Physics Lesson Plan 1st Semester (2025-26)

Class : B.Sc.I Life Sciences MIC &B.Com I MDC by Ms. Poonam Devi

B.A. I MDC by Mr. Sushil Kumar

Month	Topics To Be Covered	Topics To Be Covered
Paper	**Minor Course (MIC) Fundamental of Electronics- I Paper code: C24MIC133T. (2Hrs /week) Credits: 2**	**C24MDC123T Fundamental of Physics-I**
July	**Unit- I** Energy bands in solids: Charge particles, field intensity, potential, energy and its unit, nature of atom, atomic energy levels.	**UNIT-I** Fundamental of Physics: System of Measuring Units-Need for measurement, measuring process, concept of mass, length, time: Fundamental and derive units
August	electronic structure of the elements, energy band theory of crystals, Insulators, semiconductors, and metals Transport phenomena in semiconductors: mobility and conductivity, Intrinsic and extrinsic semiconductors	system of units, concepts of error, types of error (only definition), Accuracy and precision in measurement, least count and applications of measuring instruments - Vernier caliper, Screw Gauge, Scalar and Vector quantities
September	, charge density in a semiconductor, Electrical properties of Ge and Si, Hall effect, Generation and recombination of charges, Diffusion, and continuity equation.	**Unit- II** Laws of motion: Description of motion along a straight line- distance and displacement, uniform motion and nonuniform motion, average and instantaneous speed, average and instantaneous velocity, acceleration; graphical analysis of straight-line motion- distance- time graph, velocity-time graph, equation of motions and their applications
October	**Unit- II** p-n junction: open circuited p-n junction, current component of p-n diode, VI characteristics and its temperature dependence behavior, p-n junction as rectifier, space charge and transition capacitance, diffusion capacitance, Breakdown diodes Zener diode and its characteristics. Applications of diode: Diode as a rectifier, LED, Solar cell, tunnel diodes.	Causes of motion- concept of force, Newton's Ist law of motion, inertia, and mass: Newton's 2nd law of motion, momentum, and force: 3rd law of motion, daily life applications of Newton's laws of motion. Universal law of gravitation and its importance, acceleration due to gravity and free fall of a body mass and weight of an object on earth and moon, concept of thrust and pressure and importance in daily life.
November	Revision & tests	Revision & tests

Physics Lesson Plan Session 2025-26(Odd Sem)

Name of Extension Lecturer :Dr. Kavita
Class : B.Sc I Physical Science DSC
Subject:C24PHY101T/~~C24MIN133T~~ C24MIN133T
Mechanics (Semester I)

Class : B.Sc II Physical Science MIC
Subject:: C24MIC333T (i)
Electronics Instrumentation

