Lesson Plan for the Even Semester, 2024 (January - April)

January, 2024 1 st Week	Unit –I: Statistical Physics I Microscopic and Macroscopic systems, events- mutually exclusive, dependent and independent
1 Jan - 6 Jan	
7 Jan, 2024	Sunday
2 nd Week	Probability, statistical probability, A- priori Probability and relation between
8 Jan - 13 Jan	them, probability theorems, some probability considerations, combinations
	possessing maximum probability, combination possessing minimum probability
14 Jan, 2024	Sunday
3 rd Week	Tossing of 2,3 and any number of Coins, Permutations and combinations,
15 Jan – 20 Jan	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.
17 Jan,2024	Shri Guru Gobind Singh Javanti
21 Jan, 2024	Sunday
4 th Week	Statistical fluctuations, general distribution of distinguishable particles in
22 Jan - 27 Jan	compartments of different sizes
26 Ian 2024	Republic Day
28 Jan. 2024	Sunday
5 th Week	Condition of equilibrium between two systems in thermal contact B
29 Jan – 31 Jan	parameter, Entropy and Probability (Boltzman's relation).

Lesson Plan for the Even Semester, 2024

(January - April)

4 Feb, 2024	Sunday
2 nd Week	Unit –II: Statistical Physics II Postulates of statistical physics, Phase space,
5 Feb - 10 Feb	Division of Phase space into cells
11 Feb, 2024	Sunday
3 rd Week	Three kinds of statistics, basic approach in three statistics. M. B. statistics
12 Feb-17 Feb	applied to an ideal gas in equilibrium
14 5.1. 2024	
14 Feb, 2024 18 Feb, 2024	Basant Panchmi
A th Week	Sunday $($ anorgy distribution law (including avaluation of α and β), speed distribution
4 WEEK 19 Feb - 24 Feb	law & velocity distribution law
17 100 - 24 100	
25 Feb, 2024	Sunday
5 th Week	Expression for average speed, r.m.s. speed, average velocity, r.m.s. velocity,
26 Feb - 29 Feb	most probable energy & mean energy for Maxwellian distribution.

Lesson Plan for the Even Semester, 2024

(January - April)

3 March, 2024	Sunday
2 nd Week	Unit-III: Quantum Statistics Need for Quantum Statistics: Bose-Einstein
4 March - 9 March	energy distribution law, Application of B.E. statistics to Planck's radiation law
8 March ,2024	Maha Shivratri
10 March, 2024	Sunday
3 ^{ra} Week	B.E. gas Degeneracy and B.E. Condensation, FermiDirac energy distribution
11 March - 16 March	law, F.D. gas and Degeneracy
17 March, 2024	Sunday
4 th Week	Fermi energy and Fermi temperature, Fermi Dirac energy distribution law,
18 March – 22 March	Fermi Dirac gas and degeneracy, Fermi energy and Fermi temperature.
	Fermi Dirac energy distribution law for electron gas in metals, Zero point energy
23 March- 31 March	Holi Break

Lesson Plan for the Even Semester, 2024

(January - April)

April, 2024 1 st Week 1 April- 6 April	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.
7 April ,2024	Sunday
2 nd Week	Sessional Exams
8 April – 13 April	
11 April, 2024	Id-Ul-Fitr
14 April, 2024	Sunday
3 rd Week	Unit-IV: Theory of Specific Heat of Solids Dulong and Petit law. Derivation of
15 April - 20 April	Dulong and Petit law from classical physics. Specific heat at low temperature,
	Einstein theory of specific heat
	Class Test
17 April, 2024	Ram Navmi
21 April, 2024	Sunday
4 Week 22 April - 27 April	criticism of Einstein theory, Debye model of specific heat of solids, success and
	shortcomings of Debye theory, comparison of Einstein and Debye theories.
	Revision
University Examination:-1 May, 2024 Onwards	

Lesson Plan for the Even Semester, 2024

(January - April)

