**Lesson Plan of January to April 2023-2024**

Name of the Assistant/ Associate Professor: Dr. Chanchal

Class: B.Sc.2nd semester

Subject: Paper I- PHY 201 : PROPERTIES OF MATTER, KINETIC THEORY AND RELATIVITY

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| Month | Topic |
| JANUARY | Unit - I Properties of Matter (Elasticity) : Elasticity, Hooke’s law, Elastic constants and their relations, Poisson’s ratio, torsion of cylinder and twisting couple. Bending of beam (bending moment and its magnitude) cantilevers, Centrally loaded beam  **Presentation ,Revision and Test** |
| FEBRUARY | Unit - II Kinetic Theory of Gases : Assumptions of Kinetic Theory of gases, Law of equipartition of energy and its applications for specific heats of gases. Maxwell distribution of speeds and velocities (derivation required),  **Presentation**  **Revision and Test** |
| MARCH | Experimental verification of Maxwell’s Law of speed distribution : most probable speed, average and r.m.s. speed, mean free path. Transport of energy and momentum, diffusion of gases. Brownian motion (qualitative), Real gases, Van der Waal’s equation..  Unit - III Theory of Relativity : Reference systems, inertial frames, Gallilean invariance and Conservation laws, Newtonian relativity principle,  **Presentation Revision and Test** |
| APRIL | Michelson - Morley experiment : Search for ether. Lorentz transformations length contraction, time dilation, velocity addition theorem, variation of mass with velocity and mass energy equivalence..**Presentation Revision and Test** |

**Lesson Plan of January to April 2024**

Name of the Assistant/ Associate Professor: Dr. Chanchal

Class and Section: B.Sc. 6th semester

Subject: Paper II- PHY 602: Nuclear Physics

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| Month | Topic |
| JANUARY | Unit-I  Nuclear mass and binding energy, systematics nuclear binding energy, nuclear stability, Nuclear size, spin, parity, statistics magnetic dipole moment, quadrupole moment (shape concept), Determination of mass by Bain-Bridge, Bain-Bride and Jordan mass spectrograph Unit-II  Interaction of heavy charged particles (Alpha particles), alpha disintegration and its theory Energy loss of heavy charged particle (idea of Bethe formula, no derivation), Energetics of alpha - decay, Range and straggling of alpha particles. Geiger-Nuttal law. Introduction of light charged particle (Beta-particle),  **Presentation Revision and Test** |
| FEBRUARY | Origin of continuous beta- spectrum (neutrino hypothesis) types of beta decay and energetics of beta decay, Energy loss of beta- particles (ionization), Range of electrons, absorption of beta-particles. Interaction of Gamma Ray, Nature of gamma rays, Energetics of gamma rays, passage of Gamma radiations through matter (photoelectric, compton and pair production effect) electron position anhilation. Asborption of Gamma rays (Mass attenuation coefficient) and its application.  Presentation Revision and Test  **Presentation Revision and Test** |
| MARCH | Unit-III  Nuclear reactions, Elastic scattering, Inelastic scatting, Nuclear disintegration, photoneclear reaction, Radiative capture, Direct reaction, heavy ion reactions and spallation Reactions, conservation laws. Q-value and reaction threshold. Nuclear Reactors General aspects of Reactor design.  **Presentation Revision and Test** |
| APRIL | Nuclear fission and fusion reactors (Principles, construction, working and use) Linear accelerator, Tendem accelerator, Cyclotron and Betatron accelerators. Ionization chamber, proportional counter, G.M. counter detailed study, scintillation counter and semiconductor detector.  **Presentation Revision and Test** |

**Lesson Plan of January to April 2023-2024**

Name of the Assistant/ Associate Professor: Dr. Chanchal

Class: B.Sc.4th semester

Subject: Paper I- PHY 401 : Statistical Mechanics

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| Month | Topic |
| JANUARY | Unit-I Probability, some probability considerations, combinations possessing maximum probability, combinations possessing minimum probability, distribution of molecules in two boxs. Case with weightage (general). Phase space, microstates and macrostates, statistical fluctuations constraints and accessible States Thermodynamical probability. **Presentation ,Revision and Test** |
| FEBRUARY | Unit-II Postulates of Statistical Physics. Division of Phase space into cells, Condition of equilibrium between two system in thermal contact. b-Parameter. Entropy and Probability, Boltzman’s distribution law.  **Presentation**  **Revision and Test** |
| MARCH | Evaluation of A and b. Bose-Einstein statistics, Application of B.E. Statistics to Plancks’s radiation law, B.E. gas.  **Presentation Revision and Test** |
| APRIL | Unit-III Fermi-Dirac statistics, M.B. Law as limiting case of B.E. Degeneracy and B.E., Condensation. F.D. Gas, electron gas in metals. Zero point energy. Specific heat of metals and its solution **Presentation Revision and Test** |