Lesson Plan

BSc Physical Sciences (Chemistry)

Mixed Scheme: NEP 2020 (Semester I & III) and Old Scheme (Semester V)

Session: 2025–26

Affiliation: Indira Gandhi University, Meerpur (Haryana)

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1. General Information

- Programme: BSc Physical Sciences
- Subject: Chemistry
- Semester Covered: I, III (NEP 2020) and V (Old / Pre-NEP)
- Medium of Instruction: English (Hindi support where required)
- Teaching Methods: Lecture, Interactive Discussion, Chalk & Talk, PPT, Tutorials, Problem Solving, Assignments, Seminars, E-content
- Assessment Pattern:
- NEP Semesters: Continuous Internal Assessment + End-Semester Examination
- Old Scheme: Internal Assessment + University Examination

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2. Semester-wise Lesson Plan

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Semester I – NEP 2020

Course: Chemistry – Fundamentals (Physical & General Chemistry)

Credits: As per IGU NEP Scheme

Unit I: Atomic Structure and Quantum Chemistry

- Dual nature of matter and radiation
- de Broglie hypothesis
- Heisenberg uncertainty principle

- Schrödinger wave equation (conceptual)
- Quantum numbers and their significance

Unit II: Chemical Bonding
- Ionic, covalent and coordinate bonding
- Valence bond theory
- Hybridization and molecular shapes
- Introduction to molecular orbital theory

Unit III: States of Matter
- Gaseous state and gas laws
- Ideal and real gases
- Liquefaction of gases

Teaching Hours: 45

Learning Outcomes:
- Understand quantum mechanical basis of atomic structure
- Explain chemical bonding and molecular geometry
- Apply gas laws to real-life problems

NEP Focus: Conceptual understanding, problem-solving, multidisciplinary relevance

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Semester III – NEP 2020

Course: Chemistry – Inorganic & Organic Foundations

Credits: As per IGU NEP Scheme

Unit I: Periodic Properties and s-Block Elements
- Modern periodic table and periodic trends
- Atomic and ionic radii, ionization energy, electron affinity
- General characteristics of s-block elements
- Anomalous behavior of lithium and beryllium

Unit II: Basic Organic Chemistry
- Hybridization of carbon

- Inductive, mesomeric and hyperconjugation effects
- Homolytic and heterolytic fission
- Types of reagents and reaction intermediates

Unit III: Alkanes and Alkenes
- Preparation and properties
- Reaction mechanisms
- Environmental and industrial relevance

Teaching Hours: 45

Learning Outcomes:
- Correlate periodic trends with chemical behavior
- Understand fundamental organic chemistry concepts
- Explain mechanisms of basic organic reactions

NEP Focus: Analytical thinking, environmental awareness, skill-based learning

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Semester V – Old Scheme (Pre-NEP)

Paper: Physical Chemistry III

Title: Chemical Kinetics and Electrochemistry

Unit I: Chemical Kinetics
- Rate of reaction and rate laws
- Order and molecularity of reactions
- Integrated rate equations
- Arrhenius equation and energy of activation

Unit II: Electrochemistry
- Conductance and specific conductance
- Kohlrausch’s law
- Electrochemical cells
- Nernst equation and its applications

Teaching Hours: 45

Learning Outcomes:

- Solve numerical problems related to kinetics
- Understand electrochemical principles and applications

Assessment (Old Scheme):

- Internal Assessment: 30%
- University Examination: 70%

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3. Teaching–Learning Resources

- Standard Chemistry textbooks (Physical, Organic, Inorganic)
- PPTs and e-resources
- University question papers
- Virtual labs and simulations

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4. Expected Programme Outcomes

- Strong conceptual foundation in chemistry
- Development of analytical and problem-solving skills
- Preparation for higher studies and competitive examinations

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Prepared for Academic Session 2025–26 as per IGU Meerpur guidelines