

MAHARANA PRATAP MAHAVIDYALAYA, JUNGLE DHUSAN, GORAKHPUR
Chemistry Department

Class: B. Sc. IV Semester

LESSON PLAN (Theory) : 2024-25

Subject : Chemistry

Course Code : CHE 203

Course Title : Quantum Mechanics and Analytical Techniques

DATE	LECTURE	TEACHER'S NAME	CHAPTER	TOPIC
16/01/2025	1	Dr. Ram Sahay	Unit-II, Elementary Quantum Mechanics	De-Broglie hypothesis. Heisenberg uncertainty principle
17/01/2025	2	Dr. S. K. Vernwal	Unit-VII, Separation Techniques	General introduction of solvent extraction
18/01/2025	3	Mrs. Priyanka Mishra	Unit-VI(A), Volumetric Analysis	General principle of acid-base titrations, precipitation titrations
20/01/2025	4	Dr. Ram Sahay	Unit-II, Elementary Quantum Mechanics	Schrödinger wave equation (time dependent and time independent) and its importance
21/01/2025	5	Mrs. Divya Dubey	Unit-I, Atomic Structure	Atomic orbitals, Schrodinger wave equation
22/01/2025	CT	Mrs. Namrata Mishra	CT	Class Teaching
23/01/2025	6	Mrs. Divya Dubey	Unit-I, Atomic Structure	Atomic orbitals, Schrodinger wave equation
24/01/2025	7	Dr. S. K. Vernwal	Unit-VII, Separation Techniques	Classification, principle and efficiency of the technique
25/01/2025	8	Mrs. Priyanka Mishra	Unit-VI(A), Volumetric Analysis	Oxidation-reduction titrations, iodimetry and complexometric titrations
27/01/2025	9	Dr. Ram Sahay	Unit-II, Elementary Quantum Mechanics	Physical interpretation of the wave function
28/01/2025	10	Mrs. Divya Dubey	Unit-I, Atomic Structure	Atomic orbitals, Schrodinger wave equation
29/01/2025	ME	Mrs. Namrata Mishra	ME	Monthly Evaluation
30/01/2025	11	Dr. Ram Sahay	Unit-II, Elementary Quantum Mechanics	Schrödinger wave equation for H-atom
31/01/2025	12	Dr. S. K. Vernwal	Unit-VII, Separation Techniques	Mechanism of extraction: extraction by solvation and chelation
01/02/2025	13	Mrs. Priyanka Mishra	Unit-VI(A), Volumetric Analysis	Oxidation-reduction titrations, iodimetry and complexometric titrations
04/02/2025	14	Mrs. Divya Dubey	Unit-I, Atomic Structure	Significance of ψ and ψ^2 quantum numbers, Radial and angular wave functions and probability distribution curves, Shapes of s, p, d orbitals
05/02/2025	15	Mrs. Namrata Mishra	Unit-III(A), Molecular Spectroscopy	Introduction: Electromagnetic radiation, regions of the spectrum, basic features of different spectrometers
06/02/2025	CT	Mrs. Divya Dubey	CT	Class Teaching
07/02/2025	16	Dr. S. K. Vernwal	Unit-VII, Separation Techniques	Technique of extraction: batch, continuous and counter current extractions.
08/02/2025	17	Mrs. Priyanka Mishra	Unit-VI(A), Volumetric Analysis	Use of EDTA for the determination of Ca^{2+} and Mg^{2+} , Hardness of water
10/02/2025	18	Dr. Ram Sahay	Unit-II, Elementary Quantum Mechanics	Schrödinger wave equation for H-atom

