Lesson Plan 2025-26 (Odd Sem)
Physics Department

Name: Ms. Neha
Class: B.Sc. Life Sc. 1st Sem
Subject Name: Physics in Everyday Life
Sub Code : 25PHY203DS04
Number of days: 1,2,5,6

28 July- 28 August	MECHANICS: Every day activities related to Force, weight, work, energy, power and centrifuge; washing machine. Numericals and Test.
29 August-29sept	HEAT: Variation of boiling point with pressure, pressure cooker, cooling by expansion, refrigerator, air conditioner, Bernoulli principle Bunsen burner, aero-plane. Numericals and Test.
30sept-13 Oct	SOUND AND OPTICS: Sound waves, Doppler Effect, power of lens, long sight and short sight, microscope, telescope, binocular camera, video camera. Numericals and Test.
14 Oct-22oct	***Diwali Vacation***
23Oct- 18 Nov	ELECTRICAL AND ELECTRONIC APPLIANCES: Working of the tube light and fan, kilowatt hour, fuse and heating elements, microwave oven, electric heater, photoelectric effect. Test and Assignments.

Name: Ms. Neha
Class: M.Sc. Physics 3rd Sem
Subject Name: Electronics
Sub Code : 25PHY203DS04
Number of days: 1,2,5,6

28 July-28 August	Unit 1: Bipolar junction Transistor (BJT): Transistor action, Transistor biasing techniques and characteristics, Amplifying action, AC/DC load line, Transistor models and parameters, Equivalent circuits, Two-Port devices and Hybrid model, Transistor Hybrid model, Transistor h-parameters, Conversion for h-parameter for three Transistor Configurations, Analysis of a Transistor Amplifier Circuit for CE, CB, CC, Comparison of Transistor Amplifier Configurations, Linear Analysis of a Transistor Circuit, Miller's Theorem and its Dual, Cascading Transistor Amplifiers, classification of amplifiers, frequency response, RC coupled amplifier and its frequency response.
29 August-29sept	Unit 2: Feedback-positive and negative feedback, Effect of negative feedback on gain, Non-linear distortion, input resistance, Frequency response, Voltage series and shunt feedback, Current series feedback. Transistor Power amplifiers: Class A, Class B, Class A push pull and Class B push pull amplifier Principle of oscillations, condition for sustained oscillation, RF Oscillators using BJT, Hartley, Colpitts, Crystal Oscillator (Principle of working and frequency oscillation); AF Oscillators using BJT: Wein Bridge, Phase shift Oscillators. Multivibrator (Astable, Bistable, Monostable).
30sept-13 Oct	Unit 3: Differential amplifier, CMRR, circuit configuration, emitter coupled supplied with constant current, transfer characteristics, block diagram of Op. Amp. Off-set currents and voltages, PSRR, Slew rate, universal balancing techniques, Inverting and non-inverting amplifier, basic applications- summing, scaling, current to voltage and voltage to current signal conversion, differential dc amplifier, voltage follower, bridge amplifier, AC-coupled amplifier. Integration, differentiation, analog computation, Butterworth active filters circuits.
14 Oct-22oct	***Diwali Vacation***
23Oct-18 Nov	Unit 4: Comparators, AC/DC converters: Half wave & full wave rectifier, clamping circuits, Logarithmic amplifier, antilogarithmic amplifier, sample and hold circuits Digital to analog conversion –ladder and weighted resistor types, analog to digital conversion-counter type, regenerative comparator (Schmitt trigger), Oscillators using op-amp,: Feedback, Square wave generator, pulse generator, triangle wave generator. Sinusoidal oscillators: Phase shift, Colpitts, Hartley and Wein Bridge oscillator.

Name: Ms. SANKET
Class: M.Sc. (Physics) Semester-III
Paper code: 25PHY203DS06
Subject Name: Computational Physics – I
Number of Days: 1-4

28 July- 15 Aug	Numerical Integration: Newton-cotes formulae: Trapezoidal rule, Simpson's 1/3 rule, error estimates in Trapezoidal rule and Simpson 1/3 rule using Richardson deferred limit approach; Gauss-Legendre quadrature method; Monte Carlo (mean sampling) method for single, double and triple integrals. Numerical Differentiation: Taylor Series method; Generalized numerical differentiation: truncation errors. Roots of Linear, Non-linear Algebraic and Transcendental equations: Newton-Raphson method; convergence of solutions. Curve Fitting: Principle of least square; Linear regression; Polynomial regression; Exponential and Geometric regression.Test
18 Aug – 18 Sept	Interpolation: Finite differences; Interpolation with equally spaced points; Gregory - Newton's Interpolation formula for forward and backward interpolation; Interpolation with unequally spaced points: Lagrangian interpolation, Solution of Simultaneous Linear Equations: Gaussian elimination method, Pivoting; Gauss- Jordan elimination method; Matrix inversion. Eigen values and Eigen vectors: Jacobi's method for symmetric matrix test
19 sept - 13 Oct	Numerical Solution of First Order Differential Equations: First order Taylor Series method; Euler's method; Runge-Kutta methods; Predictor corrector method; Elementary ideas of solutions of partial differential equations, Numerical Solutions of Second Order Differential Equation: Initial and boundary value problems: shooting methods. Assignment
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 30 Nov	Computer basics and operating system: Elementary information about digital computer principles; basic ideas of operating system, DOS and its use (using various commands of DOS); Compilers; interpreters; Directory structure; File operators. Introduction to FORTRAN 77:Data types: Integer and Floating point arithmetic; Fortran variables; Real and Integer variables; Input and Output statements; Formats; Expressions; Built in functions; Executable and non-executable statements; Control statements; Go To statement; Arithmetic IF and logical IF statements; Flow charts; Truncation errors, Round off errors; Propagation of errors, Block IF statement; Do statement; Character DATA management; Arrays and subscripted variables; Subprograms: Function and SUBROUTINE; Double precision; Complex numbers; Common statement; New features of FORTRAN 90... Revision Test

