Dr. Parul Jain Lesson Plan:

TEACHING PLAN 2023-24 (ODD SEMESTER)

(July 2023 to Nov 2024)

NAME : PARUL JAIN
        DEPARTMENT : PHYSICS

SUBJECT : Physics [B.Sc. Chem (H) 1st Semester]

MONTH	1st WEEk	2nd WEEK	3rd WEEK	4th WEEK
JULY				DoF, Gen Coord., Hamilton's Principle
AUGUST	Conservation laws , Centre of mass and Eq. of motion	Mechanics of single particle and system of particles **Test 1**	Lagrange's EoM, LHO, Simple Pendulum	Elasticity and Elastic constants , Poisson's ratio
SEPTEMBER	Bending of Beam, Centrally loaded beam **Assignment**	Newtonian relativity principle **Test 2**	Lorentz transformations Variation of mass with velocity	Derivation of E from V as grad, laplace and Poisson eq.
OCTOBER	Electric flux, Gauss law and its applications **Assignment**	Mechanical force of charged Surface **Test 3**	Magnetic Induction, Magnetic flux, Properties of B	Solenoidal nature of vector field Ferromagnetism and Hysteresis curve

NOVEMBER	Maxwell Equations and their Derivations **Final Test**			

TEACHING PLAN 2023-24 (EVEN SEMESTER)

(JAN 2023 to APRIL 2024)

Name :-   Parul Jain   Department:-   Physics
Class:- BSc Hons Chemistry   Sub:-

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
JANUARY			Semiconductor Diodes Energy bands in solids. Intrinsic and extrinsic semiconductor, Hall effect, P-N junction diode and their V-I characteristics.	Zener and avalanche breakdown. Resistance of a diode, Light Emitting diodes (LED). Photo conduction in semiconductors, photodiodes, Solar Cell.	Diode Rectifiers P-N junction half wave and full wave rectifier. Types of filter circuits. Zener diode as voltage regulator, simple regulated power supply.
FEBRUARY	Junction Transistors, Bipolar transistors, working of NPN and PNP transistors, Transistor connections (C-B, C-E,	Advantage of C-B configuration. C.R. O. Numericals and Text book	Methods of Transistor biasing and stabilization. D.C. load line. Common-base and common-emitter transistor biasing.	Feed-back in amplifers, advantage of negative feedback Emitter follower.	Oscillators, Principle of Oscillation, Classification of Oscillator. Condition for self sustained oscillation ;

	C-C mode), constants of transistor. Transistor characteristic curves	question practice.	Common-base , common-emitteer amplifers. Classification of amplifers. (R-C) coupled amplifier		Hartley oscillator.
MARCH	Test and assignments. Main features of a laser : Directionality, high intensity, high degree of coherence, spatial and temporal coherence.	Einstein's coefficients and possibility of amplification, momentum transfer,lifetime of a level.	Kinetics of optical absorption. Threshold condition for laser emission, Laser pumping		
APRIL	He-Ne laser and RUBY laser (Principle, Construction and Working)	Applications of lasers in the field of medicine and industry.	Text book questions and assignments.	Revision.	

Teacher Signature

TEACHING PLAN 2023-24 (ODD SEMESTER)

(Jan 2024 to April 2024)

NAME : PARUL JAIN

DEPARTMENT : PHYSICS

SUBJECT : Quantum [M.Sc 2nd Semester]

MONTH	1st WEEK	2nd WEEK	3rd WEEK	4th WEEK

January			**Unit 1 :** Variational Methods, ground state of helium by both variational method and perturbation methods	The hydrogen molecule, WKB approximation, time dependent perturbation theory.
February	Constant perturbation, harmonic perturbation, Fermi golden rule, Adiabatic and sudden approximation. **Test 1** **Assignment1**	**Unit 2:** Semiclassical theory of radiation, transition probability for absorption to and induced emission, electric dipole transition and selection rules,	magnetic dipole transitions, forbidden transitions, higher order transitions, Einstein coefficients **Test 2** **Assignment 2**	**Unit 3:** Collision in 3d and scattering, Laboratory and C.M. reference frames, scattering amplitude, differential scattering cross-section and total scattering cross-section
March	The optical theorem, scattering by spherically symmetric potentials. Partial waves and phase shifts,	scattering by perfectly rigid sphere and by square well potential, complex potential and absorption, the Bon approximation	**Test 3** **Assignment 3** **Unit 4** Identical particles, the principle of indistinguishability	**Holi Break**

April	Symmetric and antisymmetric wave functions, spin and statistics of identical particles, the slater determinant, the pauli exclusion principle,	Spin state of 2 electron system, states of helium atom, collision of identical particles **Test 4** **Revision**	**Revision Test**	

TEACHING PLAN 2023-24 (ODD SEMESTER)

(August 2023 to NOV 2024)

NAME : PARUL JAIN

DEPARTMENT : PHYSICS

SUBJECT : Quantum [M.Sc 1st Semester]

