

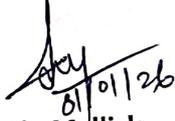
LESSON PLAN(APPLIED PHYSICS-II)
GOVT.POLYTECHNIC,SONEPUR

Discipline – All Branches	Semester-2 ND	Name of the teaching faculty:- SRI SILU MALLICK,LECT.STAGE-II(PHYSICS)
SESSION-2025-26(S)	Period per week-04	Commencement of classes from date:09.01.26 to 08.05.2026 No. of weeks : 15 (excluding vacation & Holidays)
Week	Class Day	TOPICS TO BE COVERED
1st	1st	UNIT - 1: Wave motion and its applications: Wave motion, transverse and longitudinal waves with examples, definitions of wave velocity, frequency and wave length and their relationship
	2nd	Sound and light waves and their properties, wave equation ($y = r \sin t$) amplitude, phase, phase difference
	3rd	Principle of superposition of waves and beat formation.
	4th	Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency etc.
2nd	1st	Simple harmonic progressive wave and energy transfer,
	2nd	study of vibration of cantilever and determination of its time period,
	3rd	Free, forced and resonant vibrations with examples.
	4th	Acoustics of buildings – reverberation, reverberation time, echo, noise, coefficient of absorption of sound,
3rd	1st	Methods to control reverberation time and their applications, Ultrasonic waves – Introduction and properties, engineering and medical applications of ultrasonic.
	2nd	UNIT - 2: Optics: Basic optical laws; reflection and refraction, refractive index, Images and image formation by mirrors,
	3rd	Lens and thin lenses, lens formula, power of lens, magnification and defects.
	4th	Total internal reflection, Critical angle and conditions for total internal reflection,
4th	1st	Applications of total internal reflection in optical fiber.
	2nd	Optical Instruments; simple and compound microscope,
	3rd	astronomical telescope in normal adjustment
	4th	Magnifying power, resolving power, uses of microscope and telescope, optical projection systems.
5th	1st	UNIT - 3: Electrostatics: Coulombs law, unit of charge, Electric field, Electric lines of force and their properties,
	2nd	Electric flux, Electric potential and potential difference,
	3rd	Gauss law: Application of Gauss law to find electric field intensity of straight charged conductor
	4th	plane charged sheet and charged sphere.

6th	1st	Capacitor and its working, Types of capacitors,
	2nd	Capacitance and its units. Capacitance of a parallel plate capacitor,
	3rd	Series and parallel combination of capacitors (related numerical),
	4th	dielectric and its effect on capacitance, dielectric break down.
7th	1st	UNIT - 4: Current Electricity: Electric Current and its units, Direct and alternating current, Resistance and its units,
	2nd	Specific resistance, Conductance, Specific conductance
	3rd	Series and parallel combination of resistances.
	4th	Factors affecting resistance of a wire, carbon resistances and colour coding.
8th	1st	Ohm's law and its verification, Kirchhoff's laws,
	2nd	Wheatstone bridge and its applications (slide wire bridge only),
	3rd	Concept of terminal potential difference and Electromotive force (EMF)
	4th	Heating effect of current, Electric power,
9th	1st	Electric energy and its units (related numerical problems),
	2nd	Advantages of Electric Energy over other forms of energy.
	3rd	UNIT - 5: Electromagnetism: Types of magnetic materials; dia, para and ferromagnetic with their properties,
	4th	, Magnetic field and its units, magnetic intensity, magnetic lines of force,
10th	1st	magnetic flux and units, magnetization.
	2nd	Concept of electromagnetic induction, Faraday's Laws,
	3rd	Lorentz force (force on moving charge in magnetic field).
	4th	Force on current carrying conductor, force on rectangular coil placed in magnetic field.
11th	1st	Moving coil galvanometer; principle, construction and working,
	2nd	Conversion of a galvanometer into ammeter and voltmeter.
	3rd	UNIT - 6: Semiconductor Physics: Energy bands in solids, Types of materials (insulator, semi-conductor, conductor)
	4th	intrinsic and extrinsic semiconductors,
12th	1st	p-n junction, junction diode and V-I characteristics, types of junction diodes.
	2nd	Diode as rectifier – half wave and full wave rectifier (centre taped).
	3rd	Transistor; description and three terminals,
	4th	Types- pnp and npn, some electronic applications (list only).
13th	1st	Photocells; working principle and engineering applications.
	2nd	Solar cells; working principle and engineering applications.

	3rd	UNIT - 7: Modern Physics: Lasers: Energy levels, ionization and excitation potentials;
	4th	spontaneous and stimulated emission;
14th	1st	population inversion, pumping methods, optical feedback,
	2nd	Types of lasers; Ruby, He- Ne and semiconductor,
	3rd	laser characteristics, engineering and medical applications of lasers.
	4th	Fiber Optics: Introduction to optical fibers,
15th	1st	light propagation, acceptance angle and numerical aperture,
	2nd	fiber types, applications in; telecommunication, medical and sensors.
	3rd	Nanoscience and Nanotechnology: Introduction, nanoparticles and nanomaterials,
	4th	properties at nanoscale, nanotechnology, nanotechnology based devices and applications

Prepared by:


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 HOD
 Math&Sc


 Academic co-ordinator