

IHARSUGUDA ENGINEERING SCHOOL, IHARSUGUDA

DEPARTMENT OF MATHEMATICS & SCIENCE

LESSON PLAN

NAME OF THE FACULTY:- BABITA PADHI & RITIKA DASHI

ACADEMIC YEAR:- 2024-25

COURSE NAME:- APPLIED PHYSICS-II

BRANCH:- ALL BRANCHES

COURSE CODE:- TH-2A

SECTION:-C,M(a),M(b),E,IT,ETC,COM,MCT


DURATION:- 60MINS

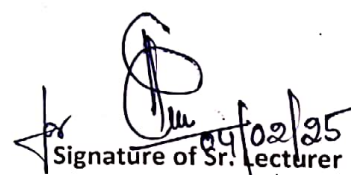
SEMESTER:- 2ND (1st year)

SESSION:- SUMMER

1.	1.	UNIT - 1: Wave motion and its applications :Wave motion, transverse and longitudinal waves with examples,
	2.	definitions of wave velocity, frequency and wave length and their relationship, Sound and light waves and their properties
	3.	Wave equation ($y = r \sin t$) amplitude, phase, phase difference, 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, study of vibration of cantilever and determination of its time period
	6.	Free, forced and resonant vibrations with examples. Acoustics of buildings – reverberation, reverberation time,
	7.	echo, noise, coefficient of absorption of sound, methods to control reverberation time and their applications,
	8.	Ultrasonic waves – Introduction and properties, engineering and medical applications of ultrasonic.
2.	9.	UNIT - 2: Optics: Basic optical laws; reflection and refraction, refractive index.
	10.	Images and image formation by mirrors, lens and thin lenses,
	11.	Lens formula, power of lens, magnification and defects.
	12.	Total internal reflection, Critical angle and conditions for total internal reflection.
	13.	Applications of total internal reflection in optical fiber.
	14.	Optical Instruments; simple and compound microscope, astronomical telescope in normal adjustment
	15.	Magnifying power, resolving power, uses of microscope.
	16.	Uses of telescope, Optical projection systems.
3.	17.	UNIT - 3: Electrostatics : Coulombs law, unit of charge, Electric field,
	18.	Electric lines of force and their properties, Electric flux
	19.	Electric potential and potential difference, Gauss law.
	20.	Application of Gauss law to find electric field intensity of straight charged conductor, plane charged sheet and charged sphere.
	21.	Capacitor and its working.
	22.	Types of capacitors, Capacitance and its units. Capacitance of a parallel plate capacitor
	23.	Series and parallel combination of capacitors (related numerical.
	24.	Dielectric and its effect on capacitance, dielectric break down.
4.	25.	UNIT - 4: Current Electricity: Electric Current and its units, Direct and alternating current
	26.	Resistance and its units, Specific resistance,

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


Signature of faculty member


Signature of Sr. Lecturer
Math & Sc
Sr. Lect. (M/Sc)
Engg. School
Jharsuguda