MONTH	1st WEEK	2nd WEEK	3rd WEEK	4th WEEK
August				**Unit 1 :** State and Operators; Representation of States and dynamical variables, linear vector space; Bra Ket notation, Linear Operators; orthogonal set of vectors, Completeness relation;

Septe mber	Hermitian operators; Commutation rule Uncertainty relation; simultaneous eigenstate of commuting operators, The unitary transformation; Dirac Delta Function, Relation between Kets and wave function	Matrix representation of operators; solution of linear harmonic oscillator problem by operator methods **Test 1** **Assignment 1**	**Unit 2:** Angular momentum operators and their representation in spherical polar coordinates; eigen values and eigenvector of L^2, spherical harmonics; commutation relations among LX, LY, LZ; Rotational symmetry	Conservation of angular momentum; Eigenvalues of J^2 and J^Z and their matrix representation; Pauli spin matrices; Addition of angular momentum
Octobe r	**Test 2** **Assignment 2** **Unit 3:** The three dimensional harmonic oscillator in both cartesian and spherical polar coordinates	eigenvalues eigenfunctions and the degeneracy of states; solution of the hydrogen atom problem, the eigenvalues eigenfunctions and the degeneracy	**Test 3** **Assignment 3** **Unit 4:** Time independent perturbation theory; non degenerate case	**Diwali Break**
Novem ber	The energies and wave functions in first order the energy in second order, anharmonic perturbations of the form λX3 and λX4; degenerate perturbation theory	stark effect of the first excited state of hydrogen. **Test 4** **Revision**	**Revision Test**	

TEACHING PLAN 2023-24 (EVEN SEMESTER)

(January 2024 to April 2024)

NAME: Dr. Neetu Sorot   DEPARTMENT: PHYSICS

SUBJECT: Atomic and Molecular Physics (M.Sc. 2nd Semester)

MONTH	1st WEEK	2nd WEEK	3rd WEEK	4th WEEK
January		Quantum States, Pauli's Principle, Atomic Orbitals, one electron system	Alkali elements, alkali spectra, equivalent and non-equivalent electrons	Spin orbit interaction, spectra of two electron system
February	Fine and hyperfine structure	Zeeman effect Doubt class	Paschen Back effect and Stark effect Class test 1	LS and JJ coupling
March	Diatomic molecules and rotational spectra	Rigid Rotator and non- rigid rotator	Types of molecules, intensity of rotational lines Class test 2	Holi Break
April	Vibrational spectra and energy of diatomic molecules	Harmonic Oscillator and Morse potential curve	Molecules as vibrating rotator and PQR branches	Doubt class

Lesson Plan (Even Semester 2023-24 Session)

Teacher Name: Dr. Davinder Singh   Class: M.Sc (First Year)

Semester: Second

Month Name	First Week	Second Week	Third Week	Fourth Week	Fifth Week
January				Introduction to Solid State Physics, Basis Lattice, Direct Lattice, Translational Vectors, Two and Three dimensional Bravais Lattice	Conventional Unit cells of FCC, BCC, NaCl, CsCl, Diamond and Cubic ZnS
February	Primitive unit cells of FCC, BCC and HCP, Diamond structures, Interaction of X rays with matter, Absorption of Gamma rays by matter.	Elastic scattering from a perfect lattice, Reciprocal lattice and its applications, Ewald construction	XRD methods: Laue pattern method, Rotating Crystal method, Powder method, Crystal structure factor, Form Factor, Test.	Crystal facor of BCC, FCC, Monatomic diamond lattice, polyatomic CuZn, Lattice Vibrations: Variation of Monoatomic and diatomic chains	Density of normal modes in one and three dimensions, Quantization of lattice vibrations, Measurement of Phonon dispersion, Defects present in the crystal
March	Observation of imperfection in crystal, X-ray and electron	Electron in periodic lattice, Bloch theorem, Kroning Penny method and Molecular field theory, Theory of	Spin waves and Magnon dispersion, Domains and Bloch wall energy,	Classifications of Solids, effective mass, weak binding method and its applications,	Applications of Tight binding method to simple cubic, BCC, and FCC crystals, Assignment 1.

	microscopic techniques	Ferromagnetis m,	Ferrimagnetisms and ferrites	Tight binding method.	
April	Concept of Hole, Fermi Surfaces. Construction of Fermi Surfaces in 2D	D Hass Alfenas effect, Cyclotron Resonance, Magnetic Resonance, Assignment 2	Concept of Superconductivity, Occurrence of superconductivity, Meissner effect, Type 1 and Type 2 superconductors, Heat capacity	Energy gap, Isotopic effect, London equations, Coherence length, Postulates of BCS theory, Persistent current	High Temperature oxide and Superconductivity.

