

Government College, Mangali

LESSON PLAN- ODD SEMESTER

Name of Teacher : Dr. Manjeet Singh		Session: 2023-24	
Subject: Physics Class: B. Sc. 1st Semester		Nomenclature of Paper: MECHANICS-I	
Week	YEAR-2023	Description of Chapter/Topic	Assignment/Test/Quiz/Practical
1	24 JUL-29 JUL	UNIT-1 Scalar and vector fields, Derivatives of a vector with respect to a parameter	
2	31 JUL -05 AUG	Gradient of a scalar field and its geometrical interpretation , Divergence and curl of a vector field, Laplacian operator	
3	07 AUG-12 AUG	Vector identities, Line, surface and volume integrals of Vector fields	
4	14 AUG-19 AUG	Flux of a vector field, Gauss's divergence theorem, Stokes Theorem and their applications	
5	21 AUG -26 AUG	UNIT-2 Time derivative of vectors with examples , Concepts of cartesian, polar and spherical coordinates	
6	28 AUG - 02 SEP	Motion in plane Polar Coordinates, velocity and acceleration in polar coordinates , Dynamics Using Polar Coordinates	
7	04 SEP - 09 SEP	Momentum, Conservation of momentum, Centre of mass, Centre of mass coordinates	
8	11 SEP -16 SEP	Motion of rockets , Work and energy, Conservation of energy	
9	18 SEP -23 SEP	UNIT-3 Elastic and inelastic collisions between particles , Centre of Mass and Laboratory frames	
10	25 SEP- 30 SEP	Angular velocity and angular momentum , Moment of inertia and parallel and perpendicular axis theorem	
11	02 OCT -07 OCT	Moment of inertia of (a) thin uniform wire (b) Thin rectangular sheet (c) Rectangular slab (d) ring (e) disc (f) spherical shell (g) solid sphere (h) hollow sphere, Torque , Conservation of angular momentum , Angular momentum as vector	
12	09 OCT- 14 OCT	Coriolis forces and its effect on motion	
13	16 OCT- 21 OCT	UNIT-4 Basics properties of central forces, Two body problem equivalent to one body problem	
14	23 OCT -28 OCT	concept of reduced mass, Motion of a particle in a central force field	
15	30 OCT- 09 NOV	Hooke's law - Stress-strain diagram - Elastic moduli, Poisson's Ratio, Relation between four elastic constants	
16		DIWALI VACATION	
17	17 NOV- 25 NOV	Bending moments, Bending of cantilever and centrally loaded beams	
18	27 NOV	REVISION PRACTICE/TEST/ASSIGNMENTS	

Name of Teacher: Dr. Manjeet Singh		Class: B. Sc. 1st Semester	Session: 2023-24
Subject: Physics		Nomenclature of Paper: Electricity and Magnetism-I	Paper Code: CPL-103
Week	YEAR-2023	Description of Chapter/Topic	Assignment/Test/Quiz/Practical
1	24 JUL-29 JUL	UNIT-1 Electrostatics: Electrostatic Field, Electric flux	
2	31 JUL -05 AUG	Gauss's theorem of electrostatics, Applications of Gauss theorem , Divergence and curl of electrostatic field and their physical significance	
3	07 AUG-12 AUG	Electric potential, Electric potential as line integral of electric field , Calculation of electric field from potential, Energy stored in electrostatic field per unit volume	
4	14 AUG-19 AUG	UNIT-2 Application of Electrostatics: Laplace and Poisson's equations for the electrostatic field , Multi-pole expansion of potential due to arbitrary charge distribution	
5	21 AUG -26 AUG	Dielectric medium, Polarization , Bound charges in a polarized dielectric and their physical interpretation	
6	28 AUG - 02 SEP	Electric displacement, Gauss's theorem in dielectrics , Parallel plate capacitor completely filled with dielectric	
7	04 SEP - 09 SEP	Susceptibility, Permittivity and dielectric constants and numericals	
8	11 SEP -16 SEP	UNIT-3 Magnetism: Lorentz force law, Magnetic forces , Divergence and curl of magnetic field .	
9	18 SEP -23 SEP	Magnetostatics: BiotSavart's law & its applications (1) straight conductor (2) circular coil (3) solenoid carrying current,	
10	25 SEP- 30 SEP	Ampere's circuital law and it's applications for simple current configurations , Magnetic vector potential	
11	02 OCT -07 OCT	UNIT-4 Magnetization: The field of a magnetized object, bound currents, physical interpretation of bound currents.	
12	09 OCT- 14 OCT	The Auxiliary field (H) ,Magnetic properties of materials, Permeability, Magnetic susceptibility, diamagnetism, para-magnetism and numericals	
13	16 OCT- 21 OCT	ferromagnetism, B-H Curve , Currie point	
14	23 OCT -28 OCT	Ampere's law for magnetized objects and practice test	
15	30 OCT- 09 NOV	REVISION PRACTICE/TEST/ASSIGNMENTS	