Name: Ms. SANKET
Class: B.Sc. Single Major (Physics) Semester-I
Paper code: 24PHYS401SE01
Subject Name: Basic Instrumentation Skills
Number of Days: 5-6

15 july- 15 Aug	Basic of Measurement: Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects. Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance. Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/Multimeter and their significance. AC milli-voltmeter: Type of AC millivolt meters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac milli-voltmeter, Specifications and their significance. Test
18 Aug – 18 Sept	Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only– no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance. Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working. Test
19 sept - 13 Oct	Generators and Transformers: DC Power sources. AC/DC generators. Inductance, capacitance, and impedance. Operation of transformers. Electric Motors: Single-phase, three phase & DC motors. Basic design. Interfacing DC or AC sources to control heaters and motors. Speed & power of ac motor. Assignment . Electrical Protection: Relays. Fuses and disconnect switches. Circuit breakers. Overload devices. Ground-fault protection. Grounding and isolating. Phase reversal. Surge protection. Relay protection device.
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	Electrical Wiring: Different types of conductors and cables. Basics of wiring-Star and delta connection. Voltage drop and losses across cables and conductors. Instruments to measure current, voltage, power in DC and AC circuits. Insulation. Solid and stranded cable. Conduit. Cable trays. Splices: wire nuts, crimps, terminal blocks, and solder. Preparation of extension board. Revision and test

Name: Ms. SANKET
Class: B.Sc. Single Major (Physics) Semester-III
Paper code: 25PHYS403DS01
Subject Name: Thermal Physics
Number of Days: 1-2

28 July- 15 Aug	Zeroth and First Law of Thermodynamics: Extensive and intensive Thermodynamic Variables, Thermodynamic Equilibrium, Zeroth Law of Thermodynamics & Concept of Temperature, Concept of Work & Heat, State Functions, First Law of Thermodynamics and its differential form, Internal Energy, First Law & various processes, Applications of First Law: General Relation between CP and CV, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Co-efficient. Test
18 Aug – 18 Sept	Second Law of Thermodynamics: Reversible and Irreversible process with examples. Conversion of Work into Heat and Heat into Work. Heat Engines. Carnot's Cycle, Carnot engine & efficiency. Refrigerator & coefficient of performance, 2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence. Carnot's Theorem. Applications of Second Law of Thermodynamics: Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale. test
19 sept - 13 Oct	Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy. Entropy of a perfect gas. Principle of Increase of Entropy. Entropy Changes in Reversible and Irreversible processes with examples. Entropy of the Universe. Entropy Changes in Reversible and Irreversible Processes. Principle of Increase of Entropy. Temperature–Entropy diagrams for Carnot's Cycle. Third Law of Thermodynamics. Unattainability of Absolute Zero. Thermodynamic Potentials and Maxwell's Thermodynamic Relations: Extensive and Intensive Thermodynamic Variables. Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy. Assignment
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	Their Definitions, Properties and Applications. Surface Films and Variation of Surface Tension with Temperature. Magnetic Work, Cooling due to adiabatic demagnetization, First and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations. Derivations and applications of Maxwell's Relations, Maxwell's Relations:(1) Clausius Clapeyron equation, (2) Values of Cp-Cv, (3) Tds Equations, (4) Joule-Kelvin coefficient for Ideal and Van der Waal Gases, (5) Energy equations, (6) Change of Temperature during Adiabatic Process. Revision Test

Name : Neeraj Kadian
Class : B.Sc II (Physical science) 3rd Sem
Paper code : 25PHY403DS01
Subject Name : Optics
Number of days : (1-2)

28 July – 31Aug	INTERFERENCE: Interference by Division of Wave front: Young's double slit experiment, Coherence, Conditions of interference, Fresnel's biprism and its applications to determine the wavelength of sodium light and thickness of a mica sheet, phase change on reflection. Interference by Division of Amplitude: Plane parallel thin film, production of colours in thin films, classification of fringes in films, Interference due to transmitted light and reflected light, wedge shaped film, Newton's rings
1 Sept – 13 Oct	DIFFRACTION Fresnel's diffraction: Huygens-Fresnel's theory, Fresnel's assumptions, rectilinear propagation of light, diffraction at a straight edge, rectangular slit and diffraction at a circular aperture. Fraunhoffer diffraction: Single slit diffraction, double slit diffraction, plane transmission grating spectrum, dispersive power of grating, limit of resolution, Rayleigh's criterion, resolving power of telescope and a grating.
14 Oct - 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	POLARIZATION: Polarisation by reflection, refraction and scattering, Malus Law, Phenomenon of double refraction, Huygens's wave theory of double refraction (Normal and oblique incidence), Analysis of polarized 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 optical rotation, Specific rotation, Polarimeters (half shade and Biquartz)
19Nov– 30 Nov	LASERS: Basic concept of absorption and emission of radiations, amplification and population inversion; Main components of lasers: (i) Active Medium (ii) Pumping (iii) Optical Resonator; Properties of laser beam: Monochromaticity, Directionality, Intensity, Coherence (Spatial & Temporal coherence); Metastable state, Excitation mechanism and Types of Lasers (He-Ne Laser & Ruby Laser), Applications of Lasers. FIBRE OPTICS: Optical fibres and their properties, Principal of light propagation through a optical fibre, Acceptance angle and numerical aperture, Types of optical fibres: Single mode and multimode fibres, Advantages and Disadvantages of optical fibres.