Test and Revision of the syllabus |

TEACHING PLAN 2021-2022 (EVEN SEMESTER)

(January 2021 to April 2021)

Name :- Dr. Neetu Sorot
Department: Physics

Subject:-Atomic and Molecular Physics
Section: B.Sc. 6th sem CS

Month	1st Week	2nd Week	3rd Week	4th Week
January		Vector atom model, Quantum numbers	Penetrating and non-penetrating orbits, Spin-orbit interaction	LS-coupling, Alkali spectra, jj-coupling

Doubt Class |

Month				
February	Zeeman effect (normal and anomalous)	Zeeman pattern of D1 and D2 lines of Na-atom	Paschen back effect and Stark effect	Raman effect, Stoke's and anti-stoke's lines **Class Test**
March	Electronic energies/Quantization of rotational and vibrational spectra	Introduction to LASER and its features **Doubt Class**	Einstein's coefficient and possibility of amplification	Threshold condition for Laser emission
April	Kinetics of optical absorption	Ruby Laser **Class Test**	He-Ne Laser	**Doubt Class**

Teacher's signature
HOD's signature

TEACHING PLAN 2023-2024(Even Semester)

(January 2023 to April 2024)

Name :- Jyoti Narwat

Department: Physics   Sub:- Optics 4th Sem.

Month	1st week	2nd week	3rd week	4th week	5th week
January			Colour of thin films, Wedge shaped film, Newton's ring,	Michelson's interferometer and its application: standardization of meter, Determination of wavelength	Fresnel's half period zone, Zone plate, Diffraction at a straight edge,
February	Rectangular slit and circular apperture	Revision, assignment and test, One slit diffraction, Two slit diffraction, N-slit diffraction	Plane transmission grating spectrum, Dispersive power a grating	Limit of resolution, Rayleigh's criterion, Resolving power of telescope and a grating	Revision, assignment and test
March	Polarization and double refraction, polarization by reflection	Polarization by scattering, Malus law, Phenomenon of double refraction	Huygen's wave theory of double refraction (Normal and oblique incidence),	Nicol prism, Quarter wave plate and half wave plate,	Production and detection of plane polarized light
April	circularly polarized light, Elliptically polarized light, optical activity,	Fresnel's theory of rotation, Specific rotation, Polarimeters	Revision, test and assignment	Revision	Revision

		(half shade and quartz)			

TEACHING PLAN 2023-2024(Even Semester)

(January 2024 to April 2024)

Name :- Jyoti Narwat
Department: Physics

Sub:- Electro Magnetic Induction & Electronic Devices 2nd Sem

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
January			Growth & Decay of Current in a CR Circuit, Growth & decay of current in a LR circuit	Growth & Decay of current in a LC circuit Growth & Decay of current in LCR circuit	Discussion
February	Alternating Current discussion AC circuit with R alone, L alone and C alone.	AC analysis with CR, RL & LC circuit. Numericals.	AC with LCR series and parallel circuit	Series and parallel resonant circuit. Quality factor. Assignment.	Revision & Test
March	Energy bands in solids. Intrinsic and extrinsic semiconductor. PN juction diode, and VI charactristics. Hall effect. Discussion	Zener diode, avalanche breakdown. Resistance of a diode. LED, photoconduction in semiconductors, photodiode, solar cell	PN junction half wave and full wave rectifier. Types of filters	Zener diode as voltage regulator, simple regulated powe supply. Transistors. Working of NPN & PNP transistors.	Transistor characteristics curve. CRO.

Month				
April	Transistor biasing & methods. DC load line. Classification of amplifiers. Assignment.Test	RC coupled amplifier, feed back amplifiers & advantages, feedback emitter follower.	Oscillator principle, tank circuit, classification, berkhausen condition. Hartley, Colpitt, Tuned Oscillator.	Revision	Revision

TEACHING PLAN 2023-2024 (ODD SEMESTER)

(August 2023 to November 2023)

Name : SHRUTI VERMA
Department: Physics

Sub:-B.Sc. Chem (Hons) Physics 3rd Sem

Month	1st Week	2nd Week	3rd Week	4th Week	
August	Introduction to New topics.	Interference by Division of Wavefront : Fresnel's Biprism and its applications to determination of wave length of sodium light	Thickness of a mica sheet, Lioyd's mirror, phase change on reflection.	Interference by Division of Amplitude :Colour of thin, films, wedge shaped film, Newton's rings. Interferometers	
September	Michelson's interferometer and its application to (I) Standardisation of a meter (II)	Fresnel's Diffraction : Fresnel's half period zones, zone plate, diffraction at a straight edge, rectangular slit	Fraunhoffer diffraction : One slit diffraction, Two slit diffraction, N transmission grating spectrum, Disperslit diffraction, Plane sive power of a grating	Limit of resolution, Rayleigh's criterion, resolving power of telescope and a	

	determination of wave length.	and circular apperture		grating.Polarisation and Double Refraction
October	Polarisation by reflection, Polarisation by scattering, Malus law, Phenomenon of double refra ction, Huytgen's wave theory of double refraction (Normal and oblique incidence),	Analysis of Palorised light : 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, Optical activity, Fresnel's theory of rotation, Specific rotation, Polarimeters (half shade and Biquartz).	Nuclear mass and binding ene rgy, systematics nuclear binding energy, nuclear stability, Nuclear size, spin, parity, statistics magnetic dipole moment, quadrupole moment (shape concept).
November	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 Introduction of light charged particle (Beta-- Nuttal law. particle), Origin of continuous beta (ne-- spectrum utrino hypothesis) types of beta decay and energetics of beta decay,	Energy loss of beta particles (ionization), Range of electrons, absorption of betaparticles. Interaction of Gamma Ray, Nature of gamma rays	Energetics of gamma rays, passage of Gamma ra diations through matter (photoelectric, compton and pair production effect) electron Positron anhilation. Asborption of Gamma rays (Mass attenuation coefficient) and its application.

