


"PVC" NSSK Govt. Polytechnic Bilaspur at Kalol

Lesson Planning (Theory)

Branch:	EE Engineering	Semester:	Second
Subject:	App. Physics II	Session:	27 Jan 2025 to 29 May 2025
Teacher:	Vinay Kr. Guleira	Laboratory:	Physics Lab

Sr. No	No. of Lectures	Chapter/unit Discription	Detail of Contents
1	12	UNIT - 1: Wave motion and its applications	Wave motion, transverse and longitudinal waves with examples, definitions of wave velocity, frequency and wave length and their relationship, Sound and light waves and their properties, wave equation ($y = r \sin \omega t$) amplitude, phase, phase difference, Principle of superposition of waves and beat formation. Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency etc. Free, forced and resonant vibrations and their examples. Acoustics of buildings – reverberation, reverberation time, echo, noise, coefficient of absorption of sound, methods to control reverberation time and their applications. Ultrasonic waves – Introduction and properties, engineering and medical applications of ultrasonic.
2	9	UNIT - 2: Optics	Basic optical laws- reflection and refraction, refractive index, Images and image formation by mirrors, lens and thin lenses, lens formula, power of lens, magnification. Total internal reflection, Critical angle and conditions for total internal reflection, applications of total internal reflection in optical fiber. Optical Instruments- simple and compound microscope, astronomical telescope in normal adjustment and their magnifying powers.
3	6	UNIT - 3: Electrostatics	Coulomb's law, unit of charge. Electric field, Electric lines of force and their properties. Electric flux, Electric potential and potential difference, Gauss's law. Capacitor and its working, Capacitance and its units. Capacitance of a parallel plate capacitor, Series and parallel combination of capacitors (related numerical), dielectric and its effect on capacitance, dielectric break down.
4	6	UNIT - 4: Current Electricity	Electric Current and its units, Direct and alternating current. Resistance and its units, Specific resistance, Conductance, Specific conductance, Series and parallel combination of resistances. Factors affecting resistance of a wire, carbon resistances and colour coding. Ohm's law and its verification, Kirchhoff's laws. Concept of terminal potential difference and Electro motive force (EMF) Heating effect of current, Electric power, Electric energy and its units (related numerical problems), Advantages of Electric Energy over other forms of energy.
5	7	UNIT - 5: Electromagnetism	Types of magnetic materials: dia, para and ferromagnetic with their properties. Magnetic field and its units, magnetic intensity, magnetic lines of force, magnetic flux and units, magnetization. Lorentz force (force on moving charge in magnetic field), Force on current carrying conductor. Moving coil galvanometer; principle, construction and working, Conversion of a galvanometer into ammeter and voltmeter.
6	6	UNIT - 6: Semiconductor Physics	Energy bands in solids, Types of materials (insulator, semi-conductor, conductor), intrinsic and extrinsic semiconductors. p-n junction, junction diode and V-I characteristics. Diode as rectifier – half wave and full wave rectifier (centre taped). Photocells, Solar cells; working principle and engineering applications.
7	10	UNIT - 7: Modern Physics	Lasers: Energy levels, ionization and excitation potentials; spontaneous and stimulated emission; population inversion, pumping methods, optical feedback. Types of lasers; Ruby, He-Ne and semiconductor, laser characteristics, engineering and medical applications of lasers. Fiber Optics: Introduction to optical fibers, light propagation, acceptance angle and numerical aperture, fiber types, applications in; telecommunication, medical and sensors.
Recommeded Books			(i) Text book of Physics, N.C.E.R.T., App.Physics I By RA Banwat, Conepts of Physics By HC Verma Vol I and Vol II (ii) Text Book of Physics for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi. (iii) e-books/e-tools/ learning physics software/websites etc.


Signature of teacher


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