

GOVERNMENT COLLEGE BIROHAR (JHAJJAR)

Summary of Lesson Plans of College Faculty for Academic Session 2025-26

Name of Assistant Professor: RAJESH KUMAR

Class & Sem.: B.Sc. (L.S.T.P.S) 2nd Sem Subject: CHEMISTRY

| Months | Topics/Chapters to be covered |
|---------------|--|
| Jan 2026 | <u>Unit-1st</u> "Electronic Spectrum" Concept of Potential Energy curve for Bonding and Anti-Bonding molecular orbitals, qualitative description of selection rules and Franck-Condon Principle. Qualitative description of sigma and pi and n-molecular orbital, their energy level and respective transitions. Test of this unit. |
| Feb 2026 | <u>Unit-2nd</u> "Photochemistry". Interaction of radiation with matter, diff. b/w thermal and photochemical process. law of photochemistry, Grotthuss-Draper law, Stark-Einstein law. Jablonski Diagram depicting various processes occurring in excited state. qualitative description of fluorescence, phosphorescence non-radiative process, quantum yield, photosensitized RAS - energy transfer processes. Assignment-Preparation of unit |
| March 2026 | <u>Unit-3rd</u> "Solutions" Ideal, non-ideal sol ⁿ , methods of expressing concentrations of solutions, activity and activity coefficient, Dilute solution, Colligative Properties. Raoult's law, relative lowering in v.p., osmotic pressure and measurement determination of molecular wt. from D.R.L.V.P and O.T. Elevation of boiling pt and depression of f.pt. Thermodynamic derivation of relation b/w molecular wt. and elevation in B.pt. and depression in f.pt. Experimental methods for determining various colligative prop. Abnormal M.W. Unit test of "Solutions" unit. |
| April 2026 | <u>Unit-4th</u> "Phase Equilibrium" Statement and meaning of the terms - phase component and degree of freedom, thermodynamic derivation of Gibbs phase rule, phase equilibria of one component system - Example - Water and Sulphur systems. Phase equilibria of two comp systems solid-liq. equilibria, simple eutectic, eg. Pb-Ag system, desilverisation of lead. Revision of syllabus. |

Signature of Assistant Professor



GOVERNMENT COLLEGE BIROHAR (JHAJJAR)

Summary of Lesson Plans of College Faculty for Academic Session 2025-26


Name of Assistant Professor: RAJESH KUMAR

3rd yrs.

Class & Sem.: B.Sc. Bot (P.S.+L.S.) and Subject: CHEMISTRY

(6th Sem)

| Months | Topics/Chapters to be covered |
|-----------------------|---|
| Jan 2026 | <p>Unit 1st Lit "Non-Aqueous Solvents"</p> <p>Physical properties of a solvent, its type and their general characteristics, solvent system concept, K_{sp} in non-aqueous solvents with reference to $CaCO_3$ and $CaSO_4$. HSAB concept of Acid-Base, application of HSAB Principle.</p> <p>Noble Gases - Occurrence and uses, interconversion of noble gas, clathrates, preparation and properties, chemical Prop. of noble gases, chemistry of Xenon: - structure and bonding in xenon fluorides, oxides and oxyfluorides. shape of noble gas compounds, Bonding in Noble Gas compounds.</p> <p>Unit test of non-aq. solvents.</p> |
| Feb 2026 | <p>Unit 2nd "Thermodynamics"</p> <p>Brief discussion upto 1st law of thermodynamics, Heat capacity, C_p, C_v and their relationship, Joule's law, Joule-Thomson coefficient for ideal gases and real gases and inversion temp, calculation of work and heat, dU and dH for expansion of ideal gases and real gases under isothermal and adiabatic conditions. Kirchhoff's law. 2nd Law of thermodynamics and its limitation. Carnot cycle and its efficiency, Carnot's theorem thermodynamic scale of temp, concept of entropy. Entropy as a criterion of spontaneity and equilibrium. Prepara Assignment -</p> |
| March 2026 | <p>Unit 3rd Lit "Hydrocarbons": -</p> <p>Alkanes - Physical and chemical properties of alkanes, free radical substitutions, halogenation, concept of relative reactivity and selectivity. Alkenes - structure and isomerism, preparation, physical and chemical properties, mechanism of E_1, E_2, E_1cB R_x's. Saytzeff and Hoffmann elimination, Electrophilic addition. Markovnikov's rule, syn and anti addition, addⁿ of H_2, X_2, oxymercuration-demercuration, hydroboration-oxidation. Alkynes - General method of Prep. R_x's of Alkyne acidity, hydration, alkylation of terminal alkynes. Unit test of Hydrocarbons</p> |
| April 2026 | <p>Unit 4th "Aromatic Hydrocarbons and Dienes"</p> <p>Concept of aromaticity, Huckel's rule, aromatic character of arenes, cyclic carbocation and carbanions, heterocyclic comp. with suitable exmp. Electrophilic aromatic substitution, halogenation, nitration, sulphonation, Friedel Craft alkylation/acylation with their mech., directing effects of groups in electrophilic substitution. Nomenclature and classification of Dienes: - isolated, conjugated and cumulated dienes. Structure of butadiene, chemical R_x's - 1,2 and 1,4-addition reactions, Diels-Alder R_x. Revision of syllabus.</p> |


 Signature of Assistant Professor 06/02/26