TEACHING PLAN 2023-2024 (ODD SEMESTER)

(August 2023 to November 2023)

Name : SHRUTI VERMA
Department: Physics

Sub:-B.Sc. NM 5th Sem Section A (Quantum mechanics)

Month	1st Week	2nd Week	3rd Week	4th Week	
August	Failure of (Classical) E.M. Theory.	quantum theory of radiatio (old quantum theory), Photon, photoelectric effect	**Einsteins photoelectric equation compton effect (theory and result**	**Inadequancy of old quantum theory, de-Broglie hypothesis. Davisson and Germer experiment.**	
September	G.P. Thomson experiment. Phase velocity group velocity,	Heisenberg's uncertainty principle. Time-energy and angular momentum,	position uncertainty Uncertainty principle from de-Broglie wave, (wave-partice duality). Gamma Ray Maciroscope, Electron diffraction from a slit.	Derivation of time dependent Schrodinger wave equation, eigen values, eigen functions,	
October	wave functions and its significance. Normalization of wave function, concept of observable and	Solution of Schrodinger equation for harmomic oscillator ground states and excited states.	Application of Schrodinger equation in the solution of the following one-dimensional problems :	Free particle in one dimensional box (solution of schrodinger wave equation, eigen function,	
November	eigen values, quantization of energy and momentum, nodes and antinodes, zero point energy). i) One-dimensional potential barrie E>V0 (Reflection and Transmission coefficient.	One-dimensional potential barrier, E>V0 (Reflection Coefficient, penetration of leakage coefficient, penetration depth).	Revision	Revision	

TEACHING PLAN 2023-2024 (ODD SEMESTER)

(August 2023 to November 2023)

Name : SHRUTI VERMA

Department: Physics

Sub:-B.Sc. NM 5th Sem Section A (Solid State)

Month	1st Week	2nd Week	3rd Week	4th Week	
August	Crystalline and gallssy forms, liquid crystals.	lattice and basis, crystal translational vectors and axes.	Gauss divergence theorem Numerical and questions Test	Stoke's theorem Numerical practice Electrostatic field(derivative of E from potential gradient**)**	
September	Derivation of Laplace and poisson equation Nerical practice Test	Electric flux and Gauss law Application of Gauss law to spherical shell Uniformly charged infinite plane sheet	Uniformly charged straight wire Mechanical force of charged surface, energy per unit volume Numericals and textbook questions	Magnetostatic- magnetic induction, magnetic flux Solenoidal nature of vector field of induction Properties of B; divB=0	
October	Electronic theory of diamagnetic substances(langevin's theory) Electronic theory of paramagnetic substances Contd….	Domain theory of ferromagnetis m Cycle of magnetisation and hysteresis Contd….	Hysteresis law and importance of hysteresis curve Evaluation Test Evaluation	Introduction to electromagnetic theory Maxwell's equation and their derivation Contd...	
November	Displacement current Vector potential Scalar potential	Boundary conditions at the interface b/w two different media Contd… Gauss law and application	Uniformly charged infinite plane sheet and uniformly charged straight wire Contd….	Propagation of EMW Poynting	

TEACHING PLAN 2023-2024 (EVEN SEMESTER)

(January 2024 to April 2024)

Name : SHRUTI VERMA

Department: Physics

Sub:-B.Sc. Chem (Hons) Physics 4th Sem

Month	1st Week	2nd Week	3rd Week	4th Week	
January			Statistical Mechanics Probability, some probability considerations, combinations possessing maximum probability	combinations possessing minimum probability, distribution of molecules in two boxes. Case with weightage (general)	
February	Phase space, microstates and macrostates, statistical fluctuations constraints and accessible States Thermodynamical probability.	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. Evaluation of A and b. + REVISION	Application of B.E. Statistics to Plancks's radiation law, B.E. gas	
March	Quantum Mechanics Failure of (Classical) E.M. Theory. quantum theory of radiatio (old quantum theory), Photon, photoelectric effect and Einsteins photoelectric equation compton effect (theory and result).	Inadequancy of old quantum theory, de-Broglie hypothesis. Davisson and Germer experiment. G.P. Thomson experiment. Phase velocity group velocity,	Heisenberg's uncertainty principle. Time-energy and angular momentum, position uncertainty, Uncertainty principle from de-Broglie wave, (wave-partice duality). Gamma Ray Microscope,	Holi Break	
April	Electron diffraction from a slit. Derivation of time dependent	Computer Programming Computer organisation,	built in functions executable and non-executable statements, input	Dimesion arrays statement function and	

	Schrodinger wave equation. + REVISION	Binary representation, Algorithm development, flow charts and their interpretation. Fortran Preliminaries; Integer and floating point arithmetic expression,	and output statements, Formats, I.F. DO and GO TO statements + REVISION	function subprogram.	

