

Lesson Plan 2024-25 Even Semester (Semester-II)

DSC (NEP)

Name of the Assistant Professor: Dr. Vijay Kumar

Class: B.Sc. I

Semester: 2ND

Subject: Physics

Jan. 2025 Week-2	Extensive and intensive thermodynamic variables, Thermodynamic equilibrium,
Jan. 2025 Week-3	Zeroth law Concept of Temperature Work and heat
Jan. 2025 Week-4	State functions, First law of thermodynamics, Internal energy,
Feb. 2025 Week-1	Applications of first law, General relation between C_p and C_v ,
Feb. 2025 Week-2	Work done during isothermal and adiabatic processes. Unit-II Entropy and Third law of Thermodynamics: UNIT TEST
Feb. 2025 Week-3	Concept of entropy, Clausius theorem, Clausius Inequality, Second Law of Thermodynamics in terms of Entropy,
Feb. 2025 Week-4	Entropy of a Perfect Gas and Universe, Entropy Changes in Reversible and Irreversible Processes,
March. 2025 Week-1	Principle of Increase of Entropy, Third Law of Thermodynamics, Unattainability of absolute zero, T-S Diagrams,
March. 2025 Week-2	Phase Change, Classification of Phase Changes. Unit-III Thermodynamic Potentials: Extensive and Intensive.
March. 2025 Week-3	Thermodynamic Variables; Internal Energy; Definition, importance, properties and applications.
March. 2025 Week-4	Chemical Potential, Enthalpy, Gibbs function Helmholtz function
April. 2024 Week-1	Maxwell's Thermodynamic Relations: Derivations of Maxwell's Relations and their applications
April. 2024 Week-2	1) Clausius- Clapeyron equation (2) C_p C_v value,

April. 2024 Week-3	Energy equations, Change of temperature during adiabatic process. Van -der Waal's Equation of State for Real Gases
April. 2024 Week-4	TEST Revision



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Lesson Plan 2024-25 Even Semester (Semester-IV)

Name of the Assistant Professor: Dr. Vijay Kumar

Class: B.Sc. II

Semester: 4th

Subject: Physics

Jan. 2025 Week-2	Polarization of light & its representations, Polarization by reflection & scattering Law of Malus Phenomenon of double refraction Huygens's wave theory of double refraction
Jan. 2025 Week-3	Analysis of polarized light Nicol prism its Principle, working & physical significance Plane, Circularly & Elliptically polarized light, Difference between positive and negative crystal
Jan. 2025 Week-4	Explanation negative (Calcite) crystal Quarter and half wave plates Optical activity Fresnel's theory of rotation
Feb. 2025 Week-1	Specific rotation Polarimeters (half shade and biquartz) Revision and testing of the chapter Class Test
Feb. 2025 Week-2	Fourier theorem and Fourier series Evaluation of fourier coefficients Importance and limitations of fourier theorem Even and odd function of fourier series
Feb. 2025 Week-3	Fourier function with different limits Fourier function from $-L$ to $+L$ Complex form of fourier series Applications of fourier series to solve complex function Solution of triangular and rectangular wave problems
Feb. 2025 Week-4	Fourier function with different limits Fourier function from $-L$ to $+L$ Complex form of fourier series Applications of fourier series to solve complex function Solution of triangular and rectangular wave problems
March. 2025 Week-1	Half and full wave rectifier.output. Parseval identity for fourier series Some fourier integrals Unit revision and problems Testing of the chapter Class test Fourier transform and its properties Application of fourier transform for evaluation of integrals



March. 2025 Week-2	Fourier transform and its properties Application of fourier transform for evaluation of integrals Application to solution to ordinary differential equations Application to some special function Matrix method in paraxial optics
March. 2025 Week-3	Application to solution to ordinary differential equations Application to some special function Matrix method in paraxial optics Effect in translation and refraction Derivation of thin & thick lens formula
March. 2025 Week-4	Unit plane, Nodal plane, system of thin lenses Chromatic aberrations, Spherical aberrations Coma aberrations, Astigmatism aberrations Distortion aberrations and their remedies
April. 2024 Week-1	Fibre optics Critical angle of propagation Mode of propagation Acceptance angle Fractional refractive index Numerical aperture Type of optical fibre, Normalized frequency Pulse dispersion, Attenuation and its application
April. 2024 Week-2	Fibre optics communication and its disadvantage Revision and testing of the chapter Microscope and macro specific system, events dependent & independent Statistical probability, a priori probability and relations Probability and some considerations Combinations possessing minimum and maxi. probability Tossing of coin , permutation and combinations
April. 2024 Week-3	Micro & macro state, thermodynamically probability Entropy and probability , distribution of particles of different size Statistical physics, phase space & its division in to cell Kind of statistics, MB statistics Speed and velocity distribution law Average and r.m.s. sped & velocity expression Most probable energy & mean energy for MB Distribution. Quantum statistics & B.E. distribution law and its application
April. 2024 Week-4	F.D. statistics law & energy distribution and Comparison of three statistics Fermi energy and temperature, energy & degeneracy Zero point energy, F.D. Statistics distribution for electron gas Dulong and petit law & its derivation Einstein theory of specific heat Criticism of Einstein theory of specific heat Debye models of specific heat of solids & its shortcoming Comparison of Einstein & Debye models

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Lesson Plan 2024-25 Even Semester (Semester-VI)