Month	Topics Covered	Topics Covered
AUGUST	**Unit-I** **Fundamentals of Dynamics:** Rigid body, Moment of Inertia, Radius of Gyration, Theorems of perpendicular and parallel axis (with proof), Moment of Inertia of ring, Disc, Angular Disc, Solid cylinder, Solid sphere, Hollow sphere, Torque, Rotational Kinetic Energy, Angular momentum, Law of conservation of angular momentum, rolling motion, condition for pure rolling, acceleration of body rolling down an inclined plane, Fly wheel, Moment of Inertia of an irregular body.	**Unit-I** **Basics 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 multimeters and their significance.
SEPTEMBER	**Unit-II** **Elasticity:** Deforming force, Elastic limit, stress, strain and their types, Hooke's law, Modulus of rigidity, Relation between shear angle and angle of twist, elastic energy stored/volume in an elastic body, Elongation produced in heavy rod due to its own weight and elastic potential energy stored in it, Tension in rotating rod, Poisson's ratio and its limiting value, Elastic Constants, and their relations. Torque required for twisting cylinder, bending of beam, bending moment and its magnitude, determination of elastic constants for material of wire by Searle's method.	**Unit-II** **Digital Multimeter:** Block diagram and working of a digital multimeter, Working principle of time interval, frequency and period measurements using universal counter/ frequency counter, Time - base stability, Accuracy and resolution. **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
OCTOBER	**Unit-III** **Gravitation and central force motion:** Law of gravitation, Gravitational potential energy, Inertial and gravitational mass, Potential and field due to spherical shell and solid sphere, Motion of a particle under a central force field, Twobody problem and its reduction to one-body problem and its solution, Differential Equation of motion with central force and its solution, Concept of power Law Potentials, Kepler's Laws of Planetary motion.	**Unit-III** **Function Generators:** Overview of function generators, their purpose, types of waveforms produced, and triggering methods, Generation of waveforms and important features like frequency range and modulation capabilities, working principle of generator, conversion of triangular to square and sine waves, Frequency response, Advance function generators.
NOVEMBER	**Unit-IV** **Special Theory of Relativity:** Michelson's Morley experiment and its outcomes, Postulates of special theory of relativity, Lorentz Transformations, Simultaneity and order of events, Lorentz contraction, Time dilation, Relativistictransformation of velocity, relativistic addition of velocities, variation of mass-energy equivalence, relativistic Doppler effect, relativistic kinematics, transformation of energy and momentum, transformation of force	**Unit-IV** **Cathode Ray Oscilloscope:** Block diagram of basic CRO, Construction of CRT, Electron gun, electrostatic focusing and acceleration (qualitative treatment only), 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 and time period. Special features of dual trace, Introduction to digital oscilloscope and probes, Digital storage Oscilloscope: Block diagram and principle of working.

Kavita
12/9/25

Physics Lesson Plan Session 2025-26(Odd Sem)

Name of Extension Lecturer :Mr. Sushil Kumar
Class : B.A.& B.Com MDC II

Subject:C24MDC323T

: Introductory Modern Physics

Name of Extension Lecturer :Dr. Kavita
Class : B.Sc I SEC

Subject:C24SEC130T

Instrumentation-I (Semester I)

Month	Topics Covered	Topics Covered
AUGUST	**Unit-I** **Introduction to electromagnetic spectra:** -Electromagnetic radiations, radio waves, microwaves, Infrared radiations (IR),	**Unit-I** Error in measurement, Types of error, Ohm's law, Kirchhoff's current law, Kirchhoff's voltage law, Wheatstone bridge, Potentiometer, Measurement of emf of a cell using potentiometer, Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance.
SEPTEMBER	Visible light, Ultraviolet (UV) light-Rays, Gamma rays, range Applications of electromagnetic Radiations. Dispersion of light., Photoelectric effect, Einstein's explanation Compton scattering (Only Qualitative), Pair production and annihilation.	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)
OCTOBER	**Unit-II** **Atomic structure:** Rutherford scattering, Rutherford's model and its drawbacks, Bohr atomic model; quantization rule, atomic stability, calculation of energy levels for hydrogen atom and their spectra.	**Unit-II** **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.
NOVEMBER	**Wave properties of matter:** De-Broglie wavelength and matter waves; Wave-particle duality, wave packets, phase velocity, group velocity and their relations. Revision of Syllabus 12/9/25	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. Revision of Syllabus 12/9/25

Lesson Plan session 2025-2026

Name of Extension Lecturer : Dr. Monika
Class : B.Sc.-II (Physical Science) DSC
Subject: C24PHY301T:
Thermodynamics and Statistical Physics