TEACHING PLAN 2023-2024 (EVEN SEMESTER)

(January 2024 to April 2024)

Name : SHRUTI VERMA

Department: Physics

Sub:-B.Sc. NM 6th Sem Section A & B (Nuclear Physics)

Month	1st Week	2nd Week	3rd Week	4th Week	
January			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	
February	Determination of charge by Mosley law Determination of size of nuclei by Rutherford Back Scattering.	Interaction of heavy charged particles (Alpha particles), alpha disintegration and its theory Energy loss of heavy charged particle (idea of	Energetics of alpha-decay, Range and straggling of alpha particles. Geiger-Nuttal law.	Introduction of light charged particle (Beta-particle), Origin of continuous beta-spectrum (neutrino hypothesis) types of beta decay and	

		Bethe formula, no derivation),		energetics of beta decay,	
March	Energy loss of betaparticles (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. Nuclear reactions, Elastic scattering, Inelastic scatting, Nuclear disintegration, photoneclear reaction		
April	Radiative capture, Direct reaction, heavy ion reactions and spallation Reactions, conservation laws. Q-value and reaction threshold.	Nuclear Reactors General aspects of Reactor design. 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.	REVISION	

TEACHING PLAN 2023-2024 (EVEN SEMESTER)

(January 2024 to April 2024)

Name : SHRUTI VERMA

Department: Physics

Sub:-B.Sc. NM 6th Sem Section A & B (Atomic , Molecular and Laser physics)

Month	1st Week	2nd Week	3rd Week	4th Week	
January			Vector atom model, quantum numbers associated with vector atom model, penetrating and nonpenetrating orbits (qualitiative description)	spectral lines in different series of ailkali spectra, spin orbit interaction and doublet term seperation LS or	
February	Coupling jj coupling (expressions for inteaction energies for LS and jj coupling required).	Zeeman effect (normal and Anormalous) Zeeman pattern of D1 and D2 lines of Na-atom,	Diseete set of electronic energies of molecules. quantisation of Vibrational and ratiational energies Raman effect (Quantitative description)	Paschen, Back effect of a single valence electron system. Weak field Strak effect of Hydrogen atom.	
March	Stoke's and anti Stoke's lines.	Main features of a laser : Directionality, high intensity, high degree of coherence, spatial and temporal coherence	Einstein's coefficients and possibility of amplification, momentum transfer, life time of a level, kinetics of optical obsorption		
April	Threshold condition for laser emission, Laser pumping	He-Ne laser and RUBY laser (Principle, Construction and Working). Applications of laser in the field of medicine and industry.	REVISION	REVISION	

TEACHING PLAN 2023-2024 (ODD SEMESTER)
(July 2023 to Nov 2023)

Name:-Jyoti Narwat
Department: Physics
Subject:- Electricity and magnetism 1st Sem

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
July			Mathematical background Scalars and vectors Dot and cross products&numerical. Triple vector product. Scalar and vector fields, Differentiation of a vector,	Gradient of a scalar and its physical significance. Gauss divergence theorem, Stoke's theorem, Numerical practice, Electrostatic field (derivative of E from potential gradient).	Electric flux and Gauss law
August	Application of Gauss law to spherical shell Uniformly charged infinite plane sheet Derivation of Laplace equation.	Poisson equation. Uniformly charged straight wire Mechanical force of charged surface, energy per unit volume Numerical &textbook questions	Magnetostatic-magnetic induction, magnetic flux Solenoidal nature of vector field of induction Properties of B; divB=0	Electronic theory of diamagnetic substances (langevin's theory), Electronic theory of paramagnetic substances	Domain theory of ferromagnetism,
September	Cycle of magnetization and hysteresis, Hysteresis law and importance of hysteresis curve, Test.	Introduction to electromagnetic theory, Maxwell's equation and their derivation.	, Displacement current, Vector potential, Scalar potential	Boundary conditions at the interface b/w two different media	Test
October	Gauss law and application, Uniformly charged infinite plane sheet and uniformly charged straight wire.	Propagation of EMW, Poynting vector, Poynting theorem.	Revision of Syllabus	Revision of syllabus	

TEACHING PLAN 2023-2024(Odd Semester)

(July 2023 to Dec 2023)