MAHARANA PRATAP MAHAVIDYALAYA, JUNGLE DHUSAN, GORAKHPUR
Chemistry Department

11/02/2025	19	Mrs. Divya Dubey	Unit-I, Atomic Structure	Aufbau and Pauli exclusion principles, Hund's multiplicity rule
13/02/2025	20	Dr. Ram Sahay	Unit-II, Elementary Quantum Mechanics	Schrödinger wave equation for H-atom
14/02/2025	CT	Dr. S. K. Vernwal	CT	Class Teaching
15/02/2025	21	Mrs. Priyanka Mishra	Unit-VI(A), Volumetric Analysis	Use of EDTA for the determination of Ca^{2+} and Mg^{2+} , Hardness of water,
17/02/2025	22	Dr. Ram Sahay	Unit-II, Elementary Quantum Mechanics	Separation into three equations (without derivation) Bonding wave function, concept of σ , σ^* , π , π^* ,
18/02/2025	23	Mrs. Divya Dubey	Unit-VII, Errors and Evaluation	Definition of terms: mean and median, precision, standard deviation,
19/02/2025	24	Mrs. Namrata Mishra	Unit-III(A), Molecular Spectroscopy	Statement of the Born- Oppenheimer approximation, degrees of freedoms
20/02/2025	25	Mrs. Divya Dubey	Unit-VII, Errors and Evaluation	Definition of terms: mean and median, precision, standard deviation,
21/02/2025	ME	Dr. S. K. Vernwal	ME	Monthly Evaluation
22/02/2025	26	Mrs. Priyanka Mishra	Unit-VI(A), Volumetric Analysis	Types of EDTA titrations and metal ion indicators
24/02/2025	27	Dr. Ram Sahay	Unit-IV, UV-visible Spectroscopy	Origin of spectra
25/02/2025	28	Mrs. Divya Dubey	Unit-VII, Errors and Evaluation	Definition of terms: mean and median, precision, standard deviation,
27/02/2025	29	Dr. Ram Sahay	Unit-IV, UV-visible Spectroscopy	Interaction of radiation with matter
28/02/2025	30	Dr. S. K. Vernwal	Unit-VII, Separation Techniques	Qualitative and quantitative aspects of solvent extraction: extraction of metal ions from the aqueous non aqueous media
01/03/2025	CT	Mrs. Priyanka Mishra	CT	Class Teaching
03/03/2025	31	Dr. Ram Sahay	Unit-IV, UV-visible Spectroscopy	Fundamental laws of spectroscopy and selection rules
04/03/2025	32	Mrs. Divya Dubey	Unit-VII, Errors and Evaluation	Relative standard deviation, accuracy- absolute error, Types of error in experimental data determination (systematic), intermediate (or random) and gross
05/03/2025	33	Mrs. Namrata Mishra	Unit-III(A), Rotational Spectroscopy	Diatomic molecules. Energy levels of a rigid rotor (semi- classical principles)
06/03/2025	34	Mrs. Divya Dubey	Unit-VII, Errors and Evaluation	Relative standard deviation, accuracy- absolute error, Types of error in experimental data determination (systematic), intermediate (or random) and gross
07/03/2025	35	Dr. S. K. Vernwal	Unit-VII, Separation Techniques	Chromatography: Classification, principle and efficiency of the technique.
08/03/2025	CT	Mrs. Priyanka Mishra	CT	Class Teaching
10/03/2025	36	Dr. Ram Sahay	Unit-IV, UV-visible Spectroscopy	Types of electronic transitions
11/03/2025	37	Mrs. Divya Dubey	Unit-VII, Errors and Evaluation	Relative standard deviation, accuracy- absolute error, Types of error in experimental data determination (systematic), intermediate (or random) and gross