January, 2024 1 st Week 1 Jan - 6 Jan	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
7 Jan, 2024	Sunday
2 nd Week	Bohr atomic model(Bohr's postulates), spectra of Hydrogen atom, explanation
8 Jan - 13 Jan	of spectral series in Hydrogen atom
14 Jan, 2024	Sunday
3 rd Week	un-quantized states and continuous spectra, spectral series in absorption
15 Jan – 20 Jan	spectra, effect of nuclear motion on line spectra (correction of finite nuclear
	mass), variation in Rydberg constant due to finite mass
17 Jan,2024	Shri Guru Gobind Singh Jayanti
21 Jan, 2024	Sunday
4 th Week 22 Jan - 27 Jan	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
26 Jan. 2024	Republic Day
28 Jan, 2024	Sunday
5 th Week 29 Jan – 31 Jan	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.

Lesson Plan for the Even Semester, 2024

(January - April)

4 Feb, 2024	Sunday
2 nd Week 5 Feb - 10 Feb	Unit –II: Vector Atom Model (single valance electron) Orbital magnetic dipole moment (Bohr megnaton), behavior of magnetic dipole in external magnetic field
11 Feb, 2024	Sunday
3 rd Week 12 Feb-17 Feb	Larmors' precession and theorem. Penetrating and Non-penetrating orbits, Penetrating orbits on the classical model; Quantum defect ,spin orbit interaction energy of the single valance electron, spin orbit interaction for penetrating and non-penetrating orbits.
14 Feb, 2024 18 Feb, 2024	Basant Panchmi Sunday
4 th Week 19 Feb - 24 Feb	quantum mechanical relativity correction, Hydrogen fine spectra, Main features of Alkali Spectra and their theoretical interpretation ,term series and limits, Rydeburg-Ritze combination principle
25 Feb, 2024	Sunday
5" Week 26 Feb - 29 Feb	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 .

Lesson Plan for the Even Semester, 2024

(January - April)

3 March, 2024	Sunday
2 nd Week	UNIT-III: Vector Atom model (two valance electrons) Essential features of
4 March - 9 March	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
8 March 2024	Maha Shivratri
10 March, 2024	Sunday
3 rd Week	periodic classification of the elements. Interaction energy in JJ Coupling (sp.
11 March - 16 March	pd configuration), equivalent and non-equivalent electrons, Two valance
	electron system-spectral terms of non-equivalent and equivalent electrons.
15 16 1 2024	
17 March, 2024	Sunday
4 th Week	comparison of spectral terms in L-S And J-J coupling. Hyperfine structure of
18 March – 22 March	spectral lines and its origin; isotope effect, nuclear spin.
23 March- 31 March	Holi Break

Lesson Plan for the Even Semester, 2024

(January - April)

April, 2024 1 st Week 1 April- 6 April	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)
7 April ,2024	Sunday
2 ^{aa} Week 8 April – 13 April	Sessional Exams
11 April, 2024 14 April, 2024	Id-Ul-Fitr Sunday
3 rd Week 15 April - 20 April	Zeeman pattern of D1 and D2 lines of Naatom, Paschen-Back effect of a single valence electron system. Weak field Stark effect of Hydrogen atom. Molecular Physics: General Considerations, Electronic States of Diatomic Molecules
17 April, 2024 21 April, 2024	Ram Navmi Sunday
4 th Week 22April - 27 April	Rotational Spectra (Far IR and Microwave Region),Vibrational Spectra (IR Region), Rotator Model of Diatomic Molecule, Raman Effect, Electronic Spectra.
5 th Week 29 April - 30 April	Revision and Class test
University Examination:-1 May, 2024 Onwards	

Lesson Plan for the Even Semester, 2024

(January - April)

Name of the Teacher – Dr. Richa Khokhra Class- B.Sc.-Second Year (4th Semester) Subject- Wave and Optics II Paper- PH-402

