

**Sher Shah College, Sasaram**  
**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:

- Enhancement in their basic knowledge of chemistry
- They will get to know the basics of three different branches of chemistry, viz. organic, inorganic and physical chemistry.
- Understanding of various topics which deal with physical, inorganic and organic chemistry.
- 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:

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

- Understand clearly about the sub topics of inorganic chemistry.
- Understand major concepts and different aspects of inorganic chemistry.
- Understand and define various topics of inorganic chemistry in broader sense like: structure of atom, periodic table, chemical bonding, Metallurgy principles, molecular symmetry.
- 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:

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

- Understand the principals involved in quantitative and qualitative estimation of elements with interfering radical in inorganic compounds.
- 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:

- Further advancement in their knowledge of chemistry of each branch.
- 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.
- Deeper understanding of various topics which deal with physical, inorganic and organic chemistry.
- 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:

- Get deeper understanding about the sub-topics of physical chemistry.
- Understand major concepts and different topics of physical chemistry as they are discussed here in detailed and descriptive manner.
- 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.
- 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:

- Understand clearly about the sub topics of inorganic chemistry.
- Understand major concepts and different aspects of inorganic chemistry.
- 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.
- Understand an overview of application of inorganic chemistry.
- Spectroscopy will provide a new tool to students to identify and detect elements and compounds.
- 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:

- Understand clearly about the sub topics of organic chemistry. Understand major concepts and different aspects of organic chemistry in a deeper and broader way.
- 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, and carbohydrates.
- The various reagents employed in organic chemistry and introduction with polymers will develop a synthetic industrial approach amongst students.
- Study of chromatographic techniques will develop more sharp knowledge of separation techniques.
- 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:

- Understand the principals involved in volumetric estimation related to acid base and redox based titrations.
- 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:

- Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry.
- Solve the problem and also think methodically, independently and draw a logical conclusion.
- 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.
- Deeper understanding of various topics which deal with physical, inorganic and organic chemistry.
- Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.
- 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:

- Develop much better understanding about the sub-topics of physical chemistry.
- Understand major concepts and different topics of physical chemistry as they are discussed here in detailed and descriptive manner.
- Understand and define various topics of physical chemistry in broader sense like: gaseous state, phase equilibrium, thermodynamics.
- Introduction of new topics like wave mechanics, electrochemistry and surface chemistry advances the knowledge of students.
- 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:

- Develop much better understanding about the sub-topics of inorganic chemistry.
- Understand major concepts and different aspects, principle involved in inorganic chemistry.
- Understand and define various topics of inorganic chemistry in broader sense like: structure of atom, periodic table, chemical bonding, with new topics like organ metallic chemistry, nuclear chemistry.
- 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.
- 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:

- Understand clearly about the sub topics of organic chemistry.
- Understand major concepts and different aspects of organic chemistry in a deeper and broader way.
- Understand and define various topics of organic chemistry in broader sense like: general principles, detailed aspect of different types of reaction mechanism, named reaction.
- The study of polynuclear aromatic hydrocarbons, heterocyclic compounds, dyes, alkaloids and drugs will develop knowledge of students regarding synthetic industrial application of organic chemistry.
- Study of reagents and their uses will develop knowledge of industrial and commercial application.
- 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:

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