



Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

Department of Physics

UG Semester I

Course Code: SEC I

Course Title: Physics Workshop Skill

Course Code: 101PHY1601

Hours/Week: 02

Marks: 50

Credits: 02

Lectures: 30 Hrs.

Learning Objective:

- LO 1. To enable the students to familiar and experience with various mechanical and electrical tools through hands-on mode.
- LO 2. Understand the fundamental principles of mechanics and their application in physics.
- LO 3. Develop critical thinking and problem-solving skills in the context of mechanical systems.

Course Outcomes:

After completion of course the student will be able to-

- CO 1. Determine radius and diameter of thin wires, sheets using laboratory gauge
- CO 2. Measure the dimensions of various bodies,
- CO 3. Measure the current and voltage by using multimeters
- CO 4. Determine the thickness, diameter, volume and dimensions of the mechanical object.
- CO 5. Different types of welding for metal boxes and wooden boxes.
- CO 6. Overview the types of multimeters, its features and applications.

Unit No.	Title of Unit & Contents	Hrs.
I	Measuring Units and Mechanical skill	7
	Unit I Measuring Units 1. Introduction: Measuring units, Conversion to SI and CGS, 2. Familiarization with meter scale, Vernier calliper, Screw gauge and their utility, 3. Measure the dimension of a solid block, volume of cylindrical beaker/glass, 4. Diameter of a thin wire, thickness of metal sheet, etc. 5. Study of common materials used for manufacturing like steel, copper, iron, metal sheets, composites and alloy, wood, Concept of machine processing.	

Unit No.	Title of Unit & Contents	Hrs.
	Unit Outcome UO 1. Identify Physical quantities with their international system of units and perform conversions among SI units using Scientific notations. UO 2. Employ measuring skills to use them to design and build useful products.	
II	Use of Multimeters	8
	1. Overview of multimeters: types, features, and applications. 2. Understanding electrical measurements: voltage, current, and resistance. 3. Operation of oscilloscope, Making regulated power supply, 4. Timer circuit, Electronic switch using transistor and relay.	
	Unit Outcome: UO 1. Operate multimeters to check AC and DC current, voltage, resistance and electrical current levels by connecting two leads to various electrical system components.	
Practical No.	List of Experiments	15
1	To determine radius, diameter, cross sectional area of various thin wires.	
2	To determine thickness, breadth of metal sheets and wooden blocks using Vernier calliper and screw gauge.	
3	To measure various types of boxes and package dimensions.	
4	To determine Volume of cylindrical beaker/glass.	
5	Drilling of holes of different diameters in metal sheet and wooden block.	
6	Similar and Dissimilar metal welding.	
7	Cutting of the metal sheet and Smoothing of cutting edge using file.	
8	Use of multimeters for continuity testing, AC and DC current and Voltage measurement and Resistance measurements.	

N.B.: At least five experiments should be performed from above.

Learning Resources:

1. Problems in General Physics, I.E. Irodov (Publisher: CBS Publishers & Distributors)
2. Engineering Physics, R.K. Gaur and S.L. Gupta (Publisher: Dhanpat Rai Publications)
3. Principles of Physics, V.K. Mehta (Publisher: S. Chand Publishing)
4. Problems in General Physics, I.E. Irodov (Publisher: CBS Publishers & Distributors)

5. A Textbook of Engineering Physics" by Avadhanulu and P.G. Kshirsagar (Publisher: S. Chand Publishing)
6. Electrical Installation Estimating & Costing, J.B. Gupta, S.K. Kataria Publication.
7. Electrical Installation Estimating & Costing , S. Singh, Dhanpat Rai Publication.
8. Basic Electrical Engineering (Vol-I), P.S. Dhogal, S.K. Mandal, Tata McGraw Hill Publication.
9. Concepts of Physics, H.C. Verma (Publisher: Bharati Bhawan Publishers)
10. General Physics Laboratory Experiments, Gopalan Srinivasan, Rao Bidthanapally, Kendall Hunt Pub Co; 5th edition (June 30, 2019).