T 2024	
January, 2024	Unit-1: Polarization
1 st Week	
1 Jan - 6 Jan	Polarization (Introduction)
1 Jun O Jun	
7 Jan, 2024	Sunday
2 nd Week	Polarisation by reflection, refraction and scattering, Malus Law, Phenomenon of
8 Ion - 13 Ion	double refraction
0 Jan - 13 Jan	
14 Jan 2024	Cundou
14 Jan, 2024	Sunday
3 rd Week	Huygen's wave theory of double refraction (Normal and oblique incidence),
15 Jan – 20 Jan	Analysis of polarized Light
17 Jan,2024	Shri Guru Gobind Singh Jayanti
21 Jan. 2024	Sunday
Ath West	Nicel union. Overten were alste and helf were alste. Due dwetien and detection
4 week	Nicol prism, Quarter wave plate and half wave plate, Production and detection
22 Jan - 27 Jan	of (i) Plane polarized light (ii) Circularly polarized light and (iii) Elliptically
	polarized light,
26 Jan. 2024	Republic Day
28 Jan, 2024	Sunday
5 th Week	Ontical activity. Fresnel's theory of ontical rotation
20 Ion 21 Ion	
29 Jan – 31 Jan	

Lesson Plan for the Even Semester, 2024

(January - April)

Name of the Teacher – Dr. Richa Khokhra Class- B.Sc.-Second Year (4th Semester) Subject- Wave and Optics II Paper- PH-402

4 Feb, 2024	Sunday
2 nd Week	Specific rotation, Polarimeters (half shade and Biquartz).
5 Feb - 10 Feb	Unit-II: Fourier analysis (Introduction): Fourier theorem and Fourier series,
11 Feb, 2024	Sunday
3 rd Week 12 Feb-17 Feb	evaluation of Fourier coefficient, importance and limitations of Fourier theorem, even and odd functions
14 Feb, 2024	Basant Panchmi
18 Feb, 2024	Sunday
4 th Week	Fourier series of functions f(x) between (i) 0 to 2pi, (ii) –pi to pi, (iii) 0 to pi, (iv) –
19 Feb - 24 Feb	L to L, complex form of Fourier series, Application of Fourier theorem for analysis of complex waves ,
25 Feb, 2024	Sunday
5 th Week	Solution of triangular and rectangular waves, half and full wave rectifier outputs,
26 Feb - 29 Feb	Parseval identity for Fourier Series, Fourier integrals.
	Some examples

Lesson Plan for the Even Semester, 2024

(January - April)

Name of the Teacher – Dr. Richa Khokhra Class- B.Sc.-Second Year (4th Semester) Subject- Wave and Optics II

Paper- PH-402

3 March, 2024	Sunday
2 nd Week	Unit III: Fourier transforms
4 March - 9 March	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- x2/ 2 1 X a Some examples
8 March ,2024	Maha Shivratri
10 March, 2024	Sunday
3 rd Week	Geometrical Optics I:
11 March - 16 March	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. Class Test
17 March, 2024	Sunday
4 th Week	Unit-IV: Geometrical Optics II
18 March – 22 March	Chromatic, spherical, coma,
23 March- 31 March	Holi Break

Lesson Plan for the Even Semester, 2024 (January - April)

Name of the Teacher – Dr. Richa Khokhra Class- B.Sc.-Second Year (4th Semester) Subject- Wave and Optics II Paper- PH-402

April, 2024	astigmatism and distortion aberrations and their remedies.
1 ⁵⁷ Week 1 April- 6 April	Class Test
7 April ,2024	Sunday
2 nd Week 8 April – 13 April	Sessional Exams
11 April, 2024 14 April, 2024	Id-Ul-Fitr Sunday
3 rd Week 15 April - 20 April	Fiber Optics: Optical fiber, Critical angle of propagation, Mode of Propagation, Acceptance angle, Fractional refractive index change
17 April, 2024 21 April, 2024	Ram Navmi Sunday
4 th Week 22April - 27 April	Numerical aperture, Types of optics fiber, Normalized frequency, Pulse dispersion, Attenuation, Applications
5 th Week 29 April - 30 April	Fiber optic Communication, Advantages. Revision
University Examination:-1 May, 2024 Onwards	

Lesson Plan for the Even Semester, 2024

(January - April)

Name of the Teacher – Dr. Richa Khokhra Class- B.Sc.-Third Year (6th Semester) Subject- Solid State and Nano Physics Paper- PH-601

