

GOVERNMENT COLLEGE BIROHAR (JHAJJAR)

Summary of Lesson Plans of College Faculty for Academic Session 2024- 2025

Name of Assistant/Associate Professor: Dr. Jai Parkash Sharma
 Class & Sem.: B.Sc IInd & IIIrd sem Subject: Physics (Atomic, Molecular and Laser)

Months	Topics/Chapters to be Covered
Jan 2025	Vector Atom model, quantum numbers Penetrating and non-penetrating orbits Spectral lines in different series of alkali spectra Spin orbit interaction and doublet term Separation LS, Russel Saunders Coupling jj coupling.
Feb 2025	Zeeman effect, Zeeman pattern of D₁ and D₂ lines of Na-atom, Paschen Back effect of a single valence electron system. Weak field Stark effect of Hydrogen atom Discrete set of electronic energies of molecules quantisation of Energy
March 2025	Quantisation of Vibrational and rotational energies Raman effect Stokes and anti-Stokes lines Unit Test - Assignment Laser Main features of a laser Directionally, high intensity, high degree of coherence, spatial and temporal coherence
April 2025	Einstein's coefficients and possibility of amplification Momentum Transfer Laser emission, laser pumping, He-Ne Laser, Ruby Laser → Principle, Working Construction Unit Test, Assignment

Jai Parkash
 Signature of Asst/Asso. Professor

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Name of Assistant/Associate Professor: Dr. Tai Parashat Sharma
 Class & Sem.: B.Sc. Hons. 6th Sem Subject: Physics (Nuclear Physics)

Months	Topics/Chapters to be Covered
Jan 2025	Nuclear mass and binding Energy Nuclear stability, Nuclear size, Spin, parity Statistics, magnetic dipole moment Determination of mass by Bain-Bridge, Jordan mass spectrograph Determination of charge by Massey Low Rutherford Back Scattering
Feb 2025	Interaction of charged particles, α , β , γ Interaction of heavy charged particles - (Alpha) Alpha particles $\rightarrow$ Disintegration, Theory, Energy loss, Range Beta particles $\rightarrow$ Disintegration, Theory, Energy loss, Range Gamma Rays $\rightarrow$ Nature, Energetics of gamma rays Photoelectric, Compton and pair production effects Absorption of Gamma rays and its Application
March 2025	Unit Test No-1 Assignment, Practical work Nuclear Reaction Nuclear reactions, Elastic scattering, Inelastic scattering, Nuclear disintegration, photonuclear reactions, Radiative capture, Direct reaction Heavy ion reactions, Conservation Law, Q-value Nuclear Reactors General aspects of Reactor design, Nuclear fusion fusion (Fusion), heavy construction and use
April 2025	Linear accelerator Tandem accelerator, cyclotron and Betatron Ionization chamber, proportional counter G.M. Counter, Counter detailed study, Semiconductor detector Unit Test, Assignment

Tai Parashat Sharma
 Signature of Asst/Asso. Professor

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Name of Assistant/Associate Professor: Dr. Jai Pardeep Sharma

Class & Sem.: B.Sc 2nd, 4th Subject: Physics (Statistical Mechanics)

Months	Topics/Chapters to be Covered
Jan 2025	<u>Probability</u> :- Probability, some Probability constants Combinations possessing maximum probability minimum probability Distribution of molecules in two boxes. Case with weightage, phase space microstates and macrostates Statistical fluctuations, constraints and accessible States Thermodynamical probability.
Feb 2025	Postulates of Statistical Physics, Division of Phase space into cells, Conditions of equilibrium between two system in thermal contact, β-Parameter Entropy and Probability, Boltzmann's distribution Law, Evaluation of A and b
March 2025	Bose-Einstein Statistics, Application of B.E. Statistics to Planck's radiation Law Bose-Einstein (B.E) gas Unit Test, Assignment Fermi-Dirac Statistics, M.B. Law as Limiting case of B.E.
April 2025	B.E Degeneracy and B.E condensation. F.D gas, electron gas in metals, zero point energy, specific heat of metals and its solution Unit Test Assignment

Jai Pardeep

Signature of Asst/Asso. Professor