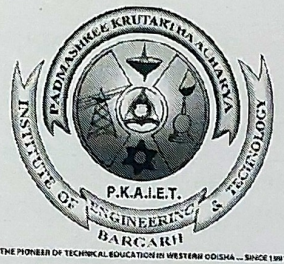


PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF  
ENGINEERING & TECHNOLOGY, BARGARH



LESSON PLAN

*Session: 2024-25*

2nd Semester      Branch- All

Subject: Applied Physics-II

*Dr. Niranjana Panda*

*Sr. Lect. in Physics*



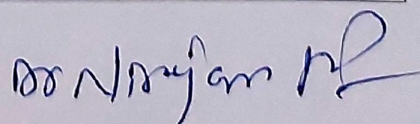
Subject: Applied Physics-II

No. of Days/per week Class allotted: 04

Semester from Date: 04-02-2025 To Date: 17-05-2025

No. of Weeks: 15

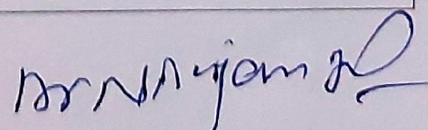
Week	Class Day	Theory /Practical Topics
1st	1	Wave motion, transverse and longitudinal waves with examples
	2	Definitions of wave velocity, frequency and wave length and their relationship
	3	Sound and light waves and their properties
	4	Wave equation ( $y = r \sin t$ ) amplitude, phase, phase difference
2nd	1	Principle of superposition of waves and beat formation.
	2	Simple Harmonic Motion (SHM):
	3	Definition of SHM, expression for displacement, velocity, acceleration, time period, frequency etc.
	4	Simple harmonic progressive wave & relation between them.
3rd	1	Simple harmonic progressive wave and energy transfer, study of vibration of cantilever and determination of its time period
	2	Free, forced and resonant vibrations with examples.
	3	Acoustics of buildings
	4	Reverberation, reverberation time, echo, noise & description of examples.
4th	1	Coefficient of absorption of sound, methods to control reverberation time and their applications
	2	Ultrasonic waves – Introduction and properties, engineering and medical applications of ultrasonic.
	3	Basic optical laws & related phenomena of optics.
	4	Reflection, refraction & term related to Reflection, refraction.
5th	1	Refractive index & numerical.
	2	Images and image formation by mirrors
	3	Lens and thin lenses, lens formula
	4	Power of lens, magnification and defects.
6th	1	Total internal reflection, Critical angle
	2	Conditions for total internal reflection, applications of total internal reflection in optical fiber.
	3	Optical Instruments & principle of Optical Instruments.
	4	Simple and compound microscope



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Week	Class Day	Theory /Practical Topics
7th	1	Astronomical telescope in normal adjustment
	2	Magnifying power, resolving power, uses of microscope and telescope, optical projection systems.
	3	Coulombs law, unit of charge
	4	Electric field, Electric lines of force and their properties
8th	1	Electric flux, Electric potential and potential difference & numerical
	2	Gauss law: Application of Gauss law to find electric field intensity of straight charged conductor
	3	Application of Gauss Law to plane charged sheet and charged sphere.
	4	Capacitor and its working
9th	1	Types of capacitors, Capacitance and its units.
	2	Capacitance of a parallel plate capacitor, Series and parallel combination of capacitors (related numerical), dielectric and its effect on capacitance, dielectric break down.
	3	Electric Current and its units, Direct and alternating current
	4	Resistance and its units, Specific resistance, Conductance, Specific conductance, Series and parallel combination of resistances.
10th	1	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)
	4	Concept of terminal potential difference and Electromotive force (EMF)
11th	1	Heating effect of current, Electric power, Electric energy and its units (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	Concept of electromagnetic induction
12th	1	Faraday's Laws, Lorentz force (force on moving charge in magnetic field).
	2	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.
	4	Energy bands in solids, Types of materials (insulator, semi-conductor, conductor)



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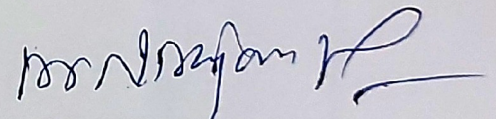
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Week	Class Day	Theory /Practical Topics
13th	1	Intrinsic and extrinsic semiconductors, p-n junction, junction diode and V-I characteristics, types of junction diodes.
	2	Diode as rectifier – half wave and full wave rectifier (centre taped).
	3	Transistor; description and three terminals, Types- pnp and npn, some electronic applications (list only).
	4	Photocells, Solar cells; working principle and engineering applications.
14th	1	Lasers: Energy levels, ionization and excitation potentials
	2	Spontaneous and stimulated emission; population inversion, pumping methods, optical feedback
	3	Types of lasers; Ruby, He-Ne and semiconductor, laser characteristics, engineering and medical applications of lasers.
	4	Fiber Optics: Introduction to optical fibers
15th	1	Light propagation, acceptance angle and numerical aperture, fiber types, applications in; telecommunication, medical and sensors.
	2	Nanoscience and Nanotechnology: Introduction, nanoparticles and nanomaterials,
	3	Properties at nanoscale, nanotechnology, nanotechnology based on examples.
	4	Devices and applications of nanotechnology



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