

Semester	II
Course ^{*1}	Major
Paper Title / CODE	<u>Lab 1 (GPM & Mechanics) & (Lab2) Electricity – Thermal Physics / C1PH 230221P</u>
No. of Credits ^{*2}	4
Theory / Practical / Composite	Practical
Minimum No. of preparatory hours per week a student has to devote	4
Number of Modules	2
Syllabus	<p><u>Module A: Lab 1 (GPM & Mechanics)</u></p> <p><u>GPM & Mechanics Lab</u> [36L]</p> <ol style="list-style-type: none"> 1. Measurements of length (or diameter) using vernier calliper, screw gauge and traveling microscope. 2. Introduction to accuracy, precision, significant figures, types of errors, error calculation, graphical representation of data and curve fitting. 3. To determine the moment of inertia of a cylinder about an axis passing through its centre of gravity and perpendicular to its length using a cylinder as an auxillary body and compare the moment of inertia thus obtained with the theoretical value calculated with the measured mass and dimensions of the bar. 4. To determine the Moment of Inertia of a Flywheel. 5. To determine g and velocity for a freely falling body using Digital Timing Technique 6. To determine the Young's Modulus by Flexure method. 7. To determine the Modulus of Rigidity of a Wire by Maxwell's needle. 8. To determine the surface tension of water using capillary action 9. To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method).

	<p>Module B (Lab2) Electricity – Thermal Physics Lab [36L]</p> <ol style="list-style-type: none"> 1. Use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, (d) Capacitances. 2. To determine an unknown Low Resistance using Carey Foster's Bridge. 3. To verify the Thevenin and Norton theorems and verification of maximum power transfer theorem. 4. To verify the Superposition and Reciprocity theorem 5. To determine self-inductance of a coil by Anderson's bridge. 6. To study response curve of a series LCR circuit and determine its (a) resonant frequency (b) impedance at resonance (c) quality factor (d) band width. 7. To determine the mutual inductance between a pair of coils using a ballistic galvanometer. 8. To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charlton's disc method. 9. To determine the temperature coefficient of resistance by Platinum Resistance Thermometer (PRT). 10. To study the variation of thermo-emf of a thermocouple with difference of temperature of its two junctions.
<p>Learning Outcomes *3</p>	<ol style="list-style-type: none"> (1) Learn to work with basic measurement instruments for precise measurement of dimensions and electrical quantities. (Module A & Module B) (2) Set up experiments to verify laws of mechanics as well as Electricity and Thermal Physics.(Module A & Module B) (3) Understand the connections with underlying physics covered in the theory papers.(Module A & Module B) (4) Prepares them for undertaking advanced Lab practices and industrial internship.(Module A & Module B)
<p>Reading/Reference Lists *4</p>	<p>Module A</p> <ol style="list-style-type: none"> 1. Advanced Practical Physics, Vol. 1 and 2, B. Ghosh & K.G. Mazumder, Sreedhar Publishers 2. Practical Physics by Chattopadhyay and Rakshit, 3. Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House 4. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers 5. A Text Book of Practical Physics, I. Prakash& Ramakrishna, 11th Edn, 2011, KitabMahal 6. Engineering Practical Physics, S.Panigrahi& B.Mallick,2015, Cengage Learning India Pvt. Ltd. 7. Practical Physics, G.L. Squires, 2015, 4th Edition, Cambridge University Press.

	Module B	
	<ol style="list-style-type: none"> 1. Advanced Practical Physics (Volume-1 & 2) by B. Ghosh & K.G. Majumder, Sreedhar Publishers 2. Practical Physics by Chattopadhyay and Rakshit, 3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition,• reprinted 1985, Heinemann Educational Publishers 4. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia• Publishing House 5. A Text Book of Practical Physics, I. Prakash& Ramakrishna, 11th Ed., 2011, KitabMahal 6. Engineering Practical Physics, S.Panigrahi and B. Mallick, 2015, Cengage Learning.• 7. A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal, 1985, Vani Pub. 	
Evaluation	Theory CIA: Semester Exam:	Practical (if applicable) CA: 85 Semester Exam: 15
Paper Structure for Theory Semester Exam		

Template for Paper Submission

- *1: Major / Minor / Multi-Disciplinary / Ability Enhancement / Skill Enhancement / Value-Added.
- *2: In case of composite paper, kindly mention the credit allotted to theory and practical components separately.
- *3: Learning outcomes should preferably contain one or two outcomes related to social / environmental consciousness.
- *4: The list should preferably contain one or two online courses developed by SWAYAM, NPTEL, etc.