Name: Neeraj Kadian
Class: M.Sc Physics
Paper code: Phy- 24PHY201DSO2
Subject Name: Classical Mechanics
Number of days: (4-6)

8 Aug – 31 Aug	Survey of Elementary Principles and Lagrangian Formulation: Newtonian mechanics of one and many particle systems, Conservation laws, Constraints and their classification, Generalized coordinates and momenta, Principle of virtual work, D' Alembert's principle and Lagrange's equation, Velocity dependent potentials and dissipation function, Simple applications of Lagrangian formulation, Cyclic coordinates, Symmetries of space and time and conservation laws, Invariance of Lagrangian under Galilean transformation.
1 Sept – 13 Oct	Moving coordinate systems and Motion in a central force field: Rotating frames, inertial forces, terrestrial applications of Coriolis force, Two body problem: Reduction to equivalentone body problem, Central force definition and characteristics, the equation of motion and first integrals, differential equation for the orbit, general analysis of orbits, condition for closure and stability of circular orbits, Kepler's laws and equations, Rutherford scattering.SEMINAR-1
14 oct – 22 Oct	***Diwali Vacation***
23oct-18 Nov	Legendre Transformation and Hamilton's equations of motion, Some techniques of calculus of variation, Variational principle, Hamilton's principle from D'Alembert's principle, Lagrange's equation from Hamilton's principle, Hamilton's equations from variational principle, variation and end points, Principle of least action and its forms, Hamilton-Jacobi equation and their solutions, Use of Hamilton-Jacobi method for the solution of Harmonic oscillator problem, Hamilton's principle function, Hamilton's characteristic function and their properties.SEMINAR-2
19Nov– 30 Nov	Canonical transformations, Generating functions, Properties of Poisson bracket, Equation of motion in Poisson bracket, Angular momentum and Poisson bracket relations, Jacobi identity, Invariance of Poisson brackets using canonical transformations, Potential Energy and equilibrium: Stable, unstable and neutral equilibrium, One-dimensional Oscillator, Two coupled oscillators: Solution of differential equation to find normal coordinates and normal modes, Theory of small oscillations, Examples of coupled oscillators: Two coupled pendulum, double pendulum, Free vibrations of a linear triatomic molecule.

Name: Renu Kumari
Class: M.Sc Physics
Paper code: Phy- 24PHY201DSO1
Subject Name: Mathematical Physics
Number of days (1-4)

8 Aug – 31 Aug	Vector spaces, Norm of a Vector, Linear independence & dependence, Basis and dimension, Isomorphism of Vector spaces, Scalar/Inner product of vectors, Orthonormal basis, GramSchmidt Orthogonalization process, Linear operators, Matrices, Cayley-Hamiltion Theorem, Inverse of matrix, Orthogonal, Unitary and Hermitian matrices, Eigenvalues and eigenvectors of matrices, Similarity transformation, Matrix diagonalization, Simultaneous diagonalization and commutativity
1 Sept – 13 Oct	Second order linear differential equation with variable coefficients, Ordinary point, Singular point, Series solution around an ordinary point, Series solution around a regular singular point; the method of Frobenius, Wronskin and getting a second solution, Solution of Legendre's equation, Solution of Bessel's equation, Solutions of Laguerre and Hermite's equations .
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	Special functions, Generating functions for Bessel function of integral order Jn(x), Recurrence relations, Integral representation; Legendre polynomials Pn(x), Generating functions for Pn(x), Recurrence relations, orthogonality, Rodrigue's Relation; Hermite Polynomials; Generating functions, Rodrigue's relation &orthogonality for Hermite polynomials; Laguerre polynomials; Generating function and Recurrence relations,Orthogonality, Rodrigue's Relation,
19Nov– 30 Nov	The Gamma Function, The Dirac – Delta Function.Integral transform, Laplace transform, Properties of Laplace transforms such as first and second shifting property, Laplace Transform of Periodic Functions, Laplace transform of derivatives, Laplace Transform of integrals, Inverse Laplace Transform by partial fractions method, Fourier series, Evaluation of coefficients of Fourier series Cosine and Sine series, Applications of Fourier Series, Fourier Transforms, Fourier sine Transforms, Fourier cosine Transforms, Fourier transform of derivatives, Applications of Fourier Transforms

Name: Renu Kumari
Class: Final year (Hons) Physics
Paper code: PHY 506
Subject Name: *Nano technology*
Number of Days – (5-6)

28 July- 15 Aug	Introduction of nano physics, properties of nano materials, example of nano materials.
18 Aug – 18 Sept	Free electron theory and its features ,drawbacks and success of free electron theory, idea of band structure, metal ,insulator and semiconductor
19 sept - 13 Oct	Density of state in bands , density of states in 1D ,2D, 3D, AND 0D . variation of density of state with band gap and size of crystal
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	K P model, Brillion zones, Effective mass, electron confinement in two D AND 1D. Idea of quantum well structure, quantum dots ,quantum wires, test, assignments and numerical problems

Name: Renu Kumari
Class: B.Sc Physical Science 3rd sem
Paper code: 25PHY403SE01
Subject Name: Workshop Skills in Physics
Number of Days – (5-6)

28 July- 15 Aug	Measuring units. conversion to SI and CGS. Familiarization with meter scale, Vernier calliper, Screw gauge and their utility. Measure the dimension of a solid block, volume of cylindrical beaker/glass, diameter of a thin wire, thickness of metal sheet, etc. Use of Sextant to measure height of buildings, mountains, etc.
18 Aug – 18 Sept	Use of Multimeter. Soldering of electrical circuits having discrete components (R, L, C, diode) and ICs on PCB. Network theorems: Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum Power Transfer Theorem, Basics of Power Supplies, AC Power Supplies: Characteristics, use in basic circuits. DC Power Supplies: Fixed voltage vs. variable voltage supplies. Components of power supplies:
19 sept - 13 Oct	Transformers, rectifiers (half-wave, full-wave), filters, and regulators. Voltage Regulation and Ripple Reduction, Concepts of regulation, ripple, and stability. Use of capacitors, Zener diodes, and IC voltage regulators (e.g., LM317). Introduction to C.R.O., Basic structure and working of a C.R.O. Electron gun, deflection system, and phosphor screen. Block diagram and function of each component.
14 Oct – 22 Oct	***Diwali Vacations***
23 Oct – 18 Nov	Operating a C.R.O. Adjusting controls: Time base, volts/div, focus, intensity, and trigger. Connecting probes and setting ground reference. Applications of C.R.O. Measurement of voltage, frequency, and phase difference. Observation of waveforms: Sine, square, and triangular waves. Troubleshooting electrical circuits