Name of the Teacher: Dr. Manjeet Singh		Class: BSc 3rd Semester	Session : 2023-24
Subject: Physics		Nomenclature of Paper: Heat & Thermodynamics	Paper Code: CPL-302
Week	YEAR-2023	Description of Chapter/Topic	Assignment/Test/Quiz/Practical
1	24 JUL-29 JUL	UNIT-1 Zeroth and First Law of Thermodynamics: Extensive and intensive thermodynamic variables, Thermodynamic equilibrium, Zeroth law and Concept of Temperature	
2	31 JUL -05 AUG	Work and heat, State functions, First law of thermodynamics, Internal energy, Applications of first law.	
3	07 AUG-12 AUG	General relation between C_p and C_v , Workdone during isothermal and adiabatic Processes.	
4	14 AUG-19 AUG	Second Law of Thermodynamics: Reversible and Irreversible process with examples, Conversion of Work into Heat and Heat into Work, Heat Engines.	
5	21 AUG -26 AUG	Carnot's Cycle, Carnot engine & efficiency, Refrigerator & Coefficient of performance.	
6	28 AUG - 02 SEP	2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence, Carnot's Theorem	
7	04 SEP - 09 SEP	UNIT-2 Entropy and Third law of Thermodynamics: Concept of entropy, Clausius theorem, Clausius Inequality, Second Law of Thermodynamics in terms of Entropy	
8	11 SEP -16 SEP	Entropy of a Perfect Gas and Universe, Entropy Changes in Reversible and Irreversible Processes, Principle of Increase of Entropy, Third Law of Thermodynamics	
9	18 SEP -23 SEP	Revision Practice	
10	25 SEP- 30 SEP	T-S Diagrams, Phase Change, Classification of Phase Changes	
11	02 OCT -07 OCT	UNIT-3 Thermodynamic Potentials :- Extensive and Intensive Thermodynamic Variables, Internal Energy, Enthalpy, Gibbs, Helmholtz function and Their definitions	
12	09 OCT- 14 OCT	Properties and Applications : Maxwell's Thermodynamic Relations: - Derivations of Maxwell's Relations, Applications of Maxwell's Relations: (1) Clausius Clapeyron equation (2) Values of $C_p - C_v$, (3) Energy equations (4) Change of temperature during adiabatic process.	
13	16 OCT- 21 OCT	UNIT-4 Real gases: - Behaviour of Real Gases, Deviations from the Ideal Gas Equation. The Virial Equation, Critical .	
14	23 OCT -28 OCT	Constants. Continuity of Liquid and Gaseous State. Vapour and Gas, Boyle Temperature, Van der Waal's Equation of State for Real Gases. Values of Critical Constants.	
15	30 OCT- 09 NOV	Law of Corresponding States. Comparison with Experimental Curves, p-V Diagrams, Joule's Experiment, Free Adiabatic Expansion of a Perfect Gas	

