



GOVERNMENT POLYTECHNIC DARLIPALI, SUNDARGARH

ସରକାରୀ ବହୁବୃତ୍ତି ଅନୁଷ୍ଠାନ ଦଲିପାଲି, ସୁନ୍ଦରଗଡ଼

GOVERNMENT OF ODISHA | ଓଡ଼ିଶା ସରକାର

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DEPARTMENT OF HUMANITIES & SCIENCES

LESSON PLAN (ACADEMIC SESSION 25-26)

Discipline: Physics	Semester: 2nd	Branch: Mechatronics and AE & IE	Name of the teaching faculty: Rashmi Rekha Behera
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 No. of Period Available: 60	
Month	Week	No of periods available	Class Day Theory topics to be covered
JANUARY	1st	3P	Wave motion, transverse and longitudinal waves with examples, definitions of wave velocity, frequency and wave length and their relationship
			Sound and light waves and their properties, wave equation ($y = r \sin t$) amplitude, phase, phase difference
			Principle of superposition of waves and beat formation
	2nd	3P	Simple Harmonic Motion (SHM): definition, expression for displacement, velocity, acceleration, time period, frequency etc
			Simple harmonic progressive wave and energy transfer
			Study of vibration of cantilever and determination of its time period
	3rd	4p	Free, forced and resonant vibrations with examples
			Acoustics of buildings – reverberation, reverberation time, echo, noise
			Coefficient of absorption of sound, methods to control reverberation time and their applications
			Ultrasonic waves – Introduction and properties, engineering and medical applications of ultrasonic.
	4th	2p	Basic optical laws; reflection and refraction, refractive index, Images and image formation by mirrors
			Lens and thin lenses, lens formula
			Power of lens, magnification and defects

FEBRUARY

5th

3P

Total internal reflection, Critical angle and conditions for total internal reflection, applications of total internal reflection in optical fiber

Optical Instruments; simple microscope

6th

4P

Compound microscope

Astronomical telescope in normal adjustment, magnifying power, resolving power, Uses of microscope and telescope, optical projection systems
Coulombs law, unit of charge, Electric field

Electric lines of force and their properties

7th

4P

Electric flux, Electric potential and potential difference

Gauss law: Application of Gauss law to find electric field intensity of straight charged conductor

Application of Gauss law to find electric field intensity of plane charged sheet and charged sphere

Capacitor and its working, Types of capacitors, Capacitance and its units, Capacitance of a parallel plate capacitor

Series and parallel combination of capacitors (related numerical)

8th

4P

Dielectric and its effect on capacitance, dielectric break down

Electric Current and its units, Direct and alternating current

Resistance and its units, Specific resistance, Conductance, Specific conductance

9th

3P

Series and parallel combination of resistances

Numerical

Factors affecting resistance of a wire, carbon resistances and colour coding

10th

4P

Ohm's law and its verification

Kirchhoff's laws

Wheatstone bridge and its applications (slide wire bridge only)

Concept of terminal potential difference and Electromotive force (EMF)

11th

3P

Heating effect of current, Electric power

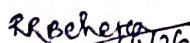
Electric energy and its units (related numerical problems), Advantages of Electric Energy over other forms of energy

Types of magnetic materials; dia, para and ferromagnetic with their properties

Magnetic field and its units, magnetic intensity

MARCH

APRIL	12th	4P	Magnetic lines of force, magnetic flux and units, magnetization
			Concept of electromagnetic induction, Faraday's Laws, Lorentz force (force on moving charge in magnetic field)
			Force on current carrying conductor
	13th	3P	Force on rectangular coil placed in magnetic field
			Moving coil galvanometer; principle, construction and working
			Conversion of a galvanometer into ammeter and voltmeter
			Numerical
	14th	4P	Energy bands in solids, Types of materials (insulator, semi-conductor, conductor)
			Intrinsic and extrinsic semiconductors, p-n junction
			Junction diode and V-I characteristics, types of junction diodes
			Diode as rectifier – half wave and full wave rectifier (centre taped).
	15th	4P	Transistor; description and three terminals, Types- pnp and npn, some electronic applications (list only)
			Photocells, Solar cells; working principle and engineering applications
			Lasers: Energy levels, ionization and excitation potentials; spontaneous and stimulated emission; population inversion, pumping methods, optical
	16th	4P	Types of lasers; Ruby, He-Ne
			Semiconductor Laser, Laser characteristics, engineering and medical applications of lasers
			Fiber Optics: Introduction to optical fibers, light propagation, acceptance angle and numerical aperture
			Fiber types, applications in; telecommunication, medical and sensors
MAY	17th	4P	Nanoscience and Nanotechnology: Introduction, nanoparticles and nanomaterials, properties at nanoscale
			Nanotechnology, nanotechnology based devices and applications.
			Revision of important topics and previous year question papers discussion
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 Rashmi Rekha Behera
 Lect. Stg. I (Physics)