

KVA DAV College for Women, Karnal

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher –Ms. Meenu Sharma

Subject- Properties of Matter and Kinetic Theory of Gases

Paper- PH-201

Class- B.Sc.-First Year (2nd Semester)

April, 2022 2 nd Week 4 April -9 April	Unit 1: Moment of inertia Rotation of rigid body, Moment of inertial, Torque, angular momentum, Kinetic Energy of rotation. Theorem of perpendicular and parallel axes (with proof), Moment of inertia of solid sphere
10 April, 2022	Sunday
3 rd Week 11 April-16 April	Hollow sphere, spherical shell, solid cylinder, hollow cylinder and solid bar of rectangular cross-section, Fly wheel, Moment of inertia of an irregular body, Acceleration of a body rolling down on an inclined plane.
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18 April-23 April	Unit 2: Elasticity Elasticity, Stress and Strain, Hook's law, Elastic constant and their relations, Poisson's ratio, Torsion of cylinder
24 April, 2022	Sunday
5 th Week 25 April - 30 April	twisting couple, Determination of coefficient of modulus of rigidity for the material of wire by Maxwell's needle, Bending of beam (Bending moment and its magnitude)
1 May, 2022	Sunday
May 2022 1 st Week 2 May -7 May	Cantilever and Centrally loaded beam, Determination of Young's modulus for the material of the beam and Elastic constants for the material of the wire by Searle's method. Class test
3 May , 2022 8 May , 2022	Eid-ul-Fitr Sunday
2 nd Week 9 May -14 May	Unit 3: Kinetic theory of gases-I Assumption of Kinetic theory of gases, pressure of an ideal gas (with derivation), Kinetic interpretation of Temperature
15 May, 2022	Sunday
3 rd Week 16 May-21 May	Ideal Gas equation, Degree of freedom, Law of equipartition of energy and its application for specific heat of gases

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22 May, 2022	Sunday
May, 2022 4 th Week 23 May--28 May	Sessionals
29 May, 2022	Sunday
5 th Week 30 May -31 May	Real gases, Vander wall's equation, Brownian motion(Qualitative) Unit 4: Kinetic theory of gases-II Maxwell's distribution of speed and velocities (derivation required)
June 2022 1 st week 1 June - 4 June	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.
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 6 June –11 June	Revision

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Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – Ms. Shruti Jain

Subject- Semiconductor Devices

Paper- PH-202

Class- B.Sc.-First Year (2nd Semester)

April, 2022 2 nd Week 4April -9 April	Unit 1: Semiconductors Energy bands in solids, Intrinsic and extrinsic semiconductors, carrier mobility and electrical resistivity of semiconductors, Hall effect, p-n junction diode and their characteristics, Zener and Avalanche breakdown, Zener diode
10 April, 2022	Sunday
3 rd Week 11 April-16 April	Zener diode as a voltage regulator. Light emitting diodes (LED), Photoconduction in semiconductors, Photodiode, Solar Cell, p-n junction as a rectifier, half wave and full wave rectifiers (with derivation) filters (series inductor, shunt capacitance, L-section or choke, n and R.C. filter circuits).
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18 April-23 April	Unit 2: Transistors Junction transistors, Working of NPN and PNP transistors, Three configurations of transistor (C-B, C-E, C-C modes), Common base, common emitter and common collector characteristics of transistor
24April, 2022	Sunday
5 th Week 25 April - 30April	Constants of a transistor and their relation, Advantages and disadvantages of C-E configuration. D.C. load line .Transistor biasing; various methods of transistor biasing and stabilization.
1 May, 2022	Sunday
May 2022 1 st Week 2May -7 May	Unit 3: Transistor Amplifiers Amplifiers, Classification of amplifiers, common base and common emitter amplifiers,
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2 nd Week 9 May -14 May	coupling of amplifiers various methods of coupling, Resistance- Capacitance (RC) coupled amplifier (two stage, concept of band width, no derivation)
15 May, 2022	Sunday
3 rd Week 16 May-21 May	Feedback in amplifiers, advantages of negative feedback, emitter follower, distortion in amplifiers. Class Test

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Subject- Semiconductor Devices

Paper- PH-202

Class- B.Sc.-First Year (2nd Semester)

22 May, 2022	Sunday
May, 2022 4 th Week 23 May--28 May	Sessionals
29 May, 2022	Sunday
5 th Week 30 May -31 May	Unit 4: Oscillators Oscillators, Principle of oscillation, classification of oscillators, Condition for self sustained oscillation:
June 2022 1 st week 1 June - 4 June	Barkhausen criterion for oscillation, Tuned collector common emitter oscillator
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 6 June –11 June	Hartley oscillator, C.R.O. (Principle and Working). Revision

Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – Ms. Vandana

Subject- Statistical Physics

Paper- PH- 401

Class- B.Sc.-Second Year (4th Semester)