Name of Teacher: Dr. Manjeet Singh		Class: B. Sc. 3rd Semester	Session: 2023-24
Subject: Physics		Nomenclature of Paper: Semiconductor Devices	Paper Code: CPL-303
Week	YEAR-2023	Description of Chapter/Topic	Assignment/Test/Quiz/Practical
1	24 JUL-29 JUL	UNIT-1 Semiconductor Diodes and applications: p and n type semiconductors. Barrier Formation in PN Junction Diode, Drift and Diffusion Currents. Current flow mechanism in Forward and Reverse biased PN Junction Diodes mentioning the roles of drift and diffusion currents.	
2	31 JUL -05 AUG	V-I characteristics of PN Junction Diode, Static and Dynamic Resistance, Applications of PN Junction Diode as Half-wave rectifier, Full-wave Rectifier (both center-tapped and bridge FWR)	
3	07 AUG-12 AUG	Calculation of ripple factor and rectification efficiency, Zener Diode, Applications of Zener Diode as DC voltage Regulator, Principle and structure of LEDs, Photodiode, Solar Cell	
4	14 AUG-19 AUG	UNIT-2 Semiconductor Transistors: Bipolar Junction transistors: n-p-n and p-n-p Transistors, Biasing of transistors in Active, Cutoff, and Saturation Modes,	
5	21 AUG -26 AUG	Circuit configurations of CB ,CE and CC transistors,	
6	28 AUG - 02 SEP	Characteristics of transistors in CB,CE and CC.	
7	04 SEP - 09 SEP	Current gains α and β . Relations between α and β , Current gain and power gain, DC Load line and Q- point,	
8	11 SEP -16 SEP	UNIT-3 Amplifiers and Their Biasing: Voltage Divider Bias Circuit for CE Amplifier.	
9	18 SEP -23 SEP	Bias stabilization, Class-A, B&C amplifiers, RC coupled amplifiers and its frequency response.	
10	25 SEP- 30 SEP	Feedback in amplifiers, positive and negative feedback in amplifiers, Advantages of negative feedback in amplifiers.	
11	02 OCT -07 OCT	Sinusoidal Oscillators: Barkhausen's Criterion for Self-sustained oscillations, Circuit and working of Hartley oscillator. Circuit and working of Colpit's oscillator, Uses of oscillator.	
12	09 OCT- 14 OCT	UNIT-4 Operational Amplifiers (Black Box approach): Qualitative idea of differential amplifier, CMRR, Characteristics of an Ideal and Practical Op-Amp (IC 741)	
13	16 OCT- 21 OCT	Open-loop& Closed-loop Gain. concept of Virtual ground, Applications of Op-Amps as Inverting Amplifier	
14	23 OCT -28 OCT	Noninverting Amplifier, Differentiator, Integrator.	
15	30 OCT- 09 NOV	REVISION PRACTICE/TEST/ASSIGNMENTS	