Name: Mr. Pardeep Kumar
Class: B.Sc III(NM) Vth Sem
Paper code: Phy-502
Subject Name: Quantum Mechanics
Number of days: 3&4 SEC-A

28 July- 28 August	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.
29 August-29sept	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, wave functions and its significance.
30 Sept-13 Oct	Normalization of wave function, concept of observable and operator. 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.
14 Oct-22oct	***Diwali Vacation***
23Oct- 18 Nov	Free particle in one dimensional box (solution of schrodinger wave equation, eigen function, eigen values, quantization of energy and momentum, nodes and antinodes, zero point energy). i) One-dimensional potential barrie E>V0 (Reflection and Transmission coefficient. ii) One-dimensional potential barrier, E>V0 (Reflection Coefficient, penetration of leakage coefficient, penetration depth).

Name: Mr. Pardeep Kumar
Class: B.Sc. 3rd Sem life sc.
Subject Name: Elements of Modern Physics
Sub Code : 25PHY403MI01
Number of days: 5&6

28 July- 28 August	**Unit 1: Foundations of Quantum Physics:** Planck's quantum hypothesis and the concept of photons. Photoelectric effect: Qualitative explanation and applications. Compton scattering: Basic understanding. De Broglie wavelength and matter waves, Davisson-Germer experiment: Experimental verification of matter waves.
29 August-29Sept	**Unit 2: Atomic Structure and Wave-Particle Duality:** Limitations of Rutherford's model: Atomic instability and discrete spectra. Bohr's quantization rule and energy levels of hydrogen-like atoms (qualitative only). Wave-particle duality and Heisenberg uncertainty principle: Simple examples and applications. Energy-time uncertainty principle
30 Sept-13 Oct	**Unit 3: Basics of Quantum Mechanics**: Two-slit interference experiment with photons and particles, Introduction to Schrödinger equation, Physical interpretation of the wave-function and probability concepts. One-dimensional infinitely rigid box: Energy levels and relevance in quantum dots. Tunnelling effect, Step potential (qualitative only) and applications.
14 Oct-22oct	***Diwali Vacation***
23Oct- 18 Nov	**Unit 4: Nuclear Physics and Applications:** Basic structure of the nucleus: Size, atomic weight, and binding energy. Radioactivity: Stability of nucleus, laws of decay, and half-life. Overview of α decay, β decay (neutrino hypothesis), and γ-ray emission. Introduction to nuclear fission and fusion: Energy generation, mass deficit, and thermonuclear reactions. Applications of nuclear energy: Brief on nuclear reactors and their principles.

Name: Mr. Pardeep Kumar
Class: M.Sc. 3rd Sem Physics
Subject Name: Nuclear and Particle Physics
Sub Code : 25PHY203DS01
Number of days: 5&6

28 July- 28 August	Unit 1: Two nucleon problem: Common potentials used for calculation of nuclear forces viz. Wigner, Majorana, Bartlett and Heisenberg potentials, The ground state of deuteron, Square well solution for the deuteron, Qualitative features of Nucleon – nucleon scattering, Effective range theory in n – p scattering and Significance of sign of scattering length; Meson theory of nuclear force (Qualitative discussion);Types of nuclear reactions: compound and direct nuclear reactions, Reaction cross – section, Reaction cross-section in terms of partial wave treatment, Balance of mass and energy in nuclear reactions, Q equation and its solution.
29 August-29sept	Unit 2: Liquid drop model: Similarities between liquid drop and nucleus, Semi-empirical mass formula, Mass Parabolas (Prediction of stability against β-decay for members of an Isobaric family), Stability limits against spontaneous fission, Merits and limitations of Liquid drop model; Shell model: Experiment evidences for shell effect, Magic numbers, Main assumptions of the single particle shell model, Spin-orbit coupling in single particle shell model, Estimation of spin, parities and magnetic moments of nuclei by single particle shell model.
30Sept-13 Oct	Unit 3: Nuclear Decays: Alpha (α) decay, α- disintegration energy, Range of α-particles, Range – energy relationship for α-particles and Geiger – Nuttall law; Beta decay, Pauli's neutrino hypothesis, Fermi theory of beta decay, Curie plot, selection rules for beta decay, Fermi and Gamow-Teller Transitions, Detection and properties of neutrino; Gamma decay, Multipole transitions in nuclei, Angular momentum and parity selection rules; Internal conversion
14 Oct-22oct	***Diwali Vacation***
23Oct- 18 Nov	Unit 4: Elementary Particle Physics: Classifications of elementary particles: fermions and bosons, particles and antiparticles; Fundamental interactions in nature; Type of interaction between elementary particles: Symmetry and conservation laws; Classification of hadrons: Strangeness, Hypercharge, Gelleman - Nishijima formula, Elementary ideas of CP and CPT invariance; Quark model, Baryon Octet, Meson Octet, Baryon Decuplet, Gell-Mann-Okubo formula for octet and decuplet, the necessity of introducing the colour quantum number.