Name :- Jyoti Narwat
Department: Physics

Sub:- Optics 3rd Sem

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
July			Introduction to waves, Types of waves, characterstics of a wave motion	Speed of a transverse waves in a uniform string. Speed of a longitunial wave in a fluid	Superpostion of waves (Physical idea)
August	Numericals, text book questions, Introduction to Fourier Series.	Fourier Theorem and Fourier series, Limitations of Fourier Theorem.	Importance of Fourier Theorem, Fourier sereies in the limit –pie to +pie,	Even and odd functions, Operation of Foureier series for different intervals,	Complex form of Foureier series, applications of Fourier Series,
September	Applications of Fourier Series, Text book questions	Numericals , written test, discussion , Introduction to Fourier transform	Fourier transforms, sin and cosine transform,	Theorems of Foureir transforms, applications of fourier transforms.	Matrix methods in paraxial optics, effect of translation and refarction Introduction to geometrical optics
October	Derivation of thin and thick lens formula, unit planes, Nodal planes, system of thin lenses, Numericals and text book questions, Introduction to aberrations, types of aberrations.	achromatism of two thin lenses in contact, Achromatic combination of two coaxial lenses at finite distance, Spherical aberration	Coma aberration, Astigmatism, curavture of the field, Distortion, Introduction to optics, Iterference by division of wavefont	Fresens biprism and its applications, lloyds Mirror, phase change on reflection	Revision of syllabus

Teaching Plan 2023-24 (Even Semester)

(January 2024 to April 2024)

Name: Dr. Neenu Saini   **Subject: Mechanics**
Department: Physics   **Class: B.Sc. 2nd Semester**

Month	1st Week	2nd Week	3rd Week	4th Week
January			Introduction of Theory of Relativity. Initial frame of Reference	Galilean Transformation Equations. Newtonian Relativity Principal
February	Michelson and Morley Experiment with assumptions, negative results, and conclusion	Lorentz Transformation Equations, Numerical problems. Length Contraction	Time Dilation, Twin paradox, Composition of Velocity.	Variation of mass and velocity, Mass energy equivalence

Month				
March	Introduction of elasticity, Types of elasticity, Hooke's Law.	Poisson's Ratio, Torsional Rigidity of the cylinder. Relation between elasticity constants	Bending of Beam, Cases of Cantilever loaded at the free end.	Cases of Cantilever loaded at the middle end. Numeric Problems. Introduction of Kinetic Theory of Gases. Degree of Freedom
April	Law of equipartition of energy. RMS speed and Average speed.	Velocity, energy, and Momentum Transport Phenomenon.	Mean free speed. Numerical analysis.	Assignment and Test Revision of all syllabus

Teacher in charge: Dr. Neenu Saini

Teaching Plan 2023-24 (Even Semester)

(January 2024 to April 2023)

Name: Dr. Neenu Saini   **Subject: Nuclear Physics**
Department: Physics   **Class: B.Sc. 6th Sem**

Month	1st Week	2nd Week	3rd Week	4th Week
January			Introduction to nuclear physics and properties of nucleus. Bibding energy, spin, parity, dipole moment, quadrupole moment	Bain-Bridge and double mass spectrograph **Class test**

Month				
February	Mosley law and Rutherford Back scattering **Doubt class**	Alpha particles and its theory, Bethe formula Energetics of alpha decay, Geiger-Nuttal law	Beta particle and its energetics, absorption of beta particles	Gamma rays,photoelectric effect **Doubt class**
March	Compton effect,Pair production	Nuclear reactions and Q-value	Nuclear reactors **Doubt class**	Linear accelerator,Tandom accelerator
April	Cyclotron,betatron accelerator **Class Test**	Ionization chamber,Proportional counter	G.M counter and scintillation counter	**Doubt class**

Teacher in charge: Dr. Neenu Saini

Teaching Plan 2023-24 (Odd Semester)

(August 2023 to December 2023)

Name: Dr. Neenu Saini   **Department: Physics**

Subject: Classical Mechanics   **Class: B.Sc. 1ˢᵗ Semester**

Month	1st Week	2nd Week	3rd Week	4th Week
August		Introduction to mechanics, Conservation laws for a single particle	Conservation laws for a system of particles	Concept of the center of mass, types of constraints with explanation Degrees of freedom,

Month	1st Week	2nd Week	3rd Week	4th Week
				numerics, textbook questions, class test
September	Generalized coordinates. Different quantities of G.C.	Different quantities of G.C.	Hamilton's variational principle. Lagrange's equation of motion	An alternate method of Lagrange's equation of motion Applications of Lagrange's equation of motion
October	Applications of Lagrange's equation of motion, Numeric.	Basic Concept of Rigid Body	Rotational Kinetic energy of a rigid body. Moment of inertia	Theorem of parallel axis and perpendicular axis Continued Theorem of the perpendicular axis. M. I. of Solid sphere
November	M. I. of Hollow sphere and Solid cylinder	M. I. of Hollow cylinder and Solid bar	Acceleration of a body rolling down an inclined plane	Numerical problem, Revision with class test

Teacher in charge: Dr. Neenu Saini

Teaching Plan 2023-24 (Odd Semester)

(July 2023 to December 2023)

