LESSON PLAN
(January to April 2024)
(Even Semester)

Name: Dr. Urmila
Class: B.Sc. I (2 Sem)
Subject: Physical Chemistry

Sr. No.	Week	Content
	01/01/24 – 15/01/24	PRACTICAL EXAMINATION
UNIT-1	16/01/24-20/1/24	**Kinetics-I** Rate of reaction, rate equation, factors influencing the rate of a reaction – concentration, temperature, pressure, solvent, light, catalyst.
	22/1/24 - 27/1/24	Order of a reaction, integrated rate expression for zero order,
	29/1/24 - 03/2/24	first order, second and third order reaction.
	05/02/24 - 10/02/24	Half life period of a reaction. Methods of determination of order of reaction.
UNIT-2	12/02/24 - 17/02/24	**Kinetics-II** Effect of temperature on the rate of reaction – Arrhenius equation.
	19/02/24 - 24/02/24	Theories of reaction rate–Simple collision theory for unimolecular and bimolecular collision.
	26/02/24 - 02/03/24	Transition state theory of Bimolecular reactions.
	04/03/24 – 09/03/24	TEST OF UNIT 1 &2
UNIT-3	11/03/24 – 16/03/24	**Electrochemistry-I** Electrolytic conduction, factors affecting electrolytic conduction, specific, conductance, molar conductance, equivalent conductance and relation among them, their variation with concentration.
	18/ 03/24 – 22/03/24	Arrhenius theory of ionization, Ostwald's Dilution Law. Debye-Huckel–Onsager's equation for strong electrolytes (elementary treatment only)
	23/03/24 – 31/03/24	**HOLI BREAK**
	01/04/24 – 06/04/24	Transport number, definition and determination by Hittorfs methods, (numerical included)
UNIT-4	08/04/24 – 13/04/24	**Electrochemistry-II** Kohlarausch's Law, calculation of molar ionic conductance and effect of viscosity temperature & pressure on it. Application of Kohlarausch's Law

		in calculation of conductance of weak electrolytes at infinite diloution.
	15/04/24 – 20/04/24	Applications of conductivity measurements: determination of degree of dissociation, determination of Ka of acids determination of solubility product of spa ringly soluble salts, conductometric titrations.
	22/04/24 – 27/04/24	Definition of pH and pKa, Buffer solution, Buffer action, Henderson – Hazelequation, Buffer mechanism of buffer action.
	29/04/24 – 30/04/24	Test of unit 3 & 4
	01/05/24 - ONWARDS	EXAMINATIONS
	20/05/24 – 30/06/24	SUMMER BREAK

LESSON PLAN
(January to April 2024)
(Even Semester)

Name: Dr. Urmila,
Class: B.Sc. 2 (4 Sem)
Subject: Organic Chemistry

Sr. No.	Week	Content
	01/01/24 – 15/01/24	PRACTICAL EXAMINATION
UNIT-1	16/01/24-20/1/24	**Infrared (IR) absorption spectroscopy** Molecular vibrations, Hooke's law, selection rules, intensity and position of IR bands, measurement of IR spectrum
	22/1/24 - 27/1/24	Fingerprint region, characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds.
	29/1/24 - 03/2/24	Applications of IR spectroscopy in structure elucidation of simple organic compounds.
UNIT-2	05/02/24 - 10/02/24	**Amines** Structure and nomenclature of amines, physical properties. Separation of a mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines.
	12/02/24 - 17/02/24	Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles, reductive amination of aldehydic and ketonic compounds.
	19/02/24 - 24/02/24	Gabrielphthalimide reaction, Hofmann bromamide reaction. Electrophilic aromatic substitution in aryl amines, reactions of amines with nitrous acid.
	26/02/24 - 02/03/24	Test unit 1 & 2
UNIT-3	04/03/24 – 09/03/24	**Diazonium Salts** Mechanism of diazotisation, structure of benzene diazoniumchloride, Replacement of diazo group by H, OH, F, Cl, Br, I, $NO_2$and CN groups,
	11/03/24 – 16/03/24	reduction of diazonium salts to hyrazines, couplingreaction and its synthetic application.
	18/ 03/24 – 22/03/24	**Nitro Compounds** Preparation of nitro alkanes and nitro arenes and their chemical reactions. Mechanism of electrophilic substitution reactions in nitro arenes and their reductions in acidic, neutral and alkaline medium.
	23/03/24 – 31/03/24	**HOLI BREAK**
UNIT-4	01/04/24 – 06/04/24	**Aldehydes and Ketones** Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, advantage of oxidation of alcohols with chromium trioxide (Sarett reagent) pyridinium chlorochromate (PCC) and pyridinium dichromate.,
	08/04/24 – 13/04/24	Physical properties. Comparison of reactivities of aldehydes and ketones. Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin, aldol,