April, 2022 2 nd Week 4April -9 April	Unit –I: Statistical Physics I Microscopic and Macroscopic systems, events- mutually exclusive, dependent and independent. Probability, statistical probability, A- priori Probability and relation between them, probability theorems, some probability considerations, combinations possessing maximum probability, combination possessing minimum probability
10 April, 2022	Sunday
3 rd Week 11 April-16 April	Tossing of 2,3 and any number of Coins, Permutations and combinations, distributions of N (for N= 2,3,4) distinguishable and indistinguishable particles in two boxes of equal size, Micro and Macro states, Thermodynamical probability, Constraints and Accessible states
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18 April-23 April	Statistical fluctuations, general distribution of distinguishable particles in compartments of different sizes, Condition of equilibrium between two systems in thermal contact-- β parameter, Entropy and Probability (Boltzman's relation).
24April, 2022	Sunday
5 th Week 25 April - 30April	Unit –II: Statistical Physics II Postulates of statistical physics, Phase space, Division of Phase space into cells, three kinds of statistics, basic approach in three statistics. M. B. statistics applied to an ideal gas in equilibrium
1 May, 2022	Sunday
May 2022 1 st Week 2May -7 May	energy distribution law (including evaluation of σ and β) , speed distribution law & velocity distribution law, Expression for average speed, r.m.s. speed, average velocity, r. m. s. velocity, most probable energy & mean energy for Maxwellian distribution.
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2 nd Week 9 May -14 May	Unit-III: Quantum Statistics Need for Quantum Statistics: Bose-Einstein energy distribution law, Application of B.E. statistics to Planck's radiation law B.E. gas, Degeneracy and B.E. Condensation, FermiDirac energy distribution law, F.D. gas and Degeneracy
15 May, 2022	Sunday
3 rd Week 16 May-21 May	Fermi energy and Fermi temperature, Fermi Dirac energy distribution law, Fermi Dirac gas and degeneracy, Fermi energy and Fermi temperature, Fermi Dirac energy distribution law for electron gas in metals, Zero point energy

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22 May, 2022	Sunday
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29 May, 2022	Sunday
5 th Week 30 May -31 May	Zero point pressure and average speed (at 0 K) of electron gas, Specific heat anomaly of metals and its solution. M.B. distribution as a limiting case of B.E. and F.D. distributions, Comparison of three statistics.
June 2022 1 st week 1 June - 4 June	Unit-IV: Theory of Specific Heat of Solids Dulong and Petit law. Derivation of Dulong and Petit law from classical physics. Specific heat at low temperature, Einstein theory of specific heat Class Test
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 6 June –11 June	Criticism of Einstein theory, Debye model of specific heat of solids, success and shortcomings of Debye theory, comparison of Einstein and Debye theories. Revision

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Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – Ms. Meenu Sharma

Subject- Wave and Optics II

Paper- PH-402

Class- B.Sc.-Second Year (4th Semester)

April, 2022 2 nd Week 4April -9 April	Unit-1: Polarization Polarization: Polarisation by reflection, refraction and scattering, Malus Law, Phenomenon of double refraction, Huygen's wave theory of double refraction (Normal and oblique incidence), Analysis of polarized Light
10 April, 2022	Sunday
3 rd Week 11 April-16 April	Nicol prism, Quarter wave plate and half wave plate, production and detection of (i) Plane polarized light (ii) Circularly polarized light and (iii) Elliptically polarized light
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18 April-23 April	Optical activity, Fresnel's theory of optical rotation, Specific rotation, Polarimeters (half shade and Biquartz).
24April, 2022	Sunday
5 th Week 25 April - 30April	Unit-II: Fourier analysis Fourier theorem and Fourier series, evaluation of Fourier coefficient, importance and limitations of Fourier theorem, even and odd functions
1 May, 2022	Sunday
May 2022 1 st Week 2May -7 May	Fourier series of functions $f(x)$ between (i) 0 to 2π , (ii) $-\pi$ to π , (iii) 0 to π , (iv) $-L$ to L , complex form of Fourier series, Application of Fourier theorem for analysis of complex waves ,Solution of triangular and rectangular waves , half and full wave rectifier outputs, Parseval identity for Fourier Series, Fourier integrals.
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2 nd Week 9 May -14 May	Unit III: Fourier transforms Fourier transforms and its properties, Application of Fourier transform (i) for evaluation of integrals, (ii) for solution of ordinary differential equations, (iii) to the following functions: 1. $f(x)= e^{-x^2/2} 1 X a$
15 May, 2022	Sunday
3 rd Week 16 May-21 May	Geometrical Optics I Matrix methods in paraxial optics, effects of translation and refraction, derivation of thin lens and thick lens formulae, unit plane, nodal planes, system of thin lenses.

