LESSON PLAN FOR APPLIED PHYSICS-II (Th-2)

Discipline: All Branches	Semester: 2nd Sem (2024 A.B)		Name of teaching faculty: Ms. Sushree Sangita Satapathy & Mr. Jyotiranjan Dash
Subject: Applied Physics-II	No. of days/ Per week class allotted: 4		Date of commencement: 04/02/2025 To: 17/05/2025
Week	Class day	Unit	Theory topics
1	1	1	Wave motion, transverse and longitudinal waves with examples
	2		Definitions of wave velocity, frequency and wave length and their relationship
	3		Sound and light waves and their properties, wave equation ($y = r \sin wt$)
	4		Amplitude, Phase, Phase difference, Principle of superposition of waves and beat formation
2	1		Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency etc
	2		Simple harmonic progressive wave and energy transfer
	3		Study of vibration of cantilever and determination of its time period
	4		Free, forced and resonant vibrations with examples
3	1		Acoustics of buildings – reverberation, reverberation time, echo, noise
	2		Coefficient of absorption of sound, methods to control reverberation time and their applications
	3		Ultrasonic waves – Introduction and properties, engineering and medical applications of ultrasonic
	4	2	Basic optical laws; reflection and refraction, refractive index
4	1		Images and image formation by mirrors, lens and thin lenses
	2		Lens formula, power of lens, magnification and defects
	3		Total internal reflection, Critical angle and conditions for total internal reflection
	4		Applications of total internal reflection in optical fiber
5	1		Optical Instruments: simple and compound microscope, Astronomical telescope in normal adjustment
	2		magnifying power, resolving power, Uses of microscope and telescope, optical projection systems
	3	3	Coulombs law, unit of charge, Electric field, Electric lines of force and their properties
	4		Electric flux, Electric potential and potential difference
6	1		Gauss law: Application of Gauss law to find electric field intensity of straight charged conductor
	2		Application of Gauss law to find electric field intensity of plane charged sheet and charged sphere
			Capacitor and its working, Types of capacitors, Capacitance and its units,

	3		Capacitance of a parallel plate capacitor
	4		Series and parallel combination of capacitors (related numerical)
7	1		dielectric and its effect on capacitance, dielectric break down
	2		Electric Current and its units, Direct and alternating current
	3		Resistance and its units, Specific resistance, Conductance, Specific conductance
	4		Series and parallel combination of resistances
8	1	4	Factors affecting resistance of a wire, carbon resistances and colour coding
	2		Ohm's law and its verification, Kirchhoff's laws
	3		Wheatstone bridge and its applications (slide wire bridge only), Concept of terminal potential difference and Electromotive force (EMF)
	4		Heating effect of current, Electric power, Electric energy and its units
9	1		Related numerical problems, Advantages of Electric Energy over other forms of energy.
	2		Types of magnetic materials; dia, para and ferromagnetic with their properties
	3		Magnetic field and its units, magnetic intensity, magnetic lines of force, magnetic flux and units, magnetization
	4	5	Concept of electromagnetic induction, Faraday's Laws, Lorentz force (force on moving charge in magnetic field)
10	1		Force on current carrying conductor, force on rectangular coil placed in magnetic field
	2		Moving coil galvanometer; principle, construction and working
	3		Conversion of a galvanometer into ammeter and voltmeter
	4		Energy bands in solids, Types of materials (insulator, semi-conductor, conductor)
11	1		Intrinsic and extrinsic semiconductors, p-n junction,
	2	6	Junction diode and V-I characteristics, types of junction diodes
	3		Diode as rectifier – half wave and full wave rectifier (centre taped)
	4		Transistor; description and three terminals, Types- pnp and npn, some electronic applications (list only)
12	1		Photocells, Solar cells; working principle and engineering applications
	2		Lasers: Energy levels, ionization and excitation potentials; spontaneous and stimulated emission
	3		Population inversion, pumping methods, optical feedback
	4	7	Types of lasers; Ruby, He-Ne and semiconductor
13	1		Laser characteristics, engineering and medical applications of lasers
	2		Fiber Optics: Introduction to optical fibers, light propagation, acceptance angle and numerical aperture
	3		Fiber types, applications in; telecommunication, medical and sensors
			Nanoscience and Nanotechnology: Introduction, nanoparticles and

	4		nanomaterials, properties at nanoscale	
	1		nanotechnology, nanotechnology based devices and applications	
14	2		Revision of Chapter-1:	
	3		Revision of Chapter-2:	
	4		Revision of Chapter-3:	
15	1		Revision of Chapter-4:	
	2		Revision of Chapter-5:	
	3		Revision of Chapter-6:	
	4		Revision of Chapter-7:	

S. Satapathy