Course Outcome of Chemistry as per NEP 2020

DEPARTMENT OF CHEMISTRY

Government P.G.College, New Tehri

Affiliated to SRI DEV SUMAN UTTARAKHAND UNIVERSITY

B.Sc. Sem I

Paper – I (Theory)

Course Title: Fundamentals of Chemistry-I

Course Outcomes: Chemistry is based on the chemical bond and chemical activities of 100 plus elements. Periodic properties of the elements in the periodic table provide information of the chemical compounds. 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 modified course will lay the foundation for the fundamental understanding of chemistry with scientific reasoning.Students will gain an understanding of;

1.Chemical and physical behavior of organic compound based on its functional group(s) and geometry.

2.The basic physical, chemical and stereochemical properties of chemical compounds.

3.Current bonding models for simple inorganic and organic molecules in order to predict structures and important bonding parameters.

4.A broader theoretical picture in multiple stages in an overall chemical reaction.

5.The chapter stereochemistry gives the clear picture of two-dimensional and threedimensional 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 state.

B.Sc. Sem I

Paper – II (Practical)

Course Title: Chemical Analysis-I

Course outcomes: After completing this course, students will have the basic understanding of laboratory methods. They will have the skill to perform the inorganic mixture analysis and estimation of surface tension. The students will be able to

1.Determine the surface tension of given unknown liquid.

2.Qualitative estimation of acid and basic radicals.

3.Measurement of absolute configuration of organic compounds.

B.Sc. Sem-II

Paper – I (Theory)

Course Title: Fundamentals of Chemistry-II

Course outcomes: After studying this course the student will be able to

1. Describe the salient features of s- and p- block elements.
2. Write the chemical reactions of aliphatic compounds such as alkenes and cyclic compounds.
3. Properties of aromatic compounds and their chemical reactions.
4. Different aspects of chemical kinetics, catalysis and first law of thermodynamics.
5. Understand the formation of molecules.

B.Sc. Sem-II

Paper – II (Practical)

Course Title: Chemical Analysis-II

Course outcomes: Upon successful completion of this course, the students will be able to quantitatively find out the amount of acid or base in the samples, to qualitatively differentiate among different classes of organic compounds and to measure the relative viscosity of a given liquid.

B.Sc.Sem-III

Paper – I(Theory)

Course Title: General Chemistry-I

Course outcomes: upon successful completion of this course, students will gain detailed knowledge of various organic compounds and functional groups inter conversion. Organic synthesis is the most important branch of organic chemistry which provides jobs in production & QC departments related to chemicals, drugs, medicines, FMCG etc. industries.

1. Understand the concepts of organic reactions and techniques of writing the movement of electrons in nucleophilic reactions.
2. Students will be able to gather the information regarding Werner's theory and VBT of transition metal complexes.
3. 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.
4. Understand the concept of second law of thermodynamics.

B.Sc. Sem-III

Paper – II (Practical)

Course Title: Analytical Procedures-I

Course outcomes: After completing this course, the students will be able to test the inorganic mixtures of acidic and basic radicals in given samples, to qualitatively differentiate between alcohols and phenols and determine the critical solution temperature of partially miscible liquids. They will also understand the safety practices in Chemical Laboratory. Determination of alkali content in acids.

B.Sc. Sem-IV

Paper – I(Theory)

Course Title: General Chemistry-II

Course outcomes: This paper provides detailed knowledge of

1. Chemical properties and synthesis of aldehydes and ketones, carboxylic acids and their functional group interconversion.
2. Students will be able to define the various concepts of acids and bases.
3. Chemistry of lanthanides and actinides; methods of preparation and complex formation.
4. Students will the understand the fundamentals of Chemistry and the solve the numerical problems related to Electrochemistry-I and Electrochemistry-II.

B.Sc. Sem- IV

Paper – I (Practical)

Course Title: Analytical Procedures-II

Course outcomes: After completing this course, students will be able to

1. Laboratory hazards and safety precautions.
2. Determine solubility of salts
3. Perform volumetric titration based on redox titrations.
4. Preliminary test for functional groups like aldehyde and ketones.

B.Sc. Sem- V

Paper – I(Theory)

Course Title: Inorganic Chemistry

Course Outcomes: Upon successful completion of this course, the students will be able to

1. Understand an elementary idea about crystal field theory (CFT), stability of metal complexes.
2. Explain the origin of magnetic behavior, concept of magnetic susceptibility and magnetic properties of various elements.
3. 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.
4. Learn about various electronic transitions.

B.Sc. Sem-V

Paper – II (Theory)

Course Title: Organic Chemistry

Course Outcomes: Upon successful completion of this course, the students should 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.

B.Sc. Sem-V

Paper – III (Practical)

Course Title: Analytical Procedures-III

Course outcomes: Upon completion of this course, the students will have the knowledge and skills to understand the synthetic methods related to inorganic and organic fields.Inorganic synthesis of tetraamminecopper(II) sulphate and hexaamminenickel(II) chloride. Crystallization of compounds. Also, they can easily analyze the nitrogen containing compounds and separate the binary organic mixture. This will be be helpful in various Industries.

B.Sc. Sem-VI

Paper-I (Theory)

Course Title: Physical Chemistry

Course outcomes: The core concepts of Physical Chemistry have been included in this semester with a view that students' command over these topics will help them to understand the higher chemistry in PG classes. Their understanding of surface tension and radioactivity will help them to understand the day to day related activities. Quantum mechanics will help to understand the fundamentals of particles and their physical significance. The third law of thermodynamics will make sure to understand the properties of crystalline solids and their entropy. Understanding of surface chemistry will be helpful to explain catalysis.

B.Sc. Sem-VI

Paper-II (Theory)

Course Title: Analytical Chemistry

Course outcomes: After completion of this course, the students will be able to understand the chemistry of biomolecules. They will become acquainted in the field of data analysis. The new frontiers of chemistry such as nano-chemistry and green chemistry are the part of syllabi of this course which boost the knowledge of the students in these fields. 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 thestudents pursuing this course.

1. Students will be able to explore new areas of research in both chemistry and allied fields of science and technology.
2. Students will be able to function as a member of an interdisciplinary problem solving team
3. Students will be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.

B.Sc. Sem-VI

Paper-III (Practical)

Course Title: Analytical Procedures-IV

Course outcomes: After successful completion of this course, students will be able to determine the functional group by various spectroscopic methods like UV, IR. They can also determine the solubility of organic compounds which will make them ready for industrial jobs