Name of the Assistant Professor: Dr.Vijay Kumar

Class: B.Sc. III

Semester: 6th

Subject: Physics

Jan. 2025 Week-2	Unit – I: Historical background of atomic spectroscopy
	Introduction of early observations, emission and absorption spectra
	Wave number, Spectrum of Hydrogen atom in Balmer series,
	Spectra of Hydrogen atom , Bohr atomic model(Bohr's postulates) ,
	Un-quantized states and continuous spectra,
Jan. 2025 Week-3	Explanation of spectral series in Hydrogen atom,
	Spectral series in absorption spectra,
	Effect of nuclear motion on line Spectra (correction of finite nuclear mass),
	Variation in Rydberg constant due to finite mass,
Jan. 2025 Week-4	Shortcomings of Bohr's theory,
	Wilson Sommerfeld Quantization Rule
	De-Broglie Interpretation Of Bohr Quantization Law
	Bohr's Corresponding Principle,
	Sommerfeld's Extension Of Bohr's Model
Feb. 2024 Week-1	Sommerfeld Relativistic Correction
	Short Comings Of Bohr-Sommerfeld Theory
	Vector Atom Model; Space Quantization
	Electron Spin, Coupling Of Orbital And Spin Angular Momentum
	Spectroscopic Terms And Their Notation
	Quantum Numbers Associated With Vector Atom Model,
	Transition Probability And Selection Rules.
Feb. 2024 Week-2	Short Comings Of Bohr-Sommerfeld Theory
	Unit –II: Vector Atom Model (Single Valance Electron)
	Orbital Magnetic Dipole Moment (Bohr Megnaton),
	Behavior of Magnetic Dipole Larmors' Precession and Theorem
	Penetrating and Non-Penetrating Orbits
	Penetrating Orbits on The Classical Model; Quantum Defect
	Spin Orbit Interaction Energy of The Single Valance Electron
Feb. 2024 Week-3	Spin Orbit Interaction for Penetrating And Non-Penetrating Orbits.
	Hydrogen Fine Spectra, Main Features of Alkali Spectra
	Term Series And Limits, Rydeburg-Ritze Combination Principle
	Absorption Spectra of Alkali Atoms
	Observed Doublet Fine Structure in The Spectra of Alkali Metals
	Intensity Rules For Doublets
	Comparison of Alkali Spectra and Hydrogen Spectrum
Feb. 2024 Week-4	Quantum Mechanical Relativity Correction
	UNIT-III: Vector Atom Model (Two Valance Electrons) Essential Features Of Spectra Of Alkaline-Earth Elements, Vector Model For Two Valance electron Atom: Application Of Spectra. Coupling Schemes; LS Or Russell – Saunders Coupling Scheme And JJ Coupling Scheme, Interaction Energy In L-S Coupling (Sp, Pd Configuration), Lande Interval Rule, Pauli Principal And Periodic Classification Of The Elements.

March-2024 Week-1	<p>Interaction Energy In JJ Coupling (Sp, Pd Configuration), Equivalent And Non-Equivalent Electrons, Two Valance Electron System-Spectral Terms Of Non-Equivalent And Equivalent Electrons, Comparison Of Spectral Terms In L-S And J-J Coupling. Hyperfine Structure Of Spectral Lines And Its Origin; Isotope Effect, Nuclear Spin. Rivision of chapter and Session Test,</p> <p>Unit –IV: Atom In External Field Zeeman Effect (Normal And Anomalous), Experimental Set-Up For Studying Zeeman Effect,</p>
March-2024 Week-2	<p>Explanation Of Normal Zeeman Effect (Classical And Quantum Mechanical), Explanation Of Anomalous Zeeman Effect(Lande G-Factor), Zeeman Pattern Of D1 And D2 Lines Of Naatom, Paschen-Back Effect Of A Single Valance Electron System. Weak Field Stark Effect Of Hydrogen Atom</p> <p>Molecular Physics General Considerations, Electronic States Of Diatomic Molecules, Rotational Spectra (Far Ir And Microwave Region), Vibrational Spectra (Ir Region), Rotator Model Of Diatomic Molecule, Raman Effect, Electronic Spectra</p>
March-2024 Week-3	<p>Unit I: Crystal Structure I Crystalline and glassy forms, liquid crystals, crystal structure, periodicity, lattice and basis, crystal translational vectors and axes. Unit cell and Primitive Cell, Winger Seitz primitive Cell, symmetry operations for a two dimensional crystal, Bravais lattices in two and three dimensions. Crystal planes and Miller indices, Interplaner spacing, Crystal structures of Zinc Sulphide, Sodium Chloride and Diamond.</p>
April-2024 Week-1	<p>Unit II: Crystal Structure II, X-Ray Diffraction, Bragg's Law And Experimental, X-Ray Diffraction Methods. K-Space And Reciprocal Lattice And Its Physical Significance, Reciprocal Lattice Vectors, Reciprocal Lattice To A Simple Cubic Lattice, B.C.C. And F.C.C.</p>
April-2024 Week-2	<p>Unit III: Super conductivity Historical introduction, Survey of superconductivity, Super conducting systems, High Tc Super conductors, Isotopic Effect, Critical Magnetic Field, Meissner Effect, London Theory and Pippards' equation, Classification of Superconductors (type I and Type II),</p>
April-2024 Week-3	<p>BCS Theory of Superconductivity, Flux quantization, Josephson Effect (AC and DC), Practical Applications of superconductivity and their limitations, power application of superconductors.</p> <p>Unit IV: Introduction to Nano Physics Definition, Length scale, Importance of Nano-scale and technology</p>
April-2024 Week-4	<p>History of Nantechnology, Benefits and challenges in molecular manufacturing Molecular assembler concept, Understanding advanced capabilities. Vision and objective of Nano-technology, Nanotechnology in different field, Automobile, Electronics, Nano-biotechnology, Materials, Medicine. Revision of chapter Revision and testing of the chapter</p>




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