

Branch: Common		Semester-2nd	Math. & Sc. Department, Govt Polytechnic, Balasore Faculty Name: Nirupama Panda, Designation-Sr.lect Math & Sc(Phy).
Subject:- Applied Physics –II(Th-2)		No. of days/per Week class allotted-4P (4 Lectures)	Semester from date: 09/01/2026 No. of weeks:- 15
Week		Class day	Theory
1 st	UNIT I	1 st	WAVE MOTION AND ITS APPLICATIONS Wave motion , transverse and longitudinal waves with examples
		2 nd	Terms used in wave motion like displacement , amplitude , time period , frequency , wavelength , wave velocity , relationship between wave velocity , frequency , wavelength , related problems
		3 rd	Wave equation , Superposition of waves , beat formation
		4 th	Simple Harmonic Motion (SHM) : Definitions with examples simple Harmonic progressive wave and energy transfer
2 nd	UNIT I	1 st	Cantilever (study of its vibration , determination of time period)
		2 nd	Cantilever (study of its vibration , determination of time period) , Free, forced resonant vibrations with examples
		3 rd	Acoustics of buildings – reverberations, reverberation time,echo, Noise, Coefficient of absorption of sound , methods to control reverberation time.
		4 th	Ultrasonics (introduction and properties) and their engineering applications.
3 rd	UNIT - II	1 st	OPTICS Reflection and refraction (definition , laws , refractive index , Mirrors , image formation by mirrors)
		2 nd	Lens (thin lens , lens formula , power of lens)
		3 rd	Lens (Magnification and defects, related problems
		4 th	Total internal reflection , its applications , critical angle , conditions for total internal reflection
4 th	UNIT - II	1 st	Simple microscope with its uses
		2 nd	Compound microscope with its uses
		3 rd	Telescope with its uses , Magnifying power , resolving power , optical projection system
		4 th	Related problems
5 th	UNIT - III	1 st	ELECTROSTATICS Coulomb's law Electric field , Electric field lines (definition and properties)
		2 nd	Electric flux , Gauss law and its applications related problems

		3 rd	Electric potential related problems
		4 th	Electric field intensity , Electric field intensity of straight charge conductor
6 th	UNIT -III	1 st	Electric field intensity of plane sheet , charged sphere
		2 nd	Capacitor (Working , capacitance , types , formula , units , related numericals)
		3 rd	Parallel plate capacitor and its capacitance , related numerical
		4 th	Series and parallel combination of capacitors , related numerical
7 th	UNIT -IV	1 st	Dielectric and its effect on capacitance , dielectric breakdown
		2 nd	Related numerical solving.
		3 rd	CURRENT ELECTRICITY Electric current (DC and AC) with its unit
		4 th	Resistance , specific resistance , conductance , specific conductance and their unit .
8 th	UNIT -IV	1 st	Series combination of resistances with numerical
		2 nd	Parallel combination of resistances with numerical finding the equivalent resistance.
		3 rd	Ohm's law (verification , formula , related problems)
		4 th	Concept of potential difference and electric motive force (EMF) Kirchhoff's laws (KVL & KCL)
9 th	UNIT -IV	1 st	Wheatstone bridge & its applications
		2 nd	Heating effect of current , electric power and electric energy with numerical
		3 rd	Advantages of electric energy over other forms of energy
		4 th	MCQs and numerical solving
10 th	UNIT - V	1 st	ELECTROMAGNETISM Electromagnetic materials (Dia , Para , Ferro with their properties)
		2 nd	Magnetic field , magnetic field intensity with units
		3 rd	Magnetic field lines , magnetic flux and its units , magnetization
		4 th	Electromagnetic induction , Faraday's law
		1 st	Lorentz force (force on moving charge in magnetic field)
		2 nd	Force on current carrying conductor force on rectangular coil placed in magnetic field

11 th		3 rd	Moving coil galvanometer (principle , construction , working)
		4 th	Conversion of galvanometer in to ammeter , subject related problems
12 th	+ UNIT - VI	1 st	SEMICONDUCTOR PHYSICS Energy bands in solids
		2 nd	Types of materials (insulator , semi-conductor , intrinsic and extrinsic semiconductor) , Intrinsic and extrinsic semiconductor
		3 rd	p-n junction diode and VI characteristics
		4 th	Types of junction , diode as rectifier –Half wave rectifier
13 th		1 st	Full wave rectifier (center taped)
		2 nd	Transistor , description and three terminals , types (pnp , npn , some electric applications only)
		3 rd	Photocells , solar cells working principle and engineering applications
		4 th	Previous year question discussion.
14 th	+ UNIT -VII	1 st	MODERN PHYSICS Lasers (energy levels , ionization and excitation potentials , spontaneous and stimulated emission
		2 nd	Types of lasers (Ruby lasers , He-Ne laser , laser characteristics , engineering & medical applications of lasers)
		3 rd	He-Ne laser , laser characteristics
		4 th	Fibre optics (introduction to optical fibre ,light propagation acceptance angle and numerical aperture)
15 th		1 st	Fibre types application in telecommunication, medical and sensors.
		2 nd	Nanoscience and nanotechnology (nanoparticles , nanomaterials , properties at nanoscale)
		3 rd	Nanotechnology , Nanotechnology based devices and applications
		4 th	Previous year question discussion

Nirupama Panda
Signature Of Faculty