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January, 2024	Unit I: Crystal Structure I Crystalline and glassy forms, liquid crystals,
1 st Week	crystal structure, periodicity, lattice and basis, crystal translational vectors
1 Jan - 6 Jan	and axes.
7 Jan, 2024	Sunday
2 nd Week	Unit cell and Primitive Cell, Winger Seitz primitive Cell, symmetry
8 Jan - 13 Jan	operations for a two dimensional crystal
14 Jan, 2024	Sunday
3 rd Week	Bravais lattices in two and three dimensions.
15 Jan – 20 Jan	
17 Jan,2024	Shri Guru Gobind Singh Jayanti
21 Jan, 2024	Sunday
4 th Week	
22 Jan - 27 Jan	Crystal planes and Miller indices, Interplaner spacing,
	Some Examples
	•
26 Jan. 2024	Republic Day
28 Jan, 2024	Sunday
5 th Week	Crystal structures of Zinc Sulphide, Sodium Chloride and Diamond
29 Jan – 31 Jan	

Lesson Plan for the Even Semester, 2024

(January - April)

Name of the Teacher – Dr. Richa Khokhra **Class- B.Sc.-Third Year (6th Semester)** Subject- Solid State and Nano Physics

Paper- PH-601

February, 2024 1 st Week 1 Feb – 3 Feb	Unit II: Crystal Structure II X-ray diffraction, Bragg's Law and experimental X-ray diffraction methods
4 Feb, 2024	Sunday
2 nd Week	K-space and reciprocal lattice and its physical significance Reciprocal
5 Feb - 10 Feb	lattice vectors,
11 Feb, 2024	Sunday
3 rd Week	Reciprocal lattice to a simple cubic lattice, B.C.C and F.C.C.
12 Feb-17 Feb	
	Class Test
14 Feb, 2024	Basant Panchmi
18 Feb, 2024	Sunday
4 th Week	Unit III: Super conductivity (Introduction) Historical introduction,
19 Feb - 24 Feb	Survey of superconductivity, Super conducting systems, High Tc Super
	conductors
25 Feb, 2024	Sunday
5 th Week	
26 Feb - 29 Feb	Isotopic Effect, Critical Magnetic Field, Meissner Effect, London Theory
	and

Lesson Plan for the Even Semester, 2024

(January - April)

Name of the Teacher – Dr. Richa Khokhra Class- B.Sc.-Third Year (6th Semester) Subject- Solid State and Nano Physics Paper- PH-601

A	
3 March, 2024	Sunday
2 nd Week	Pippards' equation, Classification of Superconductors (type I and Type
4 March - 9 March	II), Flux quantization
8 March ,2024	Maha Shivratri
10 March, 2024	Sunday
3 rd Week	BCS Theory of Superconductivity, Josephson Effect (AC and DC),
11 March - 16 March	Practical Applications of superconductivity and their limitations,
17 March, 2024	Sunday
4 th Week	Power application of superconductors.
18 March – 22 March	Unit IV: Introduction to Nano Physics Definition, Length scale,
	Class Test
23 March- 31 March	Holi Break

Lesson Plan for the Even Semester, 2024

(January - April)

Name of the Teacher – Dr. Richa Khokhra Class- B.Sc.-Third Year (6th Semester) Subject- Solid State and Nano Physics Paper- PH-601

April, 2024 1 st Week 1 April- 6 April	Importance of Nano-scale and technology, History of Nanotechnology Benefits and challenges in molecular manufacturing. Molecular assembler concept,	
7 April ,2024	Sunday	
2 nd Week	Sessional Exams	
8 April – 13 April		
11 April, 2024	Id-Ul-Fitr	
14 April, 2024	Sunday	
3 rd Week		
15 April - 20 April	Understanding advanced capabilities. Vision and objective of Nano- technology, Nanotechnology in different field, Automobile, Electronics, Nano-biotechnology, Materials, Medicine.	
17 April, 2024	Ram Navmi	
21 April, 2024	Sunday	
4 th Week 22April - 27 April	Revision	
University Examination:-1 May, 2024 Onwards		