

B.Sc Chemistry

Programme Outcomes

After successful completion of “Three Year Degree Program” in Chemistry, a student will be able to:

- Understand basic concepts of Chemistry.
- Demonstrate, solve and develop an understanding of major concepts in all disciplines of chemistry.
- Will gain theoretical as well as practical knowledge of handling chemicals.
- Solve the problem and also think methodically, independently and draw a logical conclusion.
- Develop a broad foundation in chemistry that stresses scientific reasoning and analytical problem solving with a molecular perspective.
- Get exposure of theoretical knowledge about working of variety of experimental techniques.
- Understand the importance of the elements in the periodic table including their physical and chemical nature and role in the daily life.
- Learn the laboratory skills and safely to transfer and interpret knowledge entirely in the working environment.
- Understand the concept of chemistry to inter relate and interact to the other subject like mathematics, physics, biological science etc.
- Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.
- Acquainted with various opportunities related to chemistry available in the government services through public service commission particularly in the field of food safety, health inspector, pharmacist etc.

Programme Specific Outcomes

B.Sc.-I: After completion of one year syllabus students will have:

- i. Enhancement in their basic knowledge of chemistry
- ii. They will get to know the basics of three different branches of chemistry, viz. organic, inorganic and physical chemistry.
- iii. Understanding of various topics which deal with physical, inorganic and organic chemistry.
- iv. Develop the theoretical and practical knowledge through the experiments.

Course Outcomes

Paper 1A: After successful completion of course Paper 1A (Physical chemistry), the students will be able to:

- i. Get more clear ideas about the sub-topics of physical chemistry.
- ii. Understand major concepts and different aspects of physical chemistry.
- iii. Understand and define various topics of physical chemistry in broader sense like: Gaseous state, solid state, liquid state, Chemical and ionic equilibrium, Chemical kinetics.
- iv. Understand an overview of application of physical chemistry.

Paper 1B: After successful completion of course Paper 1B (Inorganic chemistry), the students will be able to:

- i. Understand clearly about the sub topics of inorganic chemistry.
- ii. Understand major concepts and different aspects of inorganic chemistry.

- iii. Understand and define various topics of inorganic chemistry in broader sense like: structure of atom, periodic table, chemical bonding, Metallurgy principles, molecular symmetry.
- iv. Understand an overview of application of inorganic chemistry.

Paper 1C: After successful completion of course Paper 1C (Organic chemistry), the students will be able to:

- i. Understand clearly about the sub topics of organic chemistry.
- ii. Understand major concepts and different aspects of organic chemistry.
- iii. Understand and define various topics of organic chemistry in broader sense like: basic principles, reaction mechanism, stereochemistry, nomenclature, estimation and purification of organic compounds.
- iv. Understand an overview of application of organic chemistry.

Paper 2: After successful completion of course Paper 2 (Practical paper), the students will be able to:

- i. Understand the principals involved in quantitative and qualitative estimation of elements with interfering radical in inorganic compounds.
- ii. Understand the procedure and mechanism of detection of elements and functional groups in organic compounds.

Programme Specific Outcomes

B.Sc.-II: After completion of two-year syllabus students will have:

- i. Further advancement in their knowledge of chemistry of each branch.
- ii. They will get to know and understand the topics of three different branches of chemistry, viz. organic, inorganic and physical chemistry in a more detailed and broader way.
- iii. Deeper understanding of various topics which deal with physical, inorganic and organic chemistry.
- iv. Develop novel theoretical and practical knowledge of the subject through the experiments.

Course Outcomes

Paper 3A: After successful completion of course Paper 3A (Physical chemistry), the students will be able to:

- i. Get deeper understanding about the sub-topics of physical chemistry.
- ii. Understand major concepts and different topics of physical chemistry as they are discussed here in detailed and descriptive manner.
- iii. Understand and define various topics of physical chemistry in broader sense like: solid state, equilibrium, chemical kinetics with the introduction of new topics like catalysis, colloids, distribution law etc.
- iv. Have a broader understanding of overview of application of physical chemistry.

