Lesson Plan (2024-25)

Assistant Professor :-Sh. Ashok Kumar **Subject:- Chemistry**

Class and Semester:- B.Sc III (VI sem) **w.e.f. : 01/01/2025**

Week	Topic
Ist week	Application of IR in structure elucidation of organic compounds carbonyl and effect of substituents on it C-H N-H O-H vibration and H- bonding unsaturated mono and di substituted aromatic compounds metal ligand vibrations
2nd week	Group frequencies of metal complex ligands and effect of coordination Applications of Far and Near IR.
3nd week	Basic principle of NMR , chemical shift, measurement and factors affecting it spin spin coupling mechanism of nuclear spin coupling constant and factors affecting
4th week	anisotropic effect in alkenes alkynes aldehyde and aromatics simplification of complex spectra Interpretation of spectra of some simple organic compounds distinction between geometrical isomers
5th week	C-NMR basic principle chemical shift and its calculation Application of IR UV and NMR for identification of organic compounds
6th week	Introduction Ion production -EI , CI, FD, FAB factors affecting fragmentation Mclafferty rearrangement Nitrogen Rule Mass spectral fragmentatioin of organic compounds
7th week	Black body radiation Plancks Radiation law Photo electron effect Compton effect wave function and significance of postulates of quantum mechanics quantum mechanical operators
8th week	commutation relations hemiltonian operator hermition operator schrodinger equations and its appliactions to free particle and one dimensional box quantization of energy and
9th week	zero point energy degeneracy Extension to three dimensional box Heisenberg principle
10th week	**Rigid rotator model** of rotation of diatomic molecule schrodinger equations transformation to spherical coordinates and separation of variables Sphere cal harmonics and qualitative discussion of solution
11th Week	Interaction of EM radiation with molecules and types of spectra B.O approximation
12th week	Rotational Spectroscopy Vibrational Spectrascopy
13th week	Raman Spectroscopy Electronic Spectroscopy
14th week	Revision and Assignments

Govt. College For Women, Tosham (Bhiwani)

Lesson Plan (2025-26)

Name of Asst. Prof.: Dr. Pardeep

Subject: Chemistry

Class: B.Sc. III Sem. (w.e.f.- 01.08.2025)

Week	Unit Covered
1st	Alkynes
2nd	Benzene and its Derivatives
3rd	Benzene and its Derivatives
4th	Alkyl Halides
5th	Aryl Halides
6th	Stereochemistry of Organic Compounds
7th	Stereochemistry of Organic Compounds
8th	Electrochemistry-I
9th	Electrochemistry-I
10th	Electrochemistry-II
11th	Electrochemistry-II
12th	s- and p- block Elements
13th	s- and p- block Elements
14th	s- and p- block Elements
15th	s- and p- block Elements

Pardeep
Signature

Choudhury Bansilal Government College for Women, Tosham
Lesson Plan (2025-26)

Name of Assistant Professor :- Dr. Monika Sheoran Subject:- Chemistry

Class :- B.Sc. I Year I Semester (w.e.f. 01-08-2025)

Unit I – Atomic Structure & Periodic Properties (12 Hours)

Weeks 1–3 (1st Aug – 20th Aug)

- **Week 1 (1–7 Aug):** Dual nature of matter & radiation, de Broglie's hypothesis, Heisenberg's uncertainty principle.
- **Week 2 (8–14 Aug):** Quantum numbers, atomic orbitals, shapes of s, p, d orbitals.
- **Week 3 (15–20 Aug):** Aufbau principle, Hund's rule, Pauli's exclusion principle, Slater's rules, periodic properties (ionization energy, atomic & ionic radii, electronegativity trends).

Unit II – Gaseous State (11 Hours)

Weeks 4–5 (21st Aug – 10th Sept)

- **Week 4 (21–27 Aug):** Kinetic theory of gases, Maxwell's distribution of velocities (qualitative), mean velocity, most probable velocity.
- **Week 5 (28 Aug – 3 Sept):** Mean free path, collision frequency, deviation of real gases from ideal behavior, Van der Waals equation.
- **Week 6 (4–10 Sept):** Boyle's temperature, critical constants (Tc, Pc, Vc), critical phenomenon, applications.