Name: Dr. Neenu Saini   **Department: Physics**

Subject: Quantum Mechanics   **Class: B.Sc. 5th Semester**

Month	1st Week	2nd Week	3rd Week	4th Week

Month				
July				Introduction to Quantum Mechanics
August	Classical Mechanics Versus Quantum Mechanics	Failure of classical mechanics, Quantum theory of radiation	Photon, Photoelectric Effect, Compton Effect, Inadequacies of Old Quantum Mechanics	De-Broglie Hypothesis and Debroglie Equation Numerical doubt clearing & Class test
September	Davission and Germer Experiment, G.P. Thomson Experiment, Phase velocity	Group Velocity, Heisenberg Uncertainty principle	Time-energy and angular momentum, position uncertainty principle, Assignment	Textbook questions, Numericals, Class test Gamma-ray microscope experiment, Electron diffraction from a slit
October	Numerical and textbook questions	Derivation of Time-dependent wave equation and time-independent wave equation	Eigen values and eigen functions, wave function and its significance, normalization of wave functions	Concept of observable and operator Simple Harmonic oscillator
November	Simple harmonic oscillator energy and zero point energy	Particle in a one-dimensional box problem	Potential barrier (wave functions, energy eigenvalues, reflection coefficient, and transmission coefficient)	Numerical and Applications of Potential Barrier, Assignment Revision of the syllabus, Class test.

Teacher in charge: Dr. Neenu Saini

TEACHING PLAN (Odd Semester)

(August 2023 to December 2024)

Name: - Uma Shekhawat   **Department: Physics**

Subject: Classical Mechanics   **Class B.Sc. 1st Semester**

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
August		Introduction to mechanics. Conservation laws of linear momentum, angular momentum, and energy for a single particle.	Conservation laws of linear momentum, angular momentum, and energy for a system of particles.	Concept of the center of mass and equation of motion, Constrained motion, and types of constraints with explanation	Degrees of freedom, Numerical, textbook questions, class test.
September	Generalized coordinates, generalized displacement, Generalized velocity,	Acceleration, momentum, forces, and potential	Hamilton's variational principle. Lagrange's equation of motion from Hamilton's principle	The alternate method of Lagrange's equation of motion. Numerical problems.	Linear harmonic oscillator, Atwood machine, numerical problems
October	Lagrange's equation of motion for a simple pendulum, Various numerical problems	Basic Concept of Rigid Body and Small Derivations	Rotational Kinetic energy of a rigid body, Radius of Gyration, Moment of inertia,	The theorem of parallel axis and perpendicular axis,	Continued Theorem of the perpendicular axis, Moment of inertia of Solid sphere,
November	Moment of inertia of Hollow sphere and Solid cylinder.	Moment of Inertia of Hollow cylinder and Solid bar.	Acceleration of a body rolling down an inclined plane.	Numerical problem. Revision with class test	Revision with the class test.

Teacher Incharge-Uma shekhawat

TEACHING PLAN (Odd SEMESTER)

(September 2023 to December 2024)

Name :- uma shekhawat   **Department: Physics**

Subject: Computer programming and Thermodynamics   **Class: B.Sc 3rd Semester**

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
August	Introduction to Thermodynamics, Laws of thermodynamics	Various terms used in thermodynamics, Carnot theorem, the absolute scale of temperature	Absolute zero, entropy, T-S diagram, Nernst heat law	Joules free expansion, joules Thomson Experiment	Joules Thomson effect, Liquification of gases.
September	Clausius Clayperon heat equations, Phase diagram, Triple point	Thermodynamical relations, and applications	Thermodynamic functions and relation between them, numerical	Introduction to fundamentals of computer. Types of computers	Computers Applications. Computer organization, Number systems
October	Binary Number system and its operations.	Computer algorithm and examples	Development of flow chart for different problems	Introduction to FORTRAN programming, FORTRAN program organization	FORTRAN constants, FORTRAN Variables, Class Test
November	Various FORTRAN statements i.e. Input, Output, Read, write, End, Stop, etc.	Do statement, GoTo statement, IF statement, Loop statement, dimension arrays	Executable and Nonexecutable statements	Numerical problem. Revision with class test	Revision with the class test.

Teacher Signature: Uma Shekhawat

TEACHING PLAN 2023-24 (Even SEM)

(January 2024 to April 2024)

Name :- Dr. Uma Shekhawat   **Department: Physics**

Sub: Classical Mechanics Physics   **Class: B.Sc. 2nd Semester**

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
January	Introduction of Theory of Relativity. Initial frame of Reference	Galilean Transformation Equations. Newtonian Relativity Principal	Michelson and Morley Experiment with assumptions, negative results, and conclusion	Lorentz Transformation Equations. Length Contraction	Time Dilation, Twin paradox, Composition of Velocity.
February	Variation of mass and velocity, Mass energy equivalence.	Introduction of elasticity, Types of elasticity, Hooke's Law.	Poisson's Ratio, Torsional Rigidity of the cylinder. Relation between elasticity constants.	Bending of Beam, Cases of Cantilever loaded at the free end.	Cases of Cantilever loaded at the middle end. Numeric Problems.
March	Introduction of Kinetic Theory of Gases. Degree of Freedom	Law of equipartition of energy. RMS speed and Average speed.	Velocity, energy, and Momentum Transport Phenomenon.	Mean free speed. Numerical analysis.	
April	Assignment and Test	Revision of all syllabus	Revision	Revision	