Month	Topics Covered
JULY	UNIT-I Thermodynamics-I: Th rmodynamics systems, variables and equation of state, thermal equilibrium, Zeroth law of thermodynamics: Concept of heat, work and its sign(work done by the system on the sy stem). First law of thermodynamics- its significance and limitations
AUGUST	Different types of proc ss-isochoric process, isobaric process, adiabatic process, isothermal process, cyclic process. Reversible and irreversible process. First law and cyclic process; Second law of thermod namics and its significance. Carnot theorem; Absolute scale of temperature, Absolute Z ero, Joule's free expansion, Joule Thomson effect, Entropy, calculations of entropy of reversible and irreversible process, T-S diagram, entropy of a perfect gas, Nernst heat law (third law of thermodynamics).
SEPTEMBER	UNIT-II Thermodynamics-II: D rivation of Clausius-Clapeyron and Clausius latent heat equations and their significance, phase diagram and triple point of a substance, Thermodynamics functions: Internal energy (U), Helmholtz function (F), Enthalpy (H), Gibbs function (G) and the relations betwe n them, derivation of Maxwell thermodynamics relations from thermodynamics functions, Application of Maxwell relations: relations between two specific heats of gas. TEST:UNIT I & UNIT II
OCTOBER	UNIT-III Statistical Physics-I: Distribution of N (for N= 2, 3, 4) distinguishable and indistinguishable partic es in two boxes of equal size, microstates and microstate's, thermodynamically pro bability, constraints and accessible states, statistical fluctuations, general distribution of d istinguishable particles in compartments of different size, postulates of statistical mechanics
NOVEMBER	UNIT-IV Statistical Physics-II: C lassical statistics, basic approach to these statistics, Maxwell-Boltzmann statistics ap lied to an ideal gas in equilibrium-energy and speed distribution law, most probable spe d, average and r.m.s. speed.. Need of Quantum statistics- classical versus quantum statisti s, Bose-Einstein energy distribution Law, Fermi Dirac energy distribution Law.

Physics Lesson Plan Session 2025-26(Odd Sem)

Name of Extension Lecturer : Dr. Monika
Class : B.A.& B.Com MDC II
Subject: C24MDC323T(Introductory Modern Physics)

Class : B.Sc.-II (Physical Science) SEC
Subject: C24SEC330T (Numerical Techniques)

	Class- BA and B.Com II
Month	Topics Covered (MDC)
JULY	**Unit-I** Introduction to electromagnetic spectra: - Electromagnetic radiations, radio waves, microwaves, Infrared radiations (IR),
AUGUST	Visible light, Ultraviolet (UV) light-Rays, Gamma rays, range Applications of electromagnetic Radiations. Dispersion of light.
SEPTEMBER	, Photoelectric effect, Einstein's explanation Compton scattering (Only Qualitative), Pair production and annihilation TEST:
OCTOBER	**Unit-II** Atomic structure: Rutherford scattering, Rutherford's model and its drawbacks, Bohr atomic model; quantization rule, atomic stability, calculation of energy levels for hydrogen atom and their spectra.
NOVEMBER	Wave properties of matter: De-Broglie wavelength and matter waves; Wave-particle duality, wave packets, phase velocity, group velocity and their relations.

	Class – B.Sc. Physical Science
Month	Topics Covered (SEC)
JULY	**Unit-I** Introduction to Fortran: Computer architecture and organization, memory and input/output devices, Binary and decimal arithmetic, Fortran character set
AUGUST	Data types and integer constant, variables, Arithmetic expression, Assignment statement, Format statement, Read/write statement, Unformatted input/output statements,Algorithm,Flowcharts,FORTRAN statement & subprograms: GOTO, Computed GOTO
SEPTEMBER	Arithmetic If, logical If, If Then Else, Nested If Then Else, DO loops, Continue statement, nested do loop. Data statement, Double precision, Logical data, Complex data, While structure, Arrays and subscripted variables, Subprograms. TEST:
OCTOBER	**Unit-II** Solutions of algebraic equations: Bisection method,Iteration method,Newton-Raphson method, Muller's method, Quotient-Difference method, Secant Method.
NOVEMBER	Algorithm, flowchart and program: Finding the roots of a quadratic equations, motion of a projectile, summing a series of numbers, finding factorial of given number, motion in a central force field, addition and multiplication of two matrices, solution of algebraic equations using Bisection and Newton Raphson method.

Physics Lesson Plan 5th Semester (2025-26)

Class : B.Sc.III N.M. by Mr. Sushil Kumar &C.S

Class : B.Sc.III N.M. by Ms. Poonam Devi &C.S.