Name of the Teacher: Dr. Manjeet Singh		Class: B.Sc. 5th Semester		Session: 2023 -24	
Subject: Physics		Nomenclature of Paper: Elements of Modern Physics		Paper Code: CPL-501	
Week	YEAR-2023	Description of Chapter/Topic	Assignment/Test/Quiz/Practical		
1	24 JUL-29 JUL	UNIT-1 Properties of Thermal Radiation, Spectral Distribution of Blackbody Radiation,			
2	31 JUL -05 AUG	Kirchhoff's Law, Stefan-Boltzmann Law and Wien's Distribution and Displacement law, Rayleigh-Jean's Law,			
3	07 AUG-12 AUG	Photo-electric effect and Compton scattering; Pair production and annihilation,			
4	14 AUG-19 AUG	Bremsstrahlung effect, Cherenkov radiation, Production of X-rays.			
5	21 AUG -26 AUG	UNIT-2 Drawbacks of Rutherford model, Bohr atomic model; Bohr's quantization rule and atomic stability;			
6	28 AUG - 02 SEP	Calculation of energy levels for hydrogen like atoms and their spectra, Effect of nuclear mass on spectra, Correspondence principle.			
7	04 SEP - 09 SEP	Frank-Hertz, Davison and Germer experiment, phase velocity, group velocity and their relations			
8	11 SEP -16 SEP	UNIT-3 Heisenberg Uncertainty Principle; Estimating minimum energy of a confined particle using uncertainty principle;			
9	18 SEP -23 SEP	Revision Practice			
10	25 SEP- 30 SEP	Energy-time uncertainty principle, Properties of wave-function, Physical Interpretation of wave-function			
11	02 OCT -07 OCT	Schrodinger Equation: Momentum and Energy operators, Stationary states, Physical interpretation of a wave function			
12	09 OCT- 14 OCT	Stationary states, Physical interpretation of a wave function probabilities and normalization, Schrodinger Equation, Particle in 1-dimension infinite potential well.			
13	16 OCT- 21 OCT	UNIT-4 Absorption and emission of radiation, Basic feature of LASER, Population inversion; Resonance cavity; laser pumping; threshold condition for laser emission; Einstein's Co-efficient,			
14	23 OCT -28 OCT	3 level and 4 level system, Basic principle and working of He-Ne LASER			
15	30 OCT- 09 NOV	Revision Practice			

Name of the Teacher: Dr. Manjeet Singh**Class: B.Sc. 5th Semester****Session: 2023 -24****Subject: Physics****Nomenclature of Paper: Nuclear Physics****Paper Code: CPL-502**

Week	YEAR-2023	Description of Chapter/Topic	Assignment/Test/Quiz/Practical
1	24 JUL-29 JUL	UNIT-1 Nuclear composition, Nuclear properties; Nuclear mass, size, spin, parity, magnetic dipole moment, quadrupole moment (shape concept)	
2	31 JUL -05 AUG	Binding energy, nuclear binding energy curve, Radioactivity: Law of Radioactive Decay, Half-life, Radioactive Series	
3	07 AUG-12 AUG	α -decay: Range of α -particles, GeigerNuttal law and α -particle Spectra, β -decay, Energy Spectra and Neutrino Hypothesis, γ -decay : Origin of γ -ray	
4	14 AUG-19 AUG	UNIT-2 Similarity between nuclear matter and liquid drop, Liquid Drop Model, Semi-classical Mass formula, Limitations of liquid drop model	
5	21 AUG -26 AUG	Magic number, Experimental signature of shell structure in nuclei	
6	28 AUG - 02 SEP	Nuclear Shell Model (qualitative only) and its application, Meson Theory of Nuclear Forces.	
7	04 SEP - 09 SEP	UNIT-3 Interaction of heavy charged particles (Proton & Alpha Particle, Energy loss of heavy charged particle, Range of alpha particles	
8	11 SEP -16 SEP	Interaction of light charged particle (Betaparticle), Interaction of Gamma Ray	
9	18 SEP -23 SEP	Revision Practice	
10	25 SEP- 30 SEP	Passage of Gamma radiations through matter (Photoelectric, Compton and pair production effect), Absorption of Gamma rays	
11	02 OCT -07 OCT	Types of nuclear reactions, Concept of reaction cross-section, Concept of Compound and Direct Reactions.	
12	09 OCT- 14 OCT	UNIT-4 Gas filled counters; Ionization chamber, proportional counter, G.M. Counter (detailed study), Basic principle of scintillation counter and semiconductor detectors.	
13	16 OCT- 21 OCT	General aspects of reactor design, Nuclear fission reactor (Principle, construction, working and use)	
14	23 OCT -28 OCT	Particle Accelerator facilities in India, Linear Accelerator, Cyclotron, Synchrotron	
15	30 OCT- 09 NOV	Revision Practice	