Name: Dr. Surender Kumar
Class: Final year (Hons) Physics
Paper code: PHY 502
Subject Name: Electromagnetic Theory -1
Days : 5-6

28 July – 28 August	Maxwell equations and Displacement current, Vector and Scalar potentials, Gauge transformations, Lorentz and Coulomb gauge
29August – 29 September	Wave equations. Plane waves in dielectric media, Poynting theorem and Poynting vector. Energy density, Physical concept of electromagnetic (e.m) field momentum density and e.m field angular momentum density
30 September - 13 October	Boundary conditions at interface between different media, Reflection and refraction of a plane wave, Fresnel Formulae for dielectric interface
14 October-22 October	***Diwali Vacation***
23 October – 18November	Total internal reflection Brewster's angle, Conductivity of ionized gas Propagation of e.m. waves in ionosphere

Name: Dr. Surender Kumar
Class: Final year (Hons) Physics
Paper code: PHY 503
Subject Name: Statistical Physics-I
Number of Days – 3-4

28 July – 28Aug	Introduction to statistical physics, Basic concepts of SM, Thermo-dynamical probability, Entropy, Partition function.
29 Aug – 29 Sept	MB statistics, Thermo-dynamical function of ideal gas and their relation with partition function. Entropy of Ideal gas and Gibbs paradox, Law of equipartition of energy and its applications, Introduction to radiation, assignment and Test, Numerical problems
30 Sept – 13Oct	Properties of Radiations, black body radiation, krichoff law, Wiens displacement law, Stefens law , Planks law of black body radiation, deduction of wiens displacement law , steffens law with planks law.
14 Oct - 22 Oct	***Diwali Vacation***
23Oct – 18 Nov	Introduction of LASER, basic principle and working. Thermal eq. of radiation , principle of detailed balance ,Einstein A and B coefficients, two level and three level systems, test ,assignments,

Name: Dr. Preeti Chhokkar
Class: B.Sc II (Single Major) IIIrd Sem
Paper code: 25PHYS403DS02
Subject Name- Vibrational &Wave optics
Number of days: 3,4

28 July- 15 Aug	**Unit 1:** Superposition of Collinear Harmonic oscillations: Linearity and Superposition Principle. Superposition of two collinear oscillations having (1) equal frequencies and (2) different frequencies (Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and (2) equal frequency differences.
18 Aug – 18 Sept	**Unit 2:** Wave equation. Traveling waves, Plane and spherical waves. Superposition of two harmonic waves. Standing waves on a string. Superposition of N harmonic waves. Pulses and wave packets. Introduction to different models, light waves, electromagnetic nature of light waves. Coherence and Interference: Interaction of independent light sources. Classification in terms of division of amplitude and division of wave front. Young's double slit experiment.
19 Sept - 13 Oct	**Unit 3:** Lloyd's mirror and Fresnel's biprism. Interference in thin films parallel and wedge-shaped films. Fringes of equal inclination (Haidinger fringes) and fringes of equal thickness (Fizeau fringes). Michelson's interferometer: Theory, form of fringes (mention only), applications, visibility of fringes. Theory of partial coherence. Coherence time and coherence length, i.e., temporal and spatial coherence. Fabry-Perot interferometer: Theory, Airy's formula, sharpness of fringes, finesse, visibility of fringes
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	**Unit 4:** Fraunhofer diffraction: Single slit, rectangular and circular aperture. Multiple slits. Plane diffraction grating. Resolving power and depressive power of a plane diffraction grating. Fresnel diffraction: Fresnel's integrals, Cornu's spiral, Fresnel diffraction pattern at a straight edge, a slit and a wire (qualitatively using Cornu's spiral). Holography: Principle of holography, recording and reconstruction method and its theory as interference between two plane waves.

Name: Dr. Preeti Chhokkar
Class: B.Sc II(Single Major) IIIrd Sem
Paper code: 25PHYS402SE01
Subject Name- Applied Optics
Number of days: 5,6

28 July- 15 Aug	**Unit 1:** Fresnel diffraction: Fresnel's integrals, Cornu's spiral, Fresnel diffraction pattern at a straight edge, a slit and a wire (qualitatively using Cornu's spiral). Fraunhofer diffraction: Single slit, rectangular and circular aperture. Multiple slit. Plane diffraction grating. Resolving power and depressive power of a plane diffraction grating.
18 Aug – 18 Sept	**Unit 2:** Concept of Spatial frequency filtering, Fourier transforming property of a thin lens, Fourier Transform Spectroscopy (FTS): measuring emission and absorption spectra, applications in atmospheric remote sensing, NMR spectrometry, and forensic science.
19 Sept - 13 Oct	**Unit 3:** Holography: Introduction, Basic principle and theory, recording and reconstruction processes, Requirements of holography-coherence, Types of holograms, The thick or volume hologram, Multiplex hologram, white light reflection hologram, application of holography in microscopy, interferometry, and character recognition.
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	**Unit 4:** Optical fibres: Introduction and historical remarks, Total Internal Reflection, Basic characteristics of the optical fibre: Principle of light propagation through a fibre, the coherent bundle, The numerical aperture, Attenuation in optical fibre and attenuation limit; Single mode and multimode fibres, Fibre optic sensors: Fibre Bragg Grating.

Name: Dr. Preeti Chhokkar
Subject Name: Quantum Mechanics
Class: B.Sc III(NM) Vth Sem
Number of days: 1,2 SEC-B
Paper code: Phy-502

28 July- **14 Aug**	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.
16 Aug – 18 Sept	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, wave functions and its significance.
19 Sept - **13 Oct**	Normalization of wave function, concept of observable and operator. 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.
14 Oct – **22 Oct**	**Diwali Vacation**
23 Oct – 18 Nov	Free particle in one dimensional box (solution of schrodinger wave equation, eigen function, eigen values, quantization of energy and momentum, nodes and antinodes, zero point energy). i) One-dimensional potential barrie E>V0 (Reflection and Transmission coefficient. ii) One-dimensional potential barrier, E>V0 (Reflection Coefficient, penetration of leakage coefficient, penetration depth).

