DEPARTMENT OF MATHEMATICS AND SCIENCE
ORISSA SCHOOL OF MINING ENGINEERING, KEONJHAR

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Discipline: Electrical, Metallurgy and Mining	Yearly Pattern	Name of the Teaching Faculty: **Prajna Priyadarshinee Rout , Lecturer (Stage-II) in Physics**
Subject: APPLIED PHYSICS LAB	No. of class allotted per week:**02**	Semester From date: **17.08.2026** To Date: **17.04.2027** No.of Weeks: **35**
PRE-REQUISITE	Basic knowledge about Optics, Electricity, Properties of matter	
Course outcomes (COs)	**CO1:** Use precision measuring instruments such as Vernier callipers, screw gauges, and spherometers to determine the dimensions and physical parameters of various objects with accuracy. **CO2:** Apply the principles of mechanics to verify laws of forces, friction, Hooke's law, and determine the moment of inertia of a flywheel through experimental investigations. **CO3:** Demonstrate and verify the fundamental laws of geometrical optics, including reflection and refraction, and determine optical parameters using appropriate laboratory techniques. **CO4:** Perform electrical circuit experiments to verify Ohm's law, Kirchhoff's laws, and the laws of resistances in series and parallel combinations. **CO5:** Analyze capacitor and galvanometer characteristics by determining capacitance, permittivity of air, galvanometer resistance, and converting a galvanometer into measuring instruments such as ammeters and voltmeters. **CO6:** Investigate the electrical behaviour of semiconductor devices by plotting V-I characteristics of diodes and determining important parameters such as knee voltage.	

Month	Week	Class Day	Theory/Practical Topics	DELIVERY METHOD
August	1st	1ST	**EXPERIMENT-1** To measure length, radius of a given cylinder, a test tube and a beaker using a Vernier caliper and find volume of each object ➢ **Practical demonstration**	Whiteboard & PPT
		2ND	➢ **Experimentation by students**	
	2nd	1ST	➢ **Observation: Data collection by students** ➢ **Calculation**	Whiteboard & PPT
		2ND	Record writting	
September	3rd	1ST	**EXPERIMENT-2** To determine diameter of a wire, a solid ball and thickness of card board using a screw gauge.	Whiteboard & PPT
		2ND	➢ **Experimentation by students**	
	4TH	1ST	➢ **Observation: Data collection by students** ➢ **Calculation**	Demonstration & PPT
		2ND	**Record Checking & viva**	

	5TH	1ST	**EXPERIMENT-3** To determine radius of curvature of a convex and a concave mirror/surface using a spherometer. . ➢ **Practical demonstration**	Demonstration & PPT
		2ND	➢ **Experimentation by students**	
	6TH	1ST	➢ **Observation: Data collection by students** **Calculation**	
		2ND	**Record Checking & viva**	
	7TH	1ST	**EXPERIMENT-4** To verify triangle and parallelogram law of forces. ➢ **Practical demonstration**	Whiteboard & PPT
		2ND	**Experimentation by students**	
	8TH	1ST	➢ **Observation: Data collection by students** ➢ **Calculation**	Demonstration & PPT
		2ND	➢ **Record Checking & viva**	
October	9TH	1ST	**EXPERIMENT-5** To determine force constant of a spring using Hooke's Law. ➢ **Practical demonstration**	Whiteboard & PPT
		2ND	➢ **Experimentation by students**	
	10TH	1ST	➢ **Observation: Data collection by students** ➢ **Calculation**	
		2ND	➢ **Record Checking & viva**	
	11TH	1ST	**EXPERIMENT-6** To find the viscosity of a given liquid (Glycerin) by Stoke's law. ➢ **Practical demonstration**	Whiteboard & PPT
		2ND	➢ **Experimentation by students**	
November	12TH	1st	➢ **Observation: Data collection by students** ➢ **Calculation**	
		2nd	➢ **Record Checking & viva**	
	13TH	1ST	**EXPERIMENT-7** To verify laws of reflection from a plane mirror/interface. ➢ **Practical demonstration**	Whiteboard & PPT
		2ND	**Experimentation by students**	
	14TH	1ST	➢ **Observation: Data collection by students** ➢ **Calculation**	
		2ND	**Record Checking & viva**	
	15th	1st	**EXPERIMENT-8** To verify laws of refraction (Snell's law) using a glass slab.	Whiteboard & PPT

