

## LESSON PLAN (APPLIED PHYSICS-II)


Discipline : Math & Sc		Semester: 2 <sup>ND</sup> Sem(S-2025)	Name of the Teaching Faculty: Sipra Subhadarshini Jena, Lect Stage II Physics	
Subject: TH 2A		No. of Days/ Per week class allotted: 04	Semester From date: 04.02.2025	To Date: 17.05.2025
MONTH	Week	Day	Topics	
FEBRUARY	2ND	2	UNIT-1: Wave motion, transverse and longitudinal waves with examples, definitions of wave velocity, frequency and wave length and their relationship.	
		3	Sound and light waves and their properties, wave equation ( $y = r \sin t$ ) amplitude, phase, phase difference	
		5	Principle of superposition of waves and beat formation	
	3RD	1	Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency etc	
		2	Simple harmonic progressive wave and energy transfer, study of vibration of cantilever and determination of its time period, Free, forced and resonant vibrations with examples.	
		3	Acoustics of buildings—reverberation, reverberation time, echo, noise, coefficient of absorption of sound, methods to control reverberation time and their applications	
		5	Ultrasonic waves—Introduction and properties, engineering and medical applications of ultrasonic.	
	4TH	1	UNIT-2: Basic optical laws; reflection and refraction, refractive index, Images and image formation by mirrors, lens and thin lenses, lens formula, power of lens, magnification and defects.	
	5TH	2	Total internal reflection, Critical angle and conditions for total internal reflection, applications of total internal reflection in optical fiber.	
		3	Optical Instruments; simple and compound microscope, astronomical telescope in normal adjustment, magnifying power, resolving power, uses of microscope and telescope, optical projection systems.	
		5	REVISION	
		1	CLASSTEST	
		2	UNIT-3: Coulombs law, unit of charge, Electric field, Electric lines of force and their properties, Electric flux, Electric potential and potential difference	
		5	Gauss law: Application of Gauss law to find electric field intensity of straight charged conductor, plane charged sheet and charged sphere.	
MARCH		1	Capacitor and its working, Types of capacitors, Capacitance and its units. Capacitance of a parallel plate capacitor, Series and parallel combination of capacitors	

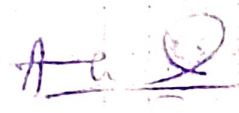
	2ND	2	Series and parallel combination of capacitors (related numerical), dielectric and its effect on capacitance, dielectric break down.
		5	UNIT-4: Electric Current and its units, Direct and alternating current, Resistance and its units, Specific resistance
	3RD	1	Conductance, Specific conductance, Series and parallel combination of resistances. Factors affecting resistance of a wire, carbon resistances and colour coding.
		2	Ohm's law and its verification, Kirchhoff's laws, Wheatstone bridge and its applications (slide wire bridge only), Concept of terminal potential difference and Electromotive force (EMF)
		3	Heating effect of current, Electric power, Electric energy and its units (related numerical problems), Advantages of Electric Energy over other forms of energy.
	4TH	1	REVISION
		2	CLASSTEST

APRIL	5TH	1	UNIT-5: 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
		2	Concept of electromagnetic induction, Faraday's Laws, Lorentz force (force on moving charge in magnetic field). Force on current carrying conductor, force on Rectangular coil placed in magnetic field.
		3	Moving coil galvanometer; principle, construction and working, Conversion of a galvanometer into ammeter and voltmeter.
		5	UNIT-6: Energy bands in solids, Types of materials (insulator, semi-conductor, conductor), intrinsic and extrinsic semiconductors
	1ST	3	p-n junction, junction diode and V-I characteristics, types of junction diodes. Diode as rectifier – half wave and full wave rectifier (centre tapped).
		5	Transistor; description and three terminals, Types - pnp and npn, some electronic applications (list only).
	2ND	1	Photocells, Solar cells; working principle and engineering applications.
		2	REVISION
		3	CLASSTEST
		5	UNIT-7: Lasers: Energy levels, ionization and excitation potentials; spontaneous and stimulated emission
	3RD	2	Population inversion, pumping methods, optical feedback,
		3	Types of lasers; Ruby, He-Ne and semiconductor, laser characteristics, engineering and medical applications of lasers.
	4TH	1	Fiber Optics: Introduction to optical fibers, light propagation, acceptance angle and numerical aperture,
		2	Fiber types, applications in; tele-communication, medical and sensors.
		3	Nano-science and Nano-technology: Introduction, nanoparticles and nanomaterials, properties at nanoscale, nanotechnology
		5	Nanotechnology based devices and applications



MAY	5TH	1	REVISION
		2	CLASSTEST
		3	REVISION
	1ST	5	REVISION
	2ND	1	REVISION
		2	REVISION
		3	REVISION
		5	CLASSTEST
	3RD	2	CLASSTEST
		3	CLASSTEST
		5	CLASSTEST

  
 Signature of the faculty

  
 Principal  
 Govt. Polytechnic Dhenkanal