Department of Chemistry

1) To improve awareness of Chemistry subject in future life, students are interested in pursuing careers in the area of Chemistry at National & International levels.
2) To motivate the students for doing research work on new technologies & methods for chemical synthesis & their wide applications.
3) To develop the social awareness which is useful to motivate & inspire to students the Knowledge of chemistry.
4) To provide oppournities to young UG graduates to reach her highest personnel and job profiles competence.
5) This course has introduced the choice based credit system (CBSE).

Program Outcomes:

1) The goal of our B. Sc. Chemistry program is to prepare students for main careers in Chemical industry and further analytical chemist, forensic scientist etc.
2) Students are trained in practical and theoretical perfect in chemistry.
3) To study different chemical reactions and solve the problems of unknown given chemical compounds.
4) To utilize all the techniques for identification of chemical compounds, skills and instrumentation techniques newly developed.
5) To motivate and easily express effective communication skills with each other.
6) To go ahead with Teamwork.
7) To enhance the ability to analyze a problem and identify, formulae and use appropriate solution to solve the problems.

Program Specific Outcomes:

1) Analytical Expertise: Implements the chemistry knowledge for careers in analytical chemistry.
2) Successful Career: Deliver Healthcare Scientist, clinical biochemistry, forensic scientist with the help of chemistry.
3) Soft Skills: Develop leadership skills as chemical engineer and pharmacologist with effective understanding the knowledge of chemistry.
4) Continuing Chemical Awareness: With identification of chemicals in food poisoning , it is need to continue development of life-long learning

➢ The Outcomes of UG Course, B. Sc. in Chemistry

- After successful completion of three year degree program in Chemistry a Student should be able to:
- CO1: Develop ability of scientific reasoning and analytical problem solving.
- CO2: Gain knowledge of Chemistry through theory and practical.
- CO3: Understand of major concepts in all disciplines of chemistry.
- CO4: Create an awareness of the impact of chemistry on the environment, society, and development
- CO5: Explore the jobs related to chemistry in public and private sectors such as chemists, food inspector, lab technician, etc.
- CO5: Continue higher studies.

○ The Outcomes of B.Sc. I st year (Chemistry)

○ 1. The Outcomes of B. Sc. Ist year (Paper I-Physical Chemistry)

- After successful completion of course a Student should be able to:
- CO1: Learn mathematical concepts required for understanding physical chemistry.
- CO2: Learn computer, its hardware, software and operating systems.
- CO3: Understand concepts behind solid, liquid and gaseous states of matter.
- CO4: Understand colloids, macromolecules and concepts behind catalysis and its applications.

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○ 2. The Outcomes of B. Sc.Ist year (Paper II-Inorganic Chemistry)

- After successful completion of course a Student should be able to:
- CO1: Understand atomic structure, modern periodic table and periodic properties of elements.
- CO2: Understand the concept of chemical bonding
- CO3: Learn chemistry of s and p block elements and extraction and isolation of Li, Be and F_2
- CO4: Preparation, properties and structures of common compounds such as diborane, borazine, hydrazine, interhalogens and polyhalides and fluorides of xenon.
- CO5: Understand chemistry of oxyacids of B, P and S

○ 3. The Outcomes of B. Sc.Ist year (Paper III-Organic Chemistry)

- After successful completion of course a Student should be able to:
- CO1: Know structure and bonding of compounds of carbon and factors that control their reactivity such as inductive effect, resonance, hyperconjugation etc.
- CO2: Gain basic knowledge of stereochemistry of organic molecules.
- CO3: Learn chemistry of alkenes, alkynes, alkadienes, cycloalkanes, alkyl halides, Grignard's Reagent, Alcohols, ethers, carbonyl compounds, carboxylic acids and amines.
- CO4: Understand synthesis and application of active methylene compounds.

4. The Outcomes of B. Sc.Ist year (Chemistry Practical)

- After successful completion of course a Student should be able to:
- CO1: Analyse an inorganic mixture qualitatively for five radicals.
- CO2: Determine molecular weight of sulphur by Rast Method
- CO3: Study Kinetics of precipitation of sulphur from sodium thiosulphate by mineral acid and dissolution of Mg-ribbon in HCl.
- CO4: Determine the percentage composition of a given binary mixture (non-interacting systems) by viscosity and surface tension methods.
- CO5: Prepare organic compounds: Acetanilide, p-bromoacetanilide and picrates and their purification

The Outcomes of B. Sc.IInd year (Chemistry)

1. The Outcomes of B. Sc.IInd year (Paper I-Physical Chemistry)

- After successful completion of course a Student should be able to:
- CO1: Understand concepts of thermodynamics (First and second law) and thermochemistry.
- CO2: Understand Chemical and Phase Equilibrium
- CO3: Understand underlying concepts of electrochemistry, electrochemical cells, buffers and corrosion.