Month	Topics To Be Covered	Topics To Be Covered
Paper	CPL-501 Discipline Specific Course-I Elements of Modern Physics (Credits – 02, 30 Hrs (2 Hrs/week))	CPL-502 Discipline Specific Course-II Nuclear Physics (Credits – 02, 30 Hrs (2 Hrs/week))
July	**UNIT-I** Introduction to Quantisation: Properties of Thermal Radiation, Spectral Distribution of Blackbody Radiation, Kirchhoff's Law, Stefan-Boltzmann Law and Wien's Distribution and Displacement law, Rayleigh-Jean's Law, Ultraviolet Catastrophe,	**UNIT-I** Basic Properties of Nuclei: Nuclear composition (p-e and p-n hypotheses), Nuclear properties; Nuclear mass, size, spin, parity, magnetic dipole moment,
August	**Unit- II** Planck's Quantum Postulates, Planck's Law of Blackbody Radiation: Experimental Verification. Photo-electric effect and Compton scattering; Pair production and annihilation, Bremsstrahlung effect, Cherenkov radiation, Production of X-rays.	quadruple moment (shape concept) and binding energy, nuclear binding energy curve. Radioactivity: Law of Radioactive Decay, Half-life, Radioactive Series, α-decay: Range of α-particles, GeigerNuttal law and α-particle Spectra, β-decay, Energy Spectra and Neutrino Hypothesis, γ-decay : Origin of γ-rays.
September	Bohr Model: Drawbacks of Rutherford model, Bohr atomic model; Bohr's quantization rule and atomic stability; Calculation of energy levels for hydrogen like atoms and their spectra, Effect of nuclear mass on spectra, Correspondence principle. Fundamentals of Wave Mechanics: De Broglie wavelength and matter waves; Wave-particle duality; Frank-Hertz, Davison and Germer experiment, phase velocity, group velocity and their relations.	**Unit- II** Nuclear Models and Nuclear Forces: Similarity between nuclear matter and liquid drop, Liquid Drop Model, Semi-classical Mass formula, Limitations of liquid drop model, Magic number, Experimental signature of shell structure in nuclei, Nuclear Shell Model (qualitative only) and its application, Meson Theory of Nuclear Forces. **UNIT-III** Radiation Interaction: Interaction of heavy charged particles (proton, Alpha particles etc.);
October	**UNIT-III** Heisenberg Uncertainty Principle; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle, Properties of wave-function, Physical Interpretation of wave-function. Schrodinger Equation: Momentum and Energy operators, Stationary states, Physical interpretation of a wave function, probabilities and normalization, Schrodinger Equation, Particle in1-dimention infinite potential well.	Energy loss of heavy charged particle (Discussion of Bethe formula), Range of alpha particles. Interaction of light charged particle (Betaparticle), Interaction of Gamma Ray; Passage of Gamma radiations through matter (Photoelectric, Compton and pair production effect), Absorption of Gamma rays (Mass attenuation coefficient), Nuclear Reactions: Types of nuclear reactions, Concept of reaction cross-section, Concept of Compound and Direct Reactions
November	**Unit – IV** LASER: Absorption and emission of radiation (qualitative only); Basic features of LASER, Population inversion, Resonance cavity; laser pumping; threshold condition for laser emission; Einstein's Co-efficient, 3 level and 4 level system, Basic principle and working of He-Ne LASER and Ruby LASER, Applications of LASER. Revision & Tests.	**UNIT-IV** Nuclear Radiation Detectors: Gas filled counters; Ionization chamber, proportional counter, G.M. Counter (detailed study), Basic principle of scintillation counter and semiconductor detectors Nuclear Reactors: General aspects of reactor design, Nuclear fission reactor (Principle, construction, working and use) Particle Accelerators: Particle Accelerator facilities in India, Linear Accelerator, Cyclotron, Synchrotron. Revision & Tests

Poonam