Paper 3B: After successful completion of course Paper 3B (Inorganic chemistry), the students will be able to:

- i. Understand clearly about the sub topics of inorganic chemistry.
- ii. Understand major concepts and different aspects of inorganic chemistry.
- iii. Understand and define various topics of inorganic chemistry in broader sense like: structure of atom, periodic table, chemical bonding, with new topics like coordination chemistry, transition elements and spectroscopy and analytical chemistry.
- iv. Understand an overview of application of inorganic chemistry.
- v. Spectroscopy will provide a new tool to students to identify and detect elements and compounds.
- vi. Analytical chemistry topics will develop a more analytical approach and enhance the knowledge of students to work with chemicals on larger industrial scale.

Paper 3C: After successful completion of course Paper 3C (Organic chemistry), the students will be able to:

- i. Understand clearly about the sub topics of organic chemistry.
- ii. Understand major concepts and different aspects of organic chemistry in a deeper and broader way.
- iii. Understand and define various topics of organic chemistry in broader sense like: isomerism and its different types, detailed aspect of reaction mechanism, named reaction, aromatic compounds, carbohydrates.
- iv. The various reagents employed in organic chemistry and introduction with polymers will develop a synthetic industrial approach amongst students.
- v. Study of chromatographic techniques will develop more sharp knowledge of separation techniques.
- vi. Understand an overview of application of organic chemistry in every day-to-day life.

Paper 4: After successful completion of course Paper 4 (Practical paper), the students will be able to:

- i. Understand the principals involved in volumetric estimation related to acid base and redox based titrations.
- ii. Understand the procedure and mechanism of synthesis of certain specific organic reactions.

Programme Specific Outcomes

B.Sc.-III: After completion of three-year syllabus students will be able to:

- i. Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry.
- ii. Solve the problem and also think methodically, independently and draw a logical conclusion.
- iii. Get to know and understand the topics of three different branches of chemistry, viz. organic, inorganic and physical chemistry in a more detailed and broader way.
- iv. Deeper understanding of various topics which deal with physical, inorganic and organic chemistry.
- v. Employ critical thinking and the scientific knowledge to design, carry out, record and analyse the results of chemical reactions.
- vi. Develop novel theoretical and practical knowledge of the subject through the experiments.

Course Outcomes

Paper 5: After successful completion of course Paper 5 (Physical chemistry), the students will be able to:

- i. Develop much better understanding about the sub-topics of physical chemistry.
- ii. Understand major concepts and different topics of physical chemistry as they are discussed here in detailed and descriptive manner.
- iii. Understand and define various topics of physical chemistry in broader sense like: gaseous state, phase equilibrium, thermodynamics.

- iv. Introduction of new topics like wave mechanics, electrochemistry and surface chemistry advances the knowledge of students.
- v. Have a broader understanding and overview of various application of physical chemistry at industrial and commercial level.

Paper 6: After successful completion of course Paper 6 (Inorganic chemistry), the students will be able to:

- i. Develop much better understanding about the sub-topics of inorganic chemistry.
- ii. Understand major concepts and different aspects, principle involved in inorganic chemistry.
- iii. Understand and define various topics of inorganic chemistry in broader sense like: structure of atom, periodic table, chemical bonding, with new topics like organometallic chemistry, nuclear chemistry.
- iv. Introduction of inorganic chemistry in biological systems and the inorganic chains, rings and cages provide detailed involvement of inorganic chemistry in biological systems, their synthetic applications at industrial level.
- v. Understand an overview of application of inorganic chemistry.

Paper 7: After successful completion of course Paper 7 (Organic chemistry), the students will be able to:

- i. Understand clearly about the sub topics of organic chemistry.
- ii. Understand major concepts and different aspects of organic chemistry in a deeper and broader way.
- iii. Understand and define various topics of organic chemistry in broader sense like: general principles, detailed aspect of different types of reaction mechanism, named reaction.

- iv. The study of polynuclear aromatic hydrocarbons, heterocyclic compounds, dyes, alkaloids and drugs will develop knowledge of students regarding synthetic industrial application of organic chemistry.
- v. Study of reagents and their uses will develop knowledge of industrial and commercial application.
- vi. Understand an overview of application of organic chemistry in every day-to-day life.

Paper 8: After successful completion of course Paper 8 (Practical paper), the students will be able to:

- i. Understand the principals involved in determination of various physical properties like viscosity, surface tension, partition coefficient, refractive index, rate constant.
- ii. Understand the principals involved, procedure and mechanism of gravimetric estimations of different cations and anions.