2. The Outcomes of B. Sc.IInd year (Paper II-Inorganic Chemistry)

- After successful completion of course a Student should be able to:
- CO1: Understand concept of electrode potential, EMF diagrams and their utility.
- CO2: Understand chemistry Transition Elements and their Coordination Compounds
- CO3: Study Non-aqueous solvents such as liquid ammonia and liquid sulphur dioxide
- CO4: Study of Lewis and HSAB concepts of acids and bases.

3. The Outcomes of B. Sc.IInd year (Paper III-Organic Chemistry)

- After successful completion of course a Student should be able to:
- CO1: Study chemistry of carbohydrates with special reference to structure and configuration of glucose and fructose.
- CO2: Understand structure and aromaticity of benzene and mechanism of electrophilic substitution reactions.
- CO3: Study different classes of aromatic compounds such as aromatic halogen, nitro, amino, diazonium salts, aromatic sulphonic acids, phenols, aldehydes and ketones, aromatic acids, polynuclear hydrocarbons, heterocyclic compounds

4. The Outcomes of B. Sc.IInd year (Chemistry Practical)

- After successful completion of course a Student should be able to:

- CO1: Know calibration of pipettes and burettes, preparation of standard solutions
- CO2: Volumetric analysis,
- CO3: Determine heat of neutralisations, enthalpy of solution, transition temperature.
- CO4: Construct phase diagram of two component system
- CO5: Identify organic compounds

The Outcomes of B. Sc.III$_{rd}$ year (Chemistry)

1. The Outcomes of B. Sc.III$_{rd}$ year (Paper I-Physical Chemistry)

- After successful completion of course a Student should be able to:
- CO1: Understand elementary Quantum Mechanics
- CO2: Understand nuclear forces, radioactivity and its applications
- CO3: Study Statistical/ Molecular Thermodynamics
- CO4: Understand Rotational, Vibrational and Electronic Spectroscopy
- CO5: Understand Photochemistry, Surface Chemistry, chemistry of dilute solutions and colligative properties.

2. The Outcomes of B. Sc.III$_{rd}$ year (Paper II- Inorganic Chemistry)

- After successful completion of course a Student should be able to:
- CO1: Study chemistry of Lanthanides and Actinides
- CO2: Understand crystal field theory for coordination compounds and their electronic spectra
- CO3: Study structure and bonding of Metal Carbonyls Metal Nitrosyls
- CO4: Get knowledge of Environmental Chemistry including environmental pollutants, Green house effect and global warming. Acid rains, Ozone layer

3. The Outcomes of B. Sc.III$_{rd}$ year (Paper III- Organic Chemistry)

- After successful completion of course a Student should be able to:
- CO1: Understand chemistry of different reaction intermediates
- CO2: Understand elimination reactions (E1, E2 and E1CB mechanisms), Selected Molecular rearrangements and important name reactions
- CO3: Study Chemistry of common Polymers and Dyes
- CO4: Study Polynuclear hydrocarbons such as Anthracene and Phenanthrene
- CO5: Study chemistry of quinoline, isoquinoline and indole.
- CO6: Gain knowledge about amino acids, peptides and proteins.

4. The Outcomes of B. Sc.III$_{rd}$ year (Paper IV- Analytical Chemistry)

- After successful completion of course a Student should be able to:
- CO1: Get knowledge about various topics of analytical chemistry such as Errors and Evaluation of measurements, Volumetric analysis, Gravimetric analysis and Separation techniques
- CO2: Study important topics of biological chemistry such as Biological Membranes, Nucleic acids, Enzymes and Coenzymes and Role of Metals in Biological systems

5. The Outcomes of B. Sc.III$_{rd}$ year (Chemistry Practical)

- After successful completion of course a Student should be able to:
- CO1:Estimate various metals (Ba, Zn, Fe, Ni, Cr, Pb) gravimetrically
- CO2:Study kinetics of reaction between acetone and iodine and the hydrolysis acetates
- CO3:Determine the solubility and solubility products of sparingly soluble compounds
- CO4:Separate binary organic mixture and identification of its components
- CO5:Prepare compounds such as soap, aspirin, benzoic acid, oxalic acid etc
- CO6:Qualitative analysis of food and vegetables