



DEPARTMENT OF CHEMISTRY

PROGRAMME OUTCOMES

1. Students will have a firm foundation in the fundamentals and applications of chemical and scientific theories including those in analytical, inorganic, organic and physical chemistry.
2. Students will be able to design and carry out scientific experiments as well as accurately record and analyse the data of such experiments.
3. Students will develop skill in problem solving, critical thinking and analytical reasoning as applied to scientific problems.
4. Students will be able to explore new areas of research in both chemistry and allied fields of science and technology.
5. Students will appreciate the central role of chemistry in our society and use this as a basis for ethical behaviour in issues facing chemists including an understanding of safe handling of chemicals, environmental issues and key issues facing our society in energy, health and medicine.
6. Students will be able to explain why chemistry is an integral activity for addressing social.
7. Students will be able to function as a member of an interdisciplinary problem-solving team.

COURSE OUTCOMES

B. Sc. First Semester

There is nothing more fundamental to chemistry than the chemical bond. Chemical bonding is the language of logic for chemists. Chemical bonding enables scientists to take the 100-plus elements of the periodic table and combine them in myriad ways to form chemical compounds and materials. Periodic trends, arising from the arrangement of the periodic table, provide chemists with an invaluable tool to quickly predict an element's properties. These trends exist because of the similar atomic structure of the elements within their respective group families or periods, and because of the periodic nature of the elements. Reaction mechanism gives the fundamental knowledge of carrying out an organic reaction in a step-by-step manner. This course will provide a broad foundation in chemistry that stresses scientific reasoning and analytical problem solving with a molecular perspective. Students will gain an understanding of

- Molecular geometries, physical and chemical properties of the molecules.
- Current bonding models for simple inorganic and organic molecules in order to predict structures and important bonding parameters.
- This course gives a broader theoretical picture in multiple stages in an overall chemical reaction.
- It describes reactive intermediates, transition states and states of all the bonds broken and formed.
- It enables to understand the reactants, catalyst, stereochemistry and major and minor products of any organic reaction. It describes the types of reactions and the kinetic and thermodynamic aspects one should know for carrying out any reaction and the ways how the reaction mechanism can be determined.
- The chapter stereochemistry gives the clear picture of two-dimensional and three-dimensional structure of the molecules, and their role in reaction mechanism. The course will also strengthen the knowledge of students regarding complete picture of states of matter that includes gaseous, liquid, solid and colloidal states.

B. Sc. Second Semester

Upon successful completion of this course, the students will be able to describe the reactions shown by aliphatic and aromatic compounds. They will also be able to understand the bonding in inorganic molecules, salient features of s- and p- block elements, different aspects of chemical kinetics, catalysis and first law of thermodynamics.

B. Sc. Second Year

This paper also provides a detailed knowledge on the elements present in our surroundings, their occurrence in nature. Their position in periodic table, their physical and chemical properties. This paper also gives detailed understanding of the d-block elements and their characteristics.

This paper provides detailed knowledge of synthesis of various classes of organic compounds and functional groups inter conversion. Organic synthesis is the most important branch of organic chemistry which provides jobs in production & Quality Control departments related to chemicals, drugs, medicines, etc industries.

After successful completion of this course, the students will be able to gather the information regarding Werner's theory and VBT of transition metal complexes. Students will be able to learn the basic concepts of spontaneity, chemical and phase equilibrium and able to apply these concepts in predicting the spontaneous reactions and will be able to solve the numerical problems based on these concepts.

The students will be able to describe the concepts of electrochemistry in detail and its applications. Also, they will be able to solve the numerical problems based on these concepts. Students will be able to define the acids and bases on the basis of various concepts / theories and will be able to identify the position of various elements in the periodic table and able to explain their properties on the basis of their position.

B. Sc. Final Year

Upon successful completion of this course,

- The students will be able to describe the stability, crystal field theory, electronic spectra and magnetic properties of coordination compounds. They will also learn about organometallic compounds, some industrially important inorganic materials and their applications in various industries. It will assist them to get a suitable job in the relevant industrial and scientific field.
- The students will be able to describe the chemistry of nitrogen containing compounds, the basic understanding of the chemistry of industrially important materials such as lipids, fats, soaps, detergents, dyes, paints and reagents in organic synthesis. Upon completion of this course students may get job opportunities in food, soap, detergent, paint and other organic material based synthetic labs and industries. Biomolecules are important for the functioning of living organisms. These molecules perform or trigger important biochemical reactions in living organisms. When studying biomolecules, one can understand the physiological function that regulates the proper growth and development of a human body. This course aims to introduce the students with basic experimental understanding of carbohydrates and proteins.
- Thermodynamics will help them to understand the natural flow of energy. Learning the Quantum Mechanics will help them to praise the beauty of behaviour of fundamental particles. It will assist them to get a suitable job in the relevant industrial and scientific field.
- The students will be able to understand the chemistry of biomolecules. They will become acquainted in the field of data analysis. The chemistry of industrially important inorganic materials such as cement, ceramics, glass and inorganic fertilizers has been incorporated in the course to enhance the skills and capability of the students pursuing this course.
- Students will gain an understanding of how to determine the structure of organic molecules using UV, IR and NMR spectroscopic techniques.