

LEARNING OUTCOMES / COURSE OUTCOMES

Chemistry as Discipline Specific Course (DSC)

First B.Sc., Semester – I, (Revised NEP)

CHEMISTRY – I : HNA 260

1. The concepts of chemical analysis, accuracy, precision and statistical data treatment .
2. Prepare the solutions after calculating the required quantity of salts in preparing the reagents/solutions and dilution of stock solution.
3. Describe the dual nature of radiation and matter; dual behavior of matter and radiation, de Broglie's equations, Heisenberg uncertainty principle and their related problems.
4. Quantum mechanics. Derivation of Schrodinger's wave equation. Radial and angular Orbital shapes of s, p, d and f atomic orbitals, nodal planes. Electronic configurations of the atoms.
5. Pauli's exclusion principle, Hund's rule , Aufbau's principle and its limitation.
6. The concepts of Organic reactions and techniques of writing the movement of electrons, bond breaking, bond forming.
7. The Concept of aromaticity, resonance, hyper conjugation, etc.
8. Explain bond properties, electron displacement effects (inductive effect, electrometric effect, resonance effect and Hyperconjugation effect). steric effect and their applications in explaining acidic strength of carboxylic acids, basicity of amines.
9. Understand basic concept of organic reaction mechanism, types of organic reactions.
10. Understand the preparation and reactions of alkanes.
11. Understand the stability and conformational analysis of cycloalkanes.
12. Understand the concept of resonance , aromaticity and antiaromaticity.
13. Describe relative strength of aliphatic and aromatic carboxylic acids.
14. Explain the existence of different states of matter in terms of balance between intermolecular forces and thermal energy of the particles. Explain the laws governing behavior of ideal gases and real gases. Understand cooling effect of gas on adiabatic expansion.
15. Understand the conditions required for liquefaction of gases. Realize that there is continuity in gaseous and liquid state.

16. Understand the properties of liquids in terms of intermolecular attractions.
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18. Understand the conditions required for liquefaction of gases. Realize that there is continuity in gaseous and liquid state.
19. Understand the properties of liquids in terms of intermolecular attractions.

CHEMISTRY LAB

B.Sc. Semester –I (Revised NEP)

Practical Chemistry - Paper-I: HNAP 260

After studying this course and performing the experiments set in it student will be able to:

1. Basic concepts involved in titrimetric analysis, primary standard substances, preparation of standard solutions.
2. Explain the principles of acid-base, redox and iodometric titrations.
3. Work out the stoichiometric relations based on the reactions involved in the titrimetric analysis.
4. Understand the preparation of organic compounds involving addition, substitution, hydrolysis, diazotization and condensation reactions.
5. Understand the method of analysis of organic compounds.

LEARNING OUTCOMES / COURSE OUTCOMES

Chemistry as Discipline Specific Course (DSC)

B.Sc. Semester –II (Revised NEP)

CHEMISTRY- II : HNB 260

1. Understand principles of titrimetric analysis.
2. Understand principles of different type's titrations. Titration curves for all types of acids – base titrations.
3. Gain knowledge about balancing redox equations, titration curves, theory of redox indicators and applications.
4. Understand titration curves, indicators for precipitation titrations involving silver nitrate- Volhard's and Mohr's methods and their differences.
5. Indicators for EDTA titrations - theory of metal ion indicators. Determination of hardness of water.
6. Understand periodic table, classification and properties of s, p, d and f block elements
7. Understand different scales for the measurement of electro-negativity and factors affecting it.
8. Understand the chemistry of the hydrides, carbides, oxides and halides of group 13 to 17 elements.
9. Understand nucleophilic substitution at saturated carbon, energy profile diagram stereochemistry and factors affecting S_N^1 and S_N^2 reactions.
10. Aromatic electrophilic substitution reactions like nitration sulphonation, Friedel-Crafts reactions.
11. Understand liquid crystals, classification with examples.
12. Understand the different forms of solids, laws of crystallography , miller indices and its calculation, X-ray diffraction studies. Brags law and its equation .
13. Defects in solids , properties of glasses and concept of liquid crystals.

CHEMISTRY LAB

B.Sc. Semester –II (Revised NEP)

Practical Chemistry - Paper-II : HNBP 260

After studying this course and performing the experiments set in it student will be able to:

1. Basic concepts involved in titrimetric analysis, primary standard substances, preparation of standard solutions.
2. Explain the principles of acid-base, redox and iodometric titrations.
3. Describe the significance of inorganic quantitative analysis.
4. Determine of density followed by the determination of viscosity and surface tension of different liquid samples.
5. Determination of partition coefficient of different liquid mixtures.
6. Determination of rate constant in the decomposition reaction of hydrogen peroxide.