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Paper- PH-402

Class- B.Sc.-Second Year (4th Semester)

22 May, 2022	Sunday
May, 2022 4 th Week 23 May--28 May	Sessionals
29 May, 2022	Sunday
5 th Week 30 May -31 May	Unit-IV: Geometrical Optics II Chromatic, spherical, coma, astigmatism and distortion aberrations and their remedies. Class Test
June 2022 1 st week 1 June - 4 June	Fiber Optics Optical fiber, Critical angle of propagation, Mode of Propagation, Acceptance angle, Fractional refractive index change
2 June, 2022 5 June, 2022	Maharana Pratap Jayanti Sunday
2 nd Week 6 June –11 June	Numerical aperture, Types of optics fiber, Normalized frequency, Pulse dispersion, Attenuation, Applications Fiber optic Communication, Advantages. Revision

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Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher –Ms. Shruti Jain

Subject- Solid State and Nano Physics

Paper- PH- 601

Class- Third Year (6th Semester)

April, 2022 2 nd Week 4April -9 April	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
10 April, 2022	Sunday
3 rd Week 11 April-16 April	Winger Seitz primitive Cell, symmetry operations for a two dimensional crystal, Bravais lattices in two and three dimensions.
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18 April-23 April	Crystal planes and Miller indices, Interplaner spacing, Crystal structures of Zinc Sulphide, Sodium Chloride and Diamond.
24April, 2022	Sunday
5 th Week 25 April - 30April	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
1 May, 2022	Sunday
May 2022 1 st Week 2May -7 May	reciprocal lattice vectors, reciprocal lattice to a simple cubic lattice, b.c.c. and f.c.c.
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2 nd Week 9 May -14 May	Unit III: Super conductivity Historical introduction, Survey of superconductivity, Super conducting systems, High Tc Super conductors, Isotopic Effect, Critical Magnetic Field
15 May, 2022	Sunday
3 rd Week 16 May-21 May	Meissner Effect, London Theory and Pippards' equation, Classification of Superconductors (type I and Type II), BCS Theory of Superconductivity

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Name of the Teacher –Ms. Shruti Jain

Subject- Solid State and Nano Physics

Paper- PH- 601

Class- Third Year (6th Semester)

22 May, 2022	Sunday
May, 2022 4 th Week 23 May--28 May	Sessionals
29 May, 2022	Sunday
5 th Week 30 May -31 May	Flux quantization, Josephson Effect (AC and DC), Practical Applications of superconductivity and their limitations, power application of superconductors.
June 2022 1 st week 1 June - 4 June	Unit IV: Introduction to Nano Physics Definition, Length scale, Importance of Nano-scale and technology, History of Nantechonology, Benefits and challenges in molecular manufacturing. Molecular assembler concept,
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 6 June –11 June	Understanding advanced capabilities. Vision and objective of Nano-technology, Nanotechnology in different field, Automobile, Electronics, Nano-biotechnology, Materials, Medicine. Revision And Class Test

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Lesson plan for the Even semester (April, 2022 to June, 2022)

Name of the Teacher – Ms. Vandana

Subject- Atomic and Molecular Spectroscopy

Paper- PH-602

Class- B.Sc.-Third Year (6thSemester)

April, 2022 2 nd Week 4April -9 April	Unit – I: Historical background of atomic spectroscopy Introduction of early observations, emission and absorption spectra, atomic spectra, wave number, spectrum of Hydrogen atom in Balmer series, Bohr atomic model(Bohr's postulates) ,
10 April, 2022	Sunday
3 rd Week 11 April-16 April	spectra of Hydrogen atom , explanation of spectral series in Hydrogen atom, un-quantized states and continuous spectra, 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
14 April, 2022 17 April, 2022	Vaisakhi Sunday
4 th Week 18 April-23 April	short comings 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, Sommerfeld relativistic correction, Short comings of Bohr-Sommerfeld theory
24April, 2022	Sunday
5 th Week 25 April - 30April	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.
1 May, 2022	Sunday
May 2022 1 st Week 2May -7 May	Unit –II: Vector Atom Model (single valance electron) Orbital magnetic dipole moment (Bohr megnaton), behavior of magnetic dipole in external magnetic field; Larmors' precession and theorem. Penetrating and Non-penetrating orbits, Penetrating orbits on the classical model; Quantum defect Class Test
3 May , 2022 8May , 2022	Eid-ul-Fitr Sunday
2 nd Week 9 May -14 May	spin orbit interaction energy of the single valance electron, spin orbit interaction for penetrating and non-penetrating orbits. quantum mechanical relativity correction, Hydrogen fine spectra, Main features of Alkali Spectra and their theoretical interpretation ,term series and limits, Rydeburg-Ritze combination principle
15 May, 2022	Sunday
3 rd Week 16 May-21 May	Absorption spectra of Alkali atoms. observed doublet fine structure in the spectra of alkali metals and its Interpretation, Intensity rules for doublets, comparison of Alkali spectra and Hydrogen spectrum . 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

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22 May, 2022	Sunday
May, 2022 4 th Week 23 May--28 May	Sessionals
29 May, 2022	Sunday
5 th Week 30 May -31 May	periodic classification of the elements. 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.
June 2022 1 st week 1 June - 4 June	Unit –IV: Atom in External Field Zeeman Effect (normal and Anomalous),Experimental set-up for studying Zeeman effect, 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.
2 June, 2022 5 June, 2022	MaharanaPratapJayanti Sunday
2 nd Week 6 June –11 June	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. Revision