alkali PCO3: Precipitation titrations PCO4: Displacement titrations PCO5: Various potentiometric titrations
Industrial chemistry - P16CHE43	PCO1: The basic ideas of an industry and industrial wastes PCO2: Understand the petroleum and petrochemicals PCO3: Understand the manufacture of cement PCO4: Principles of pulp and paper industry PCO5: Learn soaps ,detergents and perfume preparation
Chemistry of Nano science and Nano technology P16CHE5B	PCO1: Synthetic methods of nano materials PCO2: Characterisation of nano materials PCO3: Reactions of nano materials PCO4: Carbon clusters and nanon structure PCO5:Nano technology and nano devices

Programme outcomes/Programme Specific outcomes : Ph.D Chemistry

Department of Chemistry	After successful completion of The Research Programme in Chemistry a student should be able to
Programme outcomes	**PO-1**.Doctor of Philosophy, Ph.D The Doctor of Philosophy programme is designed to prepare each student to actively participate in the development and growth of the field of chemistry at all levels in the industry or in research and teaching in a university or a research organization. **PO-2**.Students can enter the PhD program either with a master's or with M.Phil degree. Research is carried out in a wide range of areas ranging from coordination chemistry, organic synthesis, Nano chemistry, analytical chemistry and environmental chemistry.. **PO-3**. Students are exposed to advanced experimental and theoretical techniques, attend national and international conferences as well as workshops and specialized schools during the program. **PO-4**. Students with a PhD degree either pursue a post-doctoral position aiming for an academic career or find employment in industrial R & D laboratories.. **PO-5**. Learn the laboratory skills and safely to transfer and interpret knowledge entirely in the working environment. **PO-6**. Enormous job opportunities at all level of chemical , pharmaceutical , food products ,life oriented material industries
Programme specific outcomes	**PSO-1**.Demonstrate in-depth knowledge of one or more sub areas of chemistry **PSO-2**.Formulate a research hypothesis based on relevant literature

	and use appropriate research methods to reach conclusions. **PSO-3**.Describe their research findings clearly in publications and presentations for both professional and lay audiences. **PSO-4.**Be competitive for appropriate positions in industry and academia (e.g., research scientist and post-doctoral fellows). **PSO-5**.Teach courses effectively in the field at the college level.