MAHARANA PRATAP MAHAVIDYALAYA, JUNGLE DHUSAN, GORAKHPUR
Chemistry Department

17/03/2025	38	Dr. Ram Sahay	Unit-IV, UV-visible Spectroscopy	λ_{max} , chromophore and auxochromes
18/03/2025	39	Mrs. Divya Dubey	Unit-VII, Errors and Evaluation	Sources of errors and the effects upon the analytical results, Methods for reporting analytical data, statistical evaluation and data-indeterminate errors, Use of statistics
19/03/2025	40	Mrs. Namrata Mishra	Unit-III(A), Rotational Spectroscopy	Selection rules, spectral intensity, distribution using population distribution (Maxwell- Boltzmann distribution)
20/03/2025	ME	Dr. Ram Sahay	ME	Monthly Evaluation
21/03/2025	41	Dr. S. K. Vernwal	Unit-VII, Separation Techniques	Mechanism of separation: adsorption, partition & ion exchange.
22/03/2025	42	Mrs. Priyanka Mishra	Unit-VI(A), Gravimetric Analysis	Precipitation from homogenous medium
01/04/2025	43	Mrs. Divya Dubey	Unit-VII, Errors and Evaluation	Sources of errors and the effects upon the analytical results, Methods for reporting analytical data, statistical evaluation and data-indeterminate errors, Use of statistics
02/04/2025	44	Mrs. Namrata Mishra	Unit-III(A), Molecular Spectroscopy	Determination of bond length, qualitative description of non-rigid rotor, isotope effect
03/04/2025	45	Mrs. Divya Dubey	Unit-V, Infrared Spectroscopy	Fundamental and non-fundamental molecular vibrations
04/04/2025	CT	Dr. S. K. Vernwal	CT	Class Teaching
05/04/2025	46	Mrs. Priyanka Mishra	Unit-VI(A), Gravimetric Analysis	purity of precipitates, co-precipitation, post-precipitation
07/04/2025	47	Dr. Ram Sahay	Unit-IV, UV-visible Spectroscopy	Bathochromic and Hypsochromic shifts, Intensity of absorption
08/04/2025	48	Mrs. Divya Dubey	Unit-V, Infrared Spectroscopy	Hooke's law, selection rule, IR absorption positions of various functional groups
09/04/2025	49	Mrs. Namrata Mishra	Unit-III(A), Vibrational Spectroscopy	Energy levels of simple harmonic oscillator
11/04/2025	50	Dr. S. K. Vernwal	Unit-VII, Separation Techniques	Mechanism of separation: adsorption, partition & ion exchange.
12/04/2025	CT	Mrs. Priyanka Mishra	CT	Class Teaching
15/04/2025	51	Mrs. Divya Dubey	Unit-V, Infrared Spectroscopy	Effect of H-bonding, conjugation, resonance and ring size on IR absorptions
16/04/2025	52	Mrs. Namrata Mishra	Unit-III(A), Vibrational Spectrum	Selection rules, pure vibrational spectrum, intensity, determination of force constant and qualitative relation of force constant and bond energies,
17/04/2025	53	Dr. Ram Sahay	Unit-IV, UV-visible Spectroscopy	Application of Woodward rules for calculation of λ_{max} for the conjugated dienes,
19/04/2025	54	Mrs. Priyanka Mishra	Unit-VI(A), Gravimetric Analysis	Washing and ignition of precipitates
21/04/2025	55	Dr. Ram Sahay	Unit-IV, UV-visible Spectroscopy	Alicyclic, homoannular and heteroannular extended conjugated systems
22/04/2025	CT	Mrs. Divya Dubey	CT	Class Teaching

MAHARANA PRATAP MAHAVIDYALAYA, JUNGLE DHUSAN, GORAKHPUR
Chemistry Department

23/04/2025	56	Mrs. Namrata Mishra	Unit-III(A), Spectroscopy	Vibrational	Effect of anharmonic motion and isotope on the spectrum, idea of vibrational frequencies of different functional groups.
24/04/2025	57	Mrs. Divya Dubey	Unit-V, Spectroscopy	Infrared	Application in functional group analysis
25/04/2025	58	Dr. S. K. Vernwal	Unit-VII, Techniques	Separation	Development of chromatograms: frontal, elution, and displacement methods.
26/04/2025	59	Mrs. Priyanka Mishra	Unit-VI(A), Analysis	Gravimetric	Contamination and their removal.
28/04/2025	60	Dr. Ram Sahay	Unit-IV, Spectroscopy	UV-visible	Distinction between cis and trans isomers
29/04/2025	ME	Mrs. Divya Dubey	ME		Monthly Evaluation
30/04/2025	61	Mrs. Namrata Mishra	Unit-III(A), Spectroscopy	Raman	Concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules.
