Program : **Diploma in Engineering and Technology**	
Course Code : **2006**	Course Title: **Applied Physics Lab**
Semester : **1 & 2**	Credits: **2**
Course Category: **Basic Science**	
Periods per week: **2 (L: 0 T: 0 P: 2)**	Periods per semester: **30 + 30**

Course Objectives:

- To supplement the factual knowledge gained in physics by first hand manipulation of apparatus.
- To develop scientific temper which will help the leaner to apply the basic concepts and principles of physics in solving engineering and technology-based problems.
- To provide necessary confidence in handling equipment and thus learn various skills in measurement.

Course Prerequisites:

Topic	Program / Course name
Basic knowledge in Physics	Secondary School

Course Outcomes:

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Select appropriate measuring tools and make measurements with accuracy and precision.	12	Applying
CO2	Apply and illustrate the concepts of mechanics and properties of matter through experiments	23	Applying
CO3	Experiment with lens, prism and glass slab to realize the basic laws of ray optics.	6	Applying
CO4	Make use of V- I characteristics of conductors and semiconductors to determine the resistance of materials.	15	Applying

	Series Test	4	

CO – PO Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2	3						
CO3	3						
CO4	3						

Course Outline

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Select appropriate measuring tools and make measurements with accuracy and precision**		
M1.01	To determine the volume of a spherical / cylindrical body and a test tube by measuring its dimensions using Vernier calipers.	3	Applying
M1.02	To determine diameter of a wire, a solid ball and thickness of glass plate using a screw gauge	3	Applying
M1.03	To determine radius of curvature of a spherical surface using a spherometer..	3	Applying
M1.04	To measure room temperature and temperature of a hot bath using mercury thermometer and convert it into different scales.	3	Applying

Experiments

1. **Vernier Calipers**: To determine the volume of a spherical / cylindrical body and a test tube by measuring its dimensions using vernier calipers.
2. **Screw gauge**: To determine diameter of a wire, a solid ball and thickness of glass plate using screw gauge.
3. **Spherometer**: To determine radius of curvature of a spherical surface using a spherometer
4. **Mercury thermometer:** To measure room temperature and temperature of a hot bath using mercury thermometer and convert it into different scales.

CO2	**Apply and illustrate the concepts of mechanics and properties of matter through experiments**		
M2.01	To verify Hooke's law and determine force constant of a spring using Hooke's law apparatus.	2	Applying
M2.02	To find the coefficient of viscosity of a given liquid by measuring the terminal velocity of a spherical body.	2	Applying
M2.03	To verify parallelogram law of forces and find the mass of the given body.	2	Applying
M2.04	To determine the mass of the given body using moment bar.	3	Applying
M2.05	To determine the relative density of liquid using U-tube apparatus.	3	Applying
M2.06	To find the moment of inertia of a flywheel	3	Applying
M2.07	To determine acceleration due to gravity at a place by measuring the time period of a simple pendulum	3	Applying
M2.08	To determine the velocity of sound in air at room temperature using resonance column apparatus.	2	Applying
M2.09	To determine and verify the time period of oscillation of a cantilever.	3	Applying
	Lab Exam I	2	

Experiments

5. **Hooke's law**: To verify Hooke's law and determine force constant of a spring using Hooke's law apparatus.
6. **Stoke's law**: To find the coefficient of viscosity of a given liquid by measuring the terminal velocity of a spherical body.
7. **Parallelogram law of forces:** To verify parallelogram law of forces and find the mass of the given body.
8. **Moment bar:** To determine the mass of the given body using moment bar.
9. **U-tube apparatus:** To determine the relative density of liquid using U-tube apparatus.
10. **Flywheel:** To find the moment of inertia of a flywheel.
11. **Simple pendulum:** To determine acceleration due to gravity at a place by measuring the time period of a simple pendulum
12. **Resonance column:** To determine the velocity of sound in air at room temperature using resonance column apparatus
13. **Cantilever:** To find the time period of oscillations of a cantilever

CO3	**Experiment with lens, prism and glass slab to realize the basics laws of ray optics.**		
M3.01	To determine focal length and power of a convex lens by u-v method	3	Applying
M3.02	To verify laws of refraction (Snell's law) using a glass slab/glass prism.	3	Applying

Experiments

14. Convex lens: To determine focal length and power of a convex lens by u-v method
15. Snell's law: To verify Snell's law using a glass slab/glass prism.

CO4	**Make use of V- I characteristics of conductors and semiconductors to determine the resistance of materials**		
M4.01	To verify Ohm's law by plotting graph between current and potential difference.	3	Applying
M4.02	To verify laws of resistances in series and parallel combination.	3	Applying
M4.03	To draw V-I characteristics of a semiconductor diode (Ge, Si) and determine its knee voltage.	3	Applying
M4.04	To determine internal resistance of a primary cell / comparison of emfs using potentiometer.	3	Applying
M4.05	To determine specific resistance of material of the given wire using Meter bridge.	3	Applying
	Lab Exam II	2	

Experiments

16. Ohm's law: To verify Ohm's law by plotting graph between current and potential difference.
17. Law of resistances: To verify laws of resistances in series and parallel combination.
18. Semiconductor diode: To draw V-I characteristics of a semiconductor diode (Ge, Si) and determine its knee voltage.
19. Potentiometer: To determine internal resistance of a primary cell / comparison of emfs using potentiometer.
20. Meter bridge: To determine specific resistance of material of the given wire.

Note: Experiments shall be conducted such that all the COs are attained.

Minimum of 12 experiments shall be performed.

The CIA shall be arranged in both the semesters by the faculty in charge.

The ESE shall be conducted at the end of second semester

Text / Reference

T/R	Book Title/Author
R1	Text Book of Physics for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi
R2	Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publications (P) Ltd., New Delhi
R3	Practical Physics by C. L. Arora, S. Chand & Company Ltd.

Online Resources

Sl. No	Website Link
1	e-books/e-tools/ learning physics software/you Tube videos/ websites etc.