

PNS SCHOOL OF ENGINEERING & TECHNOLOGY, MARSHAGHAI
DEPARTMENT OF SCIENCE AND HUMANITIES
LESSON PLAN OF APPLIED PHYSICS –II (TH 2)

BRANCH : MECHANICAL DISCIPLINE : SEMESTER: 2ND SUBJECT: APPLIED PHYSICS II NO.OF DAYS/WEEK CLASS ALLOTTED: 05		NAME OF THE TEACHING FACULTY: MR KSHITISH KUMAR SINGH		
		SEMESTER FROM DATE: 04/02/2025 TO DATE: 17 /05 /2025 NO OF WEEKS: 15		
WEEK	UNIT	CLASS DAY	THEORY TOPICS	
1st	UNIT - 1: Wave motion and its applications	1	Wave motion, transverse and longitudinal waves with examples, definitions of wave velocity, frequency and wave length and their relationship	
		2	Sound and light waves and their properties, wave equation ($y = r \sin t$) amplitude, phase, phase difference	
		3	principle of superposition of waves and beat formation	
		4	Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency etc.	
		5	Simple harmonic progressive wave and energy transfer	
2nd		6	study of vibration of cantilever and determination of its time period	
		7	Free, forced and resonant vibrations with examples	
		8	Acoustics of buildings – reverberation, reverberation time, echo, noise	
		9	coefficient of absorption of sound, methods to control reverberation time and their applications	
		10	Ultrasonic waves – Introduction and properties, engineering and medical applications of ultrasonic	
3rd	UNIT - 2: Optics	11	Basic optical laws; reflection and refraction	
		12	refractive index, Images and image formation by mirrors	
		13	lens and thin lenses, lens formula, power of lens	
		14	magnification and defects. Total internal reflection	
		15	Critical angle and conditions for total internal reflection, applications of total internal reflection in optical fiber	
4th		16	simple microscope in normal adjustment, magnifying power, resolving power, uses, optical projection systems.	
		17	Compound microscope in normal adjustment, magnifying power, resolving power, uses, optical projection systems.	
		18	Astronomical telescope in normal adjustment, magnifying power, resolving power, uses, optical projection systems.	
5th		UNIT - 3: Electrostatics	19	Coulombs law, unit of charge,
			20	Electric field, Electric lines of force and their properties
	21		, Electric flux, Electric potential and potential difference	
	22		Gauss law: Application of Gauss law to find electric field intensity of straight charged conductor	
	23		, plane charged sheet and charged sphere	
	24		Capacitor and its working, Types of capacitors, Capacitance and its units	
	25		Capacitance of a parallel plate capacitor, Series and parallel combination of capacitors (related numerical)	
	26		dielectric and its effect on capacitance, dielectric break down	

6th	UNIT - 4: Current Electricity	27	Electric Current and its units, Direct and alternating current	
		28	Resistance and its units, Specific resistance, Conductance, Specific conductance	
		29	Series and parallel combination of resistances	
		30	Factors affecting resistance of a wire, carbon resistances and colour coding	
7th		31	Ohm's law and its verification, Kirchhoff's laws	
		32	Wheatstone bridge and its applications (slide wire bridge only)	
		33	Concept of terminal potential difference and Electromotive force (EMF)	
		34	Heating effect of current, Electric power	
		35	Electric energy and its units (related numerical problems)	
8th		UNIT - 5: Electromagnetism	36	Advantages of Electric Energy over other forms of energy
	37		Types of magnetic materials; dia, para and ferromagnetic with their properties	
	38		Magnetic field and its units, magnetic intensity	
	39		magnetic lines of force, magnetic flux and units	
40	magnetization. Concept of electromagnetic induction, Faraday's Laws			
9th	41		Lorentz force (force on moving charge in magnetic field). Force on current carrying conductor, force on rectangular coil placed in magnetic field.	
	42		Moving coil galvanometer; principle, construction and working, Conversion of a galvanometer into ammeter and voltmeter	
	43		Moving coil galvanometer; principle, construction and working, Conversion of a galvanometer into ammeter and voltmeter	
10th	UNIT - 6: Semiconductor Physics		44	Energy bands in solids
			45	Types of materials (insulator, semi-conductor, conductor)
		46	, intrinsic and extrinsic semiconductors, p-n junction	
		47	junction diode and V-I characteristics, types of junction diodes	
		48	Diode as rectifier – half wave and full wave rectifier (centre taped)	
		49	Transistor; description and three terminals, Types- pnp and npn, some electronic applications (list only)	
		50	Photocells, Solar cells; working principle and engineering applications	
11th	UNIT - 7: Modern Physics	51	Lasers: Energy levels, ionization and excitation potentials	
		52	spontaneous and stimulated emission; population inversion, pumping methods, optical feedback	
		53	Types of lasers; Ruby, HeNe and semiconductor	
		54	laser characteristics, engineering and medical applications of lasers	
		55	Fiber Optics: Introduction to optical fibers, light propagation	
12th		56	acceptance angle and numerical aperture, fiber types	
		57	applications in; telecommunication, medical and sensors	
		58	Nanoscience and Nanotechnology: Introduction, nanoparticles	
		59	nanomaterials, properties at nanoscale, nanotechnology	
		60	nanotechnology based devices and applications	

S. Sunakar Singh. Singh.

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Kshitish Kumar Singh.

Signature of the Teacher