Name: Mrs. NEELAM
Class: B.Sc. I (Single Major) Semester-1
Paper code: 24PHYS401DS02
Subject Name: Electricity and Magnetism
Number of days: Wednesday-Thursday

28 July- 15 Aug	Magnetic Properties of Matter: Force on a dipole in an external field, Electric currents in Atoms, Electron spin and Magnetic moment, types of magnetic materials, Magnetization vector (M), Magnetic Intensity (H), Magnetic Susceptibility and permeability, Relation between B, H and M, Electronic theory of dia and Para-magnetism, Domain theory of ferromagnetism (Langevin's theory), Cycle of Magnetization- B-H curve and hysteresis loop: Energy dissipation, Hysteresis loss and importance of Hysteresis Curve
18 Aug – 18 Sept	Magnetic Field: Biot-Savart's Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Ampere's Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field. Numerical problems followed by test
19 sept - 13 Oct	Electric field: Conservative nature of Electrostatic Field. Electrostatic Potential. Derivation of electric field E from potential as gradient. Laplace's and Poisson equations. The Uniqueness Theorem. Gauss's Law, Differential form of Gauss's law and applications of Gauss's law. Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and Mechanical force on a conductor. Energy per unit volume. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Methods of images and its-application to simple electrostatic problems, plane infinite sheet and sphere. Numericals followed by test
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	DC current Circuits: Electric current and current density, Electrical conductivity and Ohm's law (Review), Kirchhoff's laws for D.C. networks, Network theorems: Thevenin's theorem, Norton theorem, superposition theorem. Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits. Growth and decay of current in a circuit with (a) Capacitance and resistance (b) resistance and inductance (c) Capacitance and inductance (d) Capacitance resistance and inductance. Alternating Current Circuits: A resonance circuit, Phasor, Complex Reactance and Impedance, Analysis for RL, RC and LC Circuits, Series LCR Circuit: (1) Resonance, (2) Power Dissipation (3) Quality Factor and (4) Band Width, Parallel LCR Circuit. Numerical problems and revision.

Name: : Mrs. NEELAM
Class: Physics Hons(5th Sem)
Paper code: PHY 504
Subject Name: *Physics of Materials-I*
Number of Days – Monday- Tuesday

28July- 15 Aug	Amorphous and crystalline materials. Lattice translation vectors. Lattice with a basis-central and non-central elements. Unit cell, reciprocal lattice. Types of lattices. Crystal diffraction : Bragg's law, diffraction of X-rays,
18 Aug – 18 Sept	Atoms and geometrical structure factor. X-ray diffraction methods – measurement of lattice parameter for cubic lattices. Lattice vibrations. Linear monoatomic and diatomic chains. Acoustical and optical phonons. Qualitative description of the phonon spectrum in solid Brillouin zones Numerical problems followed by test
19 sept - 13 Oct	Debye theories of specific heat of solids T3 law. Magnetic Properties of Matter, Response of substances of magnetic field Dia, para and ferri and ferromagnetic materials. Classical Langevin theory of dia and paramagnetic domains. Numerical problems
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	Quantum mechanical treatment of paramagnetism. Curle's law, Weiss's theory of ferromagnetism and ferromagnetic domains and discussionof B.H hysteresis. Qualitative discussion of ferrimagnets and ferrites Revision followed by test

Name: Dr. Manju Vashistha
Class: B.Sc I(NM) Ist Sem, Sec A, Sec B
Paper code: 24PHY401DS01
Subject Name: Mechanics
Number of days: 3,4

15 july- 15 Aug	**Introduction of complete syllabus** **Unit I** introduction, mechanics of a single particle, conservation law of linear and angular momentum, Conservation law of energy for single particle, system of particle, centre of mass and equation of mtion, Conservation law of linear and angular momentum of system of particles Test and assignment of unit I
18 Aug – 18 Sept	**Introduction to unit II**, Generalised coordinates, velocity, acceleration, momentum, force and potential energy in terms of generalised coordinates Hamilton's variational principle, Lagrange's equation of motion from Hamilton's principle, Linear harmonic oscillator, simple pendulum, Atwood's machine, Numerical related problems Test and assignment of unit II Introduction to unit III rotational motion, moment of inertia, Torque, angular momentum, kinetic energy of rotaion, Theorems of perpendicular and parallel axes with proof, Numerical problem and test of completed unit Moment of inertia of solid sphere, hollow sphere,
19 sept - 13 Oct	Moment of inertia of spherical shell and solid cylinder, Moment of inertia of hollow cylinder and solid bar of rectangular cross-section, Acceleration of a body rolling down an inclined plane,Numerical problems and doubt class Test and assignment of unit III **Introduction to Unit IV**, Relativity theory, reference systems, uniformly rotating frame, laws of Physics in rotating coordinate system, centrifugal force, coriolis force and its applications , Inertial frames, Michelson-Morley experiment: search for ether, postulates of special theory of relativity, Lorentz transformations
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	Length contraction, time dilation, velocity addition theorem, Variation of mass with velocity and mass energy equivalence, relativistic Doppler effect, relativistic kinematics, transformation of energy and momentum.

Name: Dr. Manju Vashistha
Class: B.Sc I(NM) Ist Sem
Paper code: 24PHY401SE01
Subject Name: Electrical circuit & Instrumentation skills
Number of days: 5,6