Teacher Incharge – Dr. Uma Shekhawat

TEACHING PLAN 2023-24 (EVEN SEM)

(January 2024 to April 2024)

Name :- Dr. Uma Shekhawat   **Department: Physics**

Sub: Statistical Physics   **Class: B.Sc 4th Semester**

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
January	Introduction of Statistical Physics. Types of Statistics	Probability, Permutation, Combination	Microstate and Macrostates. Coin Tossing and Dice cases	Binomial Theorem. All cases of microstate and macrostates.	Phase Space. The volume of Phase space.
February	Explanation and difference between types of statistical physics.	Maxwell Distribution Law and Derive case of the Most probable state.	Numeric Problems on probability, coin cases.	Assignment and Test Week	Bose-Einstein Distribution Law
March	Bose-Einstein Energy and Condensation	Bose-Einstein Degeneracy and Numeric	Black Body Radiation and absolute energy	Fermi Dirac Distribution Law	Fermi Dirac Energy and condensation
April	Assignment and Test	Revision of all syllabus	Revision	Revision	

Teacher Incharge – Dr. Uma Shekhawat

TEACHING PLAN 2023-24 (Odd SEMESTER)
(July 2023 to November 2023)

Name :- Rimpi Goyal, Department: Physics

Subject: Computer programming and Thermodynamics
Class: B.Sc 3rd Semester

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
July			Introduction to computer programming	Introduction to thermodynamics	
August	Introduction to fundamentals of computer. Types of computers.	Computers Applications. Computer organization, Number systems,	Binary Number system and its operations.	Computer algorithm and examples.	Development of flow chart for different problems.
September	Introduction to FORTRAN programming, FORTRAN program organization.	FORTRAN constants, FORTRAN Variables, Class Test	Various FORTRAN statements i.e. Input, Output, Read, write, End, Stop, etc.	Do statement, GoTo statement, IF statement, Loop statement, dimension arrays.	Executable and Nonexecutable statements.

October	Introduction to Thermodynamics, Laws of thermodynamics	Various terms used in thermodynamics, Carnot theorem, the absolute scale of temperature	Absolute zero, entropy, T-S diagram, Nernst heat law	Joules free expansion, joules Thomson Experiment	Joules Thomson effect, Liquification of gases.
November	Clausius Clayperon heat equations, Phase diagram, Triple point	Thermodynamical relations, and applications	Thermodynamic functions and relation between them, numerical		

Teacher Signature: Rimpi Goyal

Name :-Rimpi Goyal **Department: Physics**

Sub: Statistical Physics
Class: B.Sc 4th Semester

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
January	Introduction of Statistical Physics. Types of Statistics	Probability, Permutation, Comb	Microstate and Macrostates. Coin Tossing and Dice cases	Binomial Theorem. All cases of microstate and	Phase Space. The volume of Phase space.

		ina tio n		macros tates.	
F e br u ar y	**Explana tion and differenc e between types of statistica l physics.**	**Maxwell Distributio n Law and Derive case of the Most probable state.**	**Numeric Problems on probabilit y, coin cases.**	**Assign ment and Test Week**	**Bose-Ei nstein Distribu tion Law**
M ar c h	**Bos e-Ei nstei n Ener gy and Con dens atio n**	**Bose- Einst ein Dege nerac y and Nume ric**	**Black Body Radiatio n and absolute energy**	**Ferm i Dirac Distri butio n Law**	**Ferm i Dirac Ener gy and cond ensa tion**
A pr il	**Assig nment and Test**	**Revi sion of all sylla bus**	**Revision**	**Revision**	

Teacher Incharge – Rimpi Goyal

Name :-Rimpi Goyal Department: Physics

Sub: Statistical Physics
Class: B.Sc 4th Semester   Class: B.Sc 4th Semester

Month	1st Week	2nd Week	3rd Week	4th Week	5th Week
January	Introduction of Statistical Physics. Types of Statistics	Probability, Permutation, Combination	Microstate and Macrostates. Coin Tossing and Dice cases	Binomial Theorem. All cases of microstate and macrostates.	Phase Space. The volume of Phase space.
February	Explanation and difference between types of statistical physics.	Maxwell Distribution Law and Derive case of the Most probable state.	Numeric Problems on probability, coin cases.	Assignment and Test Week	Bose-Einstein Distribution Law
	Bose-Einstein Ene	Bose-Einstein Degenera	Black Body Radiation and absolute energy	Fermi Dirac Distributio	Fermi Dirac Ener

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A pr il	Assig nment and Test	Rev isio n of all syll abu s	Revision	Revision	

Teacher Incharge – Rimpi Goyal