Unit III – Structure & Bonding / Organic Reaction Mechanism (11 Hours)

Weeks 7–9 (11th Sept – 30th Sept)

- **Week 7 (11–17 Sept):** Localized vs delocalized chemical bond, Van der Waals interactions, resonance & hyperconjugation.
- **Week 8 (18–24 Sept):** Inductive effect, electromeric effect, comparison of electronic effects. Curved arrow notation, bond fission (homolytic & heterolytic).
- **Week 9 (25–30 Sept):** Types of organic reactions (substitution, addition, elimination, condensation, rearrangement), reactive intermediates (carbocations, carbanions, free radicals).

Unit IV – Liquid State & Solid State (11 Hours)

Weeks 10–12 (1st Oct – 20th Oct)

- **Week 10 (1–7 Oct):** Liquid state – surface tension, viscosity, refractive index, optical activity.
- **Week 11 (8–14 Oct):** Solid state – crystal systems, symmetry elements, Bravais lattices.
- **Week 12 (15–20 Oct):** Miller indices, X-ray diffraction, Bragg's law, powder pattern method.

Revision & Tests

Weeks 13–15 (21st Oct – 10th Nov)

- **Week 13 (21–27 Oct):** Unit I & II revision, short problems, quiz/test.
- **Week 14 (28 Oct – 3 Nov):** Unit III & IV revision, assignments.
- **Week 15 (4–10 Nov):** Comprehensive revision, previous year questions discussion.

Final Exam Preparation

Weeks 16–17 (11th – 20th Nov)

- **Week 16 (11–17 Nov):** Problem-solving sessions, clarification of difficult concepts.
- **Week 17 (18–20 Nov):** Quick recap before final exams.

Signature

Lesson Plan (2025-26)

Assistant Professor :-Sh. Ashok Kumar **Subject:- Chemistry**

Class and Semester:- B.Sc III (V sem) **w.e.f. : 01/08/2025**

Week	Topic
Ist week	Organometallic compounds definition and classification of organometallics on the basis of bond type. concepts of hapticity of ligands. metal carbonyals; 18 e rule , e count of mononuclear , polynuclear and substituted metal carbonyls of 3d series. Prepration (direct combination, reductive carbonylation, thermal and photo chemical decomposition) of mono and binuclear carbonyls of 3d series.
2nd week	Structure of mono and binuclear carbonyls of Cr, Mn, Fe, Co and Ni using VBT pi acceptor behaviour of Co(MO diagram of CO to be discussed), synergic effect and use of IR data to explain extent of backbonding . Class test
3nd week	Zeise salt ; prepration and structure, evidences of synergic effect and comparision of synergic effect with that in carbonyls metal alkyls. Important features of methyl Li (tetramer) and tryalkyls Al (dimer) , conepts of multicentre bonding.
4th week	ferrocene; prepration and prepration and reaction(acetylation ,alkylation, metallation, mannich condensation). structure of and aromaticity. comparision of reactivity with that of benzene
5th week	Study of the following industrial processes and there mechanism: Alkene hydrogenation (Wilkinsons catalyst) Synthetic gasoline Fischer Tropsch reaction polymerisation of ethane using zieglar-Natta catalyst.
6th week	Metal ions present in biological system classification of elements sodium-K pump carbonic anhydrase and carboxy peptidase excess and deficiency of trace elements toxicity of metal ions use of chelating agent in medicine cisplatin as anticancer drug
7th week	Iron and its application in biological system Haemoglobin and myoglobin storage and transfer of ions.
8th week	Classification of polymers molecular forces and chemical bonding texture functionality and its importance
9th week	classification of polymerization process relationship between functionality , extent of reaction and degree of polymerization CLASS TEST
10th week	Diwali Break
11th Week	Mechanism and kinetics of step growth, chain growth , coordination and co polymerization Polymerization techniques.
12th week	Conducting polymers: Polymer of Aniline , thiophene , acetylene, pyrolle.
13th week	Preperation structure properties and application of Polymer of olefins , styrene vinyl chloride , vinyl acetate , acrylic , fluoro , amides phenol formaldehyde eurethanes and silicones
14th week	Revision and Assignments