			➢ Practical demonstration	
		2nd	➢ Experimentation by students	
December	16th	1st	➢ Observation: Data collection by students ➢ Calculation	
		2nd	➢ Record Checking & viva	
	17th	1st	**EXPERIMENT-9** **To verify Ohm's law plotting graph between current and potential difference.** ➢ Practical demonstration	Whiteboard & PPT
		2nd	➢ Experimentation by students	
	18th	1st	➢ Observation: Data collection by students ➢ Calculation	
		2nd	➢ Record Checking & viva	
	19th	1st	**EXPERIMENT-10** **To verify laws of resistances in series and parallel combination.** ➢ Practical demonstration	Whiteboard & PPT
		2nd	Experimentation by students	
	20th	1st	➢ Observation: Data collection by students ➢ Calculation	
		2nd	➢ Record Checking & viva	
January	21st	1st	Record Checking & viva	
		2nd	Record Checking & viva	
	22nd	1st	**EXPERIMENT-11** To verify Kirchhoff's law using electric circuits. ➢ Practical demonstration	Whiteboard & PPT
		2nd	Experimentation by students	
	23rd	1st	➢ Observation: Data collection by students ➢ Calculation	
		2nd	➢ Record Checking & viva	
	24th	1st	**EXPERIMENT-12** To study the dependence of capacitance of a parallel plate capacitor on various factors and determines permittivity of air at a place. ➢ Practical demonstration	Whiteboard & PPT
		2nd	➢ Experimentation by students	

February	25th	1st	➢ **Observation: Data collection by students** ➢ **Calculation**	
		2nd	➢ **Record Checking & viva**	
	26th	1st	**EXPERIMENT-13** **To find resistance of a galvanometer by half deflection method.** ➢ **Practical demonstration**	Whiteboard & PPT
		2nd	➢ **Experimentation by students**	
	27th	1st	➢ **Observation: Data collection by students** ➢ **Calculation**	
		2nd	**Record Checking & viva**	
	28th	1st	**EXPERIMENT-14** To convert a galvanometer into a Ammeter. ➢ **Practical demonstration**	Whiteboard & PPT
		2nd	➢ **Experimentation by students**	
March	29th	1st	➢ **Observation: Data collection by students** ➢ **Calculation**	
		2nd	➢ **Record Checking & viva**	
	30th	1st	**EXPERIMENT-15** To convert a galvanometer into a voltmeter. ➢ **Practical demonstration**	Whiteboard & PPT
		2nd	➢ **Experimentation by students**	
	31st	1st	➢ **Observation: Data collection by students** ➢ **Calculation**	
		2nd	**Record Checking & viva**	
	32nd	1st	**EXPERIMENT-16** To draw V-I characteristics of a semiconductor diode (Ge,Si) and determine its knee voltage. ➢ **Practical demonstration**	Whiteboard & PPT
		2nd	➢ **Experimentation by students**	
April	33rd	1st	➢ **Observation: Data collection by students**	
		2nd	➢ **Calculation**	
	34th	1st	➢ **Record Checking & viva**	
		2nd	➢ **Record Checking & viva**	
	35th	1st	➢ **Record Checking & viva**	
		2nd	➢ **Record Checking & viva**	

LEARNING RESOUCES:

1. Applied Physics-I by Prof. Vinod Kumar Yadav
2. Text Book of Physics for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi
3. Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publications (P) Ltd., New Delhi
4. Practical Physics by C. L. Arora, S. Chand & Company Ltd.
5. e-books/e-tools/ learning physics software/you Tube videos/ websites etc.

P.P.Rout 14/08/2021

Signature of Concerned Faculty

P.P.Rout
(Lect. II in Phys.)

P.P.Rout 14/08/2021

Signature of HOD

Principal 12.8.21
School of Mining Engineering
Keonjhar