

Govt. College for Women, Sonipat

Lesson Plan (2023-2024)

Name: Vikas Malik

Class: B.Sc. (Comp. Sci.) Ist (Sem2)

Subject: Physics

Properties of Matter and Kinetic Theory of Gases

15 Jan To 20 Jan	Introduction to moment of inertia and related terms, calculation of moment of inertia for some simple objects
22 Jan To 27 Jan	Theorem of parallel and perpendicular axis, MOI of solid sphere, hollow sphere
29 Jan To 03 Feb	MOI of spherical shell, hollow cylinder, solid bar and acceleration of rolling body down inclined plane
5 Feb To 10 Feb	Related problems of unit 1 and basics of elasticity and related terms. Hooke's law, elastic constants and their relations
12 Feb To 17 Feb	Poisson ratio, torsion of cylinder and twisting couple
19 Feb To 24 Feb	Bending of beam, bending moment, Cantilever CLASS TEST OF UNIT 1
26 Feb To 02 March	Cantilever loaded at different position and calculation of bending moment, idea of kinetic theory of gases
04 March To 09 March	Assumptions of kinetic theory of gases, pressure of ideal gas, kinetic interpretation of temperature, ideal gas equation
11 March To 16 March	Degree of freedom, equipartition law of energy and specific heat of gas, real gas, vanderwall equation
18 March To 23 March	Brownian motion, Maxwell distribution of speed and velocities and interpretation of results
25 March To 30 March	Holi break Assignment and revision of unit 2
01 April To 06 April	Experimental verification of Maxwell speed distribution, calculation of most probable, average, root mean square speed
08 April To 13 April	Mean free path, transport of energy Class test of unit 2
15 April To 20 April	Transport of momentum, diffusion of gases

GOVT. COLLEGE FOR WOMEN, SONEPAT

NAME OF FACULTY:- Vikus Malik SUBJECT:- Physics (Semiconductor Devices)

ACADEMIC SESSION:- 2023-2024 SEM: 2nd

CLASS:- Bsc. I (Comp. Sci.)

15 Jan To 20 Jan	Energy band in solids, Intrinsic and extrinsic semiconductors, Zener and avalanche breakdown
22 Jan To 27 Jan	Photoconduction in semiconductors, photodiode, solar cell
29 Jan To 03 Feb	Half wave and full wave rectifier, Zener diode as voltage regulator.
5 Feb To 10 Feb	Light emitting diodes, CLASS TEST OF UNIT 1, Junction transistors
12 Feb To 17 Feb	Working of NPN and PNP transistors in CB, CE and CC modes. Constants of a transistor.
19 Feb To 24 Feb	Relation between gain coefficients, CB, CE and CC characteristics of a transistor. Advantages and disadvantages of CE configuration.
26 Feb To 02 March	Numerical problems on transistors, Assignment 1, Transistor Biasing.
04 March To 09 March	Methods of transistor biasing, DC load line, common base and common emitter transistor amplifiers
11 March To 16 March	Classification of amplifiers, RC coupled amplifier, feedback in amplifiers.
18 March To 23 March	Advantages of negative feedback, emitter follower circuit, introduction to oscillators.
25 March To 30 March	Holi Break
01 April To 06 April	Classification of oscillators, condition of self sustained oscillations Barkhausen criterion of oscillations, Class test of unit 2.
08 April To 13 April	Tuned oscillators, Hartley oscillator. Revision of oscillators.
15 April To 20 April	C.R.O. principle and working. Problems regarding the syllabus.



GOVT. COLLEGE FOR WOMEN, SONEPAT

NAME OF FACULTY:- Vikas Malik

SUBJECT:- Physics (Statistical Physics)

ACADEMIC SESSION:- **2023-2024**

SEM: **4th**

CLASS:- Bsc. II (Comp. Sci.)

15 Jan To 20 Jan	Probability, some probability considerations.
22 Jan To 27 Jan	Combinations possessing maximum probability and combinations possessing minimum probability
29 Jan To 03 Feb	Distribution of molecules in two boxes. Case with weightage (general).
5 Feb To 10 Feb	Phase space, microstates and macrostates with suitable examples.
12 Feb To 17 Feb	Statistical fluctuations constraints and accessible, States Thermodynamical probability.
19 Feb To 24 Feb	Postulates of Statistical Physics. Division of Phase space into cells Condition of equilibrium between two system in thermal contact.
26 Feb To 02 March	B-Parameter Entropy and Probability, Boltzman's distribution law.
04 March To 09 March	Evaluation of A and b. Bose-Einstein statistics.
11 March To 16 March	Application of B.E. Statistics to Plancks's radiation law, B.E. gas.
18 March To 23 March	Fermi-Dirac statistics, M.B. Law as limiting case of B.E. CLASS TEST OF UNIT 1
25 March To 30 March	Holi break Assignment and revision of unit 1
01 April To 06 April	Degeneracy and B.E. Condensation. F.D. Gas.
08 April To 13 April	Electron gas in metals and Zero point energy, Class test of unit 2 and unit 3.
15 April To 20 April	Specific heat of metals and its solution.



GOVT. COLLEGE FOR WOMEN, SONEPAT

NAME OF FACULTY:- Vikas Malik

SUBJECT:- Physics (Wave and Optics II)

ACADEMIC SESSION:- 2023-24

SEM: 4th

CLASS:- Bsc. II (Comp. Sci.)

Week & Dates	Topics/Chapters to be covered/Events
15 Jan To 20 Jan	Superposition of waves (physical idea), Fourier Analysis of complex waves.
22 Jan To 27 Jan	Application of Fourier analysis for the solution of triangular waves and rectangular waves
29 Jan To 03 Feb	Half and full wave rectifier outputs using Fourier analysis.
5 Feb To 10 Feb	Fourier transforms and its properties.
12 Feb To 17 Feb	Application of Fourier transform to following function. $f(x) = e^{-x^2/2}$ $f(x) = 1 \quad [x] < a$ $0 \quad [x] > a$
19 Feb To 24 Feb	Types and properties of matrices, Matrix method in paraxial optics.
26 Feb To 02 March	Effect of translation and translation matrix, Effect of refraction and refraction matrix, System matrix, Position of the image plane and magnification by a spherical refracting surface.
04 March To 09 March	Position of image plane and magnification of the optical system, Derivation of thin lens and thick lens formulae, Unit plane
11 March To 16 March	Nodal planes, System of thin lenses, Chromatic, Spherical coma. Assignment 1.
18 March To 23 March	Astigmatism and distortion aberrations and their remedies.
25 March To 30 March	Holi Break
01 April To 06 April	Polarisation, Double refraction, Nicol Prism, production and detection of polarized light.
08 April To 13 April	Fiber optics, Assignment 2, class test 3
15 April To 20 April	Revision and problem discussion.

