LESSON PLAN

SUBJECT: APPLIED PHYSICS-II

BRANCH: COMMON (CSE & TEXTILE)

SEMESTER: 2ND (2025-26)

NAME OF THE FACULTY: ASEEMA BARIK

GOVERNMENT POLYTECHNIC, BHADRAK

HOD, 07/01/2025
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GOVT. POLYTECHNIC BHADRAK

DEPARTMENT OF HUMANITIES & SCIENCES

LESSON PLAN (ACADEMIC SESSION 25-26)

Discipline: Physics	Semester: 2nd	Name of the Teaching Faculty: Aseema Barik
Subject: Applied Physics II	No of Days/Week class allotted: 4	Semester from Date: 09/01/2026 to 08/05/2026 No of weeks: 17
Week	**Class Day**	**Theory Topics**
1st	1st	Wave motion, transverse and longitudinal waves with examples,
	2nd	definitions of wave velocity, frequency and wave length and their relationship
	3rd	Sound and light waves and their properties, wave equation, amplitude, phase, phase difference
	4th	principle of superposition of waves and beat formation.
2nd	1st	Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency etc.
	2nd	Simple harmonic progressive wave and energy transfer
	3rd	study of vibration of cantilever and determination of its time period,
	4th	Free, forced and resonant vibrations with examples.
3rd	1st	Acoustics of buildings – reverberation, reverberation time, echo, noise, coefficient of absorption of sound, methods to control reverberation time and their applications
	2nd	Ultrasonic waves – Introduction and properties, engineering and medical applications of ultrasonic.
	3rd	Simple numericals
	4th	Simple numericals
4th	1st	Basic optical laws; reflection and refraction, refractive index
	2nd	Images and image formation by mirrors, image formation by lens and thin lenses
	3rd	lens formula, power of lens, magnification and defects
	4th	Total internal reflection, Critical angle and conditions for total internal reflection
5th	1st	applications of total internal reflection in optical fiber.
	2nd	Optical Instruments; simple and compound microscope
	3rd	astronomical telescope in normal adjustment, magnifying power, resolving power,
	4th	uses of microscope and telescope, optical projection systems
6th	1st	Simple numericals
	2nd	Simple numericals
	3rd	Coulombs law, unit of charge,
	4th	Electric field, Electric potential and potential difference
7th	1st	Electric lines of force and their properties, Electric flux, Gauss law: Statement & Explanation.
	2nd	Application of Gauss law to find electric field intensity of straight charged conductor, plane charged sheet and charged sphere.
	3rd	Capacitor and its working, Types of capacitors, Capacitance and its units.
	4th	Capacitance of a parallel plate capacitor, Series and parallel combination of capacitors (related numerical),
8th	1st	dielectric and its effect on capacitance, dielectric break down.
	2nd	Simple numericals
	3rd	Simple numericals
	4th	Electric Current and its units, Direct and alternating current, Resistance and its units, Specific resistance, Conductance, Specific conductance
	1st	Series and parallel combination of resistances

Week	Class Day	Theory Topics
9th	2nd	Factors affecting resistance of a wire, carbon resistances and colour coding
	3rd	Ohm's law and its verification, Kirchhoff's laws, Wheatstone bridge and its applications (slide wire bridge only),
	4th	Concept of terminal potential difference and Electromotive force (EMF)
10th	1st	Heating effect of current, Electric power, Electric energy and its units (related numerica problems), Advantages of Electric Energy over other forms of energy
	2nd	Simple numericals
	3rd	Simple numericals
	4th	Types of magnetic materials; dia, para and ferromagnetic with their properties,
11th	1st	Magnetic field and its units, magnetic intensity,
	2nd	magnetic lines of force, magnetic flux and units, magnetization.
	3rd	Concept of electromagnetic induction, Faraday's Laws,
	4th	Lorentz force (force on moving charge in magnetic field).
12th	1st	Force on current carrying conductor, force on rectangular coil placed in magnetic field.
	2nd	Moving coil galvanometer; principle, construction and working,
	3rd	Conversion of a galvanometer into ammeter and voltmeter.
	4th	Simple numericals
13th	1st	Simple numericals
	2nd	Energy bands in solids, Types of materials (insulator, semi-conductor, conductor),
	3rd	intrinsic and extrinsic semiconductors
	4th	p-n junction, junction diode and V-I characteristics, types of junction diodes.
14th	1st	Diode as rectifier – half wave and full wave rectifier (centre taped).
	2nd	Transistor; description and three terminals, Types- pnp and npn, some electronic applications (list only).
	3rd	Photocells, Solar cells; working principle and engineering applications
	4th	Simple numericals
15th	1st	Simple numericals
	2nd	Lasers: Energy levels, ionization and excitation potentials
	3rd	spontaneous and stimulated emission; population inversion, pumping methods,
	4th	optical feedback, Types of lasers; Ruby, He-Ne and semiconductor,
16th	1st	laser characteristics, engineering and medical applications of lasers.
	2nd	Fiber Optics: Introduction to optical fibers, light propagation, acceptance angle and numerical aperture
	3rd	fiber types, applications in; telecommunication, medical and sensors.
	4th	Nanoscience and Nanotechnology: Introduction, nanoparticles and nanomaterials, properties at nanoscale
17th	1st	nanotechnology, nanotechnology based devices and applications.
	2nd	Revision and Previous year question discussion
	3rd	Revision and Previous year question discussion
	4th	Revision and Previous year question discussion

27.01.2026

Signature of the Teaching Faculty

27/01/2026

Signature of HOD, Humanities & Sciences