15 july- 15 Aug	**Introduction to Syllabus.** **Introduction to Unit 1**, Basic electricity Principles: Voltage, Current, Resistance and Power, Ohm's Law, series and parallel combination, AC Electricity and DC Electricity, Familiarization with multimeter, voltmeter and ammeter, Multimeter: Principles of measurement of DC voltage and DC current, AC voltage, AC current and Resistance, Specification of a Multimeter and their significance. Electronic voltmeter: Principles of voltage, measurement (block diagram only), Specification of an electronic voltmeter/ multimeter and their significance , AC milli-voltmeter: type of AC millivoltmeter: Amplifier-Rectifier and Rectifier-Amplifier, block diagram of AC millivoltmeter, specification and their significance.
18 Aug – 18 Sept	**Introduction to Unit II**, Block diagram of basic CRO, construction of CRT, Electron gun, electrostatic focusing and acceleration, brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization, front panel controls. Specification of a CRO and their significance. Use of CRO for the measurement of voltage, dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes, Digital storage Oscilloscope: Block diagram and principle of workimg.
19 sept - 13 Oct	**Introduction to Unit III**, Digital instruments: Principle and working of digital meters, comparison of analog & digital instruments, characteristics of a digitalmeter. Working principles of digital voltmeter, digital multimeter: Block diagram and working of a digital multimeter. Working principle of time interval, frequencyand period measurement using universal counter/ frequency counter, time-base stability, accuracy and resolution.
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	**Introduction to Unit IV**, Solid state devices; resistors, inductors and capacitors, diode and rectifiers, components inseries and in shunt, responseof inductor and capacitors with DC and AC sources generators and Transformers: DC power sources, AC/DC generators, inductance, capacitance and impedance, operation of transformers, electric motors: single-phase, three phase & DC motors , basic design, interfacing DC or AC sources to control heaters & motors, speed &power of an ac motor

Name: Dr. Manju Vashistha
Class: B.Sc I(Single Major) Ist Sem
Paper code: Phy-24PHYS401DS01
Subject Name: Mechanics
Number of days: 1,2

15 july- 15 Aug	**Introduction of complete syllabus** **Unit I introduction**, mechanics of a single particle, conservation law of linear and angular momentum, Conservation law of energy for single particle, system of particle, centre of mass and equation of mtion, Conservation law of linear and angular momentum of system of particles Test and assignment of unit I
18 Aug – 18 Sept	**Introduction to unit II**, Generalised coordinates, velocity, acceleration, momentum, force and potential energy in terms of generalised coordinates Hamilton's variational principle, Lagrange's equation of motion from Hamilton's principle, Linear harmonic oscillator, simple pendulum, Atwood's machine, Numerical related problems Test and assignment of unit II Introduction to unit III rotational motion, moment of inertia, Torque, angular momentum, kinetic energy of rotaion, Theorems of perpendicular and parallel axes with proof, Numerical problem and test of completed unit Moment of inertia of solid sphere, hollow sphere,
19 sept - 13 Oct	Moment of inertia of spherical shell and solid cylinder, Moment of inertia of hollow cylinder and solid bar of rectangular cross-section, Acceleration of a body rolling down an inclined plane,Numerical problems and doubt class Test and assignment of unit III **Introduction to Unit IV**, Relativity theory, reference systems, uniformly rotating frame, laws of Physics in rotating coordinate system, centrifugal force, coriolis force and its applications , Inertial frames, Michelson-Morley experiment: search for ether, postulates of special theory of relativity, Lorentz transformations
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	Length contraction, time dilation, velocity addition theorem, Variation of mass with velocity and mass energy equivalence, relativistic Doppler effect, relativistic kinematics, transformation of energy and momentum.

Name: VIKAS
Class: M.Sc Ist Semester
Paper code: 24PHY201DS04
Subject Name: Physics of Electronic Devices
Number of days: 1-2 &5-6

28 july – 28 Aug	Charge carriers in semiconductors: Energy bands, metals, Semiconductors and insulators, Direct and indirect band gap semiconductors, Variation of energy bands with alloy composition, Electrons and holes, effective mass, Intrinsic and extrinsic semiconductors, Concept of Fermi level, Electron and hole concentration at equilibrium, Temperature dependence of carrier concentrations, Compensation and space charge neutrality, Conductivity and mobility, Effect of temperature and doping on mobility, Hall effect, Invariance of Fermi level
29 Aug – 29 Sept	Carrier transport in semiconductors: Optical absorption and luminescence, Carrier lifetime and photoconductivity, Direct/indirect recombination of electrons and holes, Traps and defects, Steady state carrier generation, Quasi Fermi levels, Diffusion and drift of carriers, Diffusion and recombination, Diffusion length, Haynes Shockley experiment, Gradient in quasi Fermi level, External and internal photoelectric effect
30 Sept – 13 Oct	Diode physics and optoelectronic devices: P-N junction diode: Basic structure, Energy band diagram, Built-in potential, Electric field, Space charge width and qualitative description of current flow, Derivation of diode current equation, Zener diode: breakdown mechanisms, Voltage regulator circuit, Power diode, Varactor diode, Optoelectronic devices: Vacuum photodiode, Photo-multipliers tube, P-N junction photodiode, Pin photodiode, Avalanche photodiode, Phototransistor, Solar cell, Light emitting diode (LED), Diode laser: Condition for laser action and optical gain
14 Oct – 22 Oct	***Diwali Vacation***
23Oct – 18 Nov	Transistors: Bipolar junction transistor (BJT),Transistor operating modes, Transistor action, Transistor biasing configurations and characteristics, Field effect transistors: Junction field effect transistor (JFET), Metal oxide semiconductor field effect transistor (MOSFET), Negative resistance devices: Tunnel diode, Backward diode, Uni-junction transistor, p-n-p-n devices and their characteristics, Silicon controlled rectifier and switch and their characteristics. (**Revision)** ***(Test)***

Name: Vikas
Class: B.Sc.5th Sem (Hons.)
Paper code: PHY-505
Subject Name: Electronics Devices
Class working days: (3-4)

28 July – 28Aug	Basic semiconductor physics ,p and n type semiconductors Energy level diagram, conductivity and mobility, p-n junction fabrication (simple idea). Barrier formation in p-n junction diode, current flow mechanism in forward and reverse biased diode. Single p-n junction devices (physical explanation, current voltage characteristics)
29 Aug – 29 Sept	One or two applications and Two terminal devices-rectifier diode, Zener diode, photo diode, LED, solar cell and varactor diode. Two junction devices p-n-p and n-p-n transistors, physical mechanism of current flow, active, cutoff and saturation regions.
30 Sept – 13Oct	Transistor in active region and equivalent circuit. Three terminal devices junction field effect transistor (FET) unijunction transistor (UJT) and their equivalent circuits
14 Oct - 22 Oct	***Diwali Vacation***
23Oct – 18 Nov	Mesh analysis for d.c. and a.c. Nodal analysis duallty in networks. To Equivalent of a four terminal network. Thevenin and Norton theorem with Circuit diagram. Maximum power transfer superposition and reciprocity theorems. Z, Y, H parameters