		Perkin and Knoevenagel condensations.
	15/04/24 – 20/04/24	Condensation with ammonia and its derivatives. Wittig reaction. Mannich reaction. Oxidation of aldehydes, Baeyer–Villiger oxidation of ketones, Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner, LiAlH4and NaBH4reductions.
	22/04/24 – 27/04/24	PRACTICE AND ASSIGNMENT
	29/04/24 – 30/04/24	Test of unit 3 & 4
	01/05/24 - ONWARDS	EXAMINATIONS
	20/05/24 – 30/06/24	SUMMER BREAK

LESSON PLAN
(January to April 2024)

(Even Semester)

Name: Dr. Urmila
Class: B.Sc. III (6 Sem)
Subject: Physical Chemistry

Sr. No.	Week	Content
	01/01/24 – 15/01/24	PRACTICAL EXAMINATION
UNIT-1	16/01/24-20/1/24	**Solutions: Dilute Solutions and Colligative Properties** Ideal and non-ideal solutions, methods of expressing concentrations of solutions, activity and activity coefficient. Dilute solution, Colligative properties, Raolut's law,
	22/1/24 - 27/1/24	Relative Lowering of vapour pressure, molelcular weight determination, Osmosis law of osmotic pressure and its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point,
	29/1/24 - 03/2/24	Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties.
	05/02/24 - 10/02/24	Abnormal molar mass, degree of dissociation and association of solutes.
UNIT-2	12/02/24 - 17/02/24	**Photochemistry** Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry: Grotthus-Drapper law, Stark- Einstein law (law of photochemical equivalence)
	19/02/24 - 24/02/24	Jablonski diagram depiciting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing),
	26/02/24 - 02/03/24	Quantum yield, photosensitized reactions-energy transfer processes (simple examples).
	04/03/24 – 09/03/24	Test of unit 1 & 2
UNIT-3	11/03/24 – 16/03/24	**Spectroscopy-III** Electronic Spectrum Concept of potential energy curves for bonding and antibonding molecular orbitals,
	18/ 03/24 – 22/03/24	Qualitative description of selection rules and Franck-Condon principle.
	23/03/24 – 31/03/24	**HOLI BREAK**
	01/04/24 – 06/04/24	Qualitative description of sigma and pie and n molecular orbital (MO) their energy level and respective transitions.
UNIT-4	08/04/24 – 13/04/24	**Phase Equillibrium** Statement and meaning of the terms –phase component and degree of freedom,
	15/04/24 – 20/04/24	Thermodynamic derivation of Gibbs phase rule, phase equilibria

		of one component system–Example–water and Sulphur systems.
	22/04/24 – 27/04/24	Phase equilibria of two component systems solid-liquid equilibria, simple eutectic Example Pb-Ag system, de-silverisation of lead
	29/04/24 – 30/04/24	Test of unit 3 & 4
	01/05/24 - ONWARDS	EXAMINATIONS
	20/05/24 – 30/06/24	SUMMER BREAK

Prepared by:
Dr. Urmila
Assistant Professor Chemistry