Name: Ms. Anju Rani
Class: M.Sc. (Physics) Semester-I
Paper code: 24PHY201DS03
Subject Name: Quantum Mechanics – I
Number of Days: 1-2, 5-6

15 July- 15 Aug	General formalism of Quantum Mechanics: States and operators; Representation of States and dynamical variables; Linear vector space; Bra Ket notation, Linear operators; Orthonormal set of vectors, Completeness relation; Hermitian operators, their eigenvalues, and eigenvectors, The fundamental commutation relation; Commutation rule and the uncertainty relation; Simultaneous eigenstates of commuting operators; The unitary transformation. Numerical Problems and Doubts.
18 Aug – 18 Sept	Dirac delta function; Relation between kets and wave functions; Matrix representation of operators; Solution of linear harmonic oscillator problem by operator methods. Angular momentum operator: Angular momentum operators and their representation in spherical polar co-ordinates; Eigenvalues and eigenvectors of L2 , spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation; Pauli spin matrices; Addition of angular momentum . Test
19 sept - 13 Oct	Solution of Schrodinger equation for three dimensional problems: The three-dimensional harmonic oscillator in both Cartesian and spherical polar coordinates, Eigen values, Eigen functions and the degeneracy of the states; Solution of the hydrogen atom problem, the eigenvalues, Eigen functions and the degeneracy. Assignment
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	Perturbation Theory : Time independent perturbation theory; Non degenerate case, the energies and wave functions in first order the energy in second order; Anharmonic xλperturbations of the form 3 xλand 4 ; Degenerate perturbation theory; Stark effect of the first excited state of hydrogen. Revision and Test

Name: Ms. Anju Rani
Class: M.Sc. (Physics) Semester-V
Paper code: 24PHY201DS03
Subject Name: Quantum Mechanics – I
Number of Days: 1-4

28 July- 28 Aug	Crystalline and gallssy forms, liquid crystals. Crystal structure, periodicity, lattice and basis, crystal translational vectors and axes. Unit cell and primitive cell, Winger Seitz primitive Cell, symmetry operations for a two dimensional crystal.
29 Aug – 29 Sept	Bravais lattices in two and three dimensions. crystal planes and Miller indices, Interplanner spacing, Crystal structures of Zinc sulphide. Crystal structures of Sodium Chloride and diamond. Numerical Problems. Test of unit -1.
30 Sept - 13 Oct	X-ray diffraction, Bragg's Law and experimental x-ray diffraction methods, K-space. Reciprocal lattice and its physical significance, reciprocal lattice vectors, reciprocal lattice to a simple cubic lattice, b.c.c and f.c.c.
14 Oct – 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	Specific heat: Specific heat of solids, Einstein's theory of specific heat, Debye model of specific heat of solids. Numerical Problems and doubts. Test and Assignments.

Name : Sonu
Class : M.Sc
Paper code : 25PHY203DS02
Subject Name : Electrodynamics and Wave propagation
Number of days : (3-6)

28 July – 31Aug	Review of four, vector and Lorentz transformation in four, dimensional space; Conservation of charge and four current density; Electromagnetic field tensor in four dimensions and Maxwell's equations; Lorentz invariants of electromagnetic fields; Dual field tensor; Transformation of electric and magnetic field vectors; Covariance of force equation.
1 Sept – 13 Oct	Radiating systems: Field and radiation of a localized source; Oscillating electric dipole; Centre fed linear antenna; Lienard, Wiechert potential; Electric and magnetic fields due to a uniformly moving charge and accelerated charge; Linear and circular acceleration and angular distribution of power radiated.
14 Oct - 22 Oct	***Diwali Vacation***
23 Oct – 18 Nov	Radiative reaction force; Scattering and absorption of radiation; Thompson scattering and Rayleigh scattering; Normal and anomalous dispersion; Ionosphere; Propagation of electromagnetic wave through ionosphere; Reflection of electromagnetic waves by ionosphere; Motion of charged particles in uniform E and B fields; Time varying fields.
19Nov– 30 Nov	Fields at the surface of and within a conductor; Wave guides; Modes in a rectangular waveguide; Attenuation in waveguides; Dielectric waveguides; Circuit representation of parallel plate transmission lines; Transmission line equations and their solutions; Characteristic impedance and propagation coefficient; Low loss radio frequency and UHF transmission lines. .

Name: Sonu
Class: B.Sc Physics (hons)
Paper code: Phy-501
Subject Name: Mathematical Physics
Number of days: (1-2)

8 Aug – 31 Aug	Introduction to groups, rings and fields. Vector spaces and subspaces. Linear independence basis and dimensions. Linear transformations.
1 Sept – 13 Oct	Algebra of linear transformations. Non-singular transformations. Isomorphism. Representation of linear transformations by matrices.
14 oct – 22 Oct	***Diwali Vacation***
23oct-18 Nov	Matrix algebra Addition and multiplication null and unit matrices. Singular and non singular matrices. Inverse of a matrix Eigenvalues and eigenvectors. Digitalization solution of coupled linear ordinary differential equations.
19Nov– 30 Nov	Special matrices: Hermitian and skew symmetric and antisymmetric, orthogonal and unitary matrices Similarly transformations and bilinear and quadratic forms. Trace of a matrix Cayley Hamilton theorem. Function of a matrix. Metric spaces. Inner product and metric concept.