

Physics Department Laboratories and Research Facilities

PHYSICS LABORATORY(PL)- 01

The Physics Laboratory - 01 serves as a space for hands-on learning and experimentation, offering a comprehensive platform for students to delve into the fundamental principles of physics including Mechanics, Thermal Physics etc. Equipped with a diverse array of apparatus, the laboratory facilitates an immersive exploration of these core concepts.



Students have the opportunity to engage with classic experiments like the Anderson's apparatus, which illuminates the principles of projectile motion, and the free fall experiment, which allows them to study the acceleration due to gravity. They can also explore the complexity of thermal physics through experiments involving Thermo emf, which investigates the relationship between temperature and electromotive force, and the B-H curve experiment, which delves into the magnetic properties of materials. The laboratory further houses a flying wheel apparatus, which allows students to analyze the concepts of rotational motion and angular momentum, and many more such apparatus have been kept in the laboratory. These diverse experiments, conducted with the aid of specialized apparatus, provide students with a tangible understanding of the theoretical concepts they encounter in their coursework. The lab is equipped with a smart board and a projector, enhancing the learning environment by providing clear visual aids for demonstrations and discussions. The laboratory environment fosters critical thinking, problem-solving skills, and a deep appreciation for the practical applications of physics in the real world.

PHYSICS LABORATORY) - 02

The Physics Laboratory - 02 serves as a vibrant hub for exploring the intricate world of electricity, magnetism, light and matter, and modern physics. This laboratory is equipped with a diverse array of apparatus designed to deepen the understanding of these fundamental principles. Students engage in a range of experiments related to electricity and magnetism, including the use of a ballistic galvanometer, a sensitive instrument that measures electrical currents, and various setups for studying the properties of electric circuits and magnetic fields. The laboratory also provides a platform for exploring the fascinating realm of light and matter. Equipped with an optics bench, students conduct experiments involving lenses, mirrors, and prisms to investigate the principles of reflection, refraction, and diffraction. Additionally, a dedicated dark room attached to the laboratory serves as a specialized space for conducting experiments related to spectroscopy, where students analyze the spectral properties of light emitted by various sources.



Beyond these traditional areas, the laboratory also delves into the exciting frontiers of modern physics. Students have access to apparatus and resources that allow them to

explore the nature of light and matter at the atomic level. The diverse range of experiments and equipment in the laboratory provides students with a comprehensive and engaging learning experience, fostering a deeper understanding of the fundamental laws of physics.

PHYSICS LABORATORY - 03

This laboratory is a well-equipped space designed to facilitate learning in the fields of electrical circuits, waves and oscillations, and analog electronics and digital electronics. This laboratory provides students with a platform to explore fundamental concepts and gain practical experience in these crucial areas of physics. Equipped with a wide range of tools and equipment, including breadboards, wires, CROs (Cathode Ray Oscilloscopes), function generators, LEDs, and more, students can design, build, and test various circuits and systems. The laboratory features a projector to ensure a comfortable and conducive learning environment, allowing for clear visual demonstrations and discussions. Students engage in a variety of experiments, including analyzing electrical circuits, exploring the behavior of resistors, capacitors, inductors, and diodes in various configurations. They delve into the characteristics of waves and oscillations, studying sound waves, light waves, and electromagnetic waves using specialized equipment. The laboratory also provides a platform for understanding the fundamental concepts of analog and digital electronics, allowing students to build and test simple analog and digital circuits, including logic gates and basic digital systems. The laboratory's emphasis on hands-on learning allows students to develop essential skills in circuit design, troubleshooting, and data analysis. By working with real-world components and systems, they gain a deeper understanding of the theoretical concepts and their practical applications.



SKILL ENHANCEMENT COURSES (PCB DESIGNING AND FABRICATION) :

The PCB (Printed Circuit Board) Skill Enhancement Course offered in our laboratories provides students with a comprehensive understanding of the design, fabrication, and assembly of PCBs. Utilizing the powerful KiCad software, students embark on a journey of hands-on learning, guided by experienced instructors in our dedicated laboratories. The course begins with an introduction to PCB design principles, encompassing component selection, schematic creation, and layout design. Students learn to utilize KiCad's intuitive interface to create professional-grade schematics and board layouts, adhering to industry standards. This includes defining footprints for each component, routing traces for electrical connections, and ensuring proper clearance and spacing between components. Once the design is finalized, students are introduced to the intricacies of PCB fabrication, including the selection of appropriate materials, such as FR-4 or G10, and understanding the different manufacturing processes involved. These processes include **etching, plating, and drilling**, which are used to create the conductive pathways and vias on the PCB. Students also learn about quality control measures, such as impedance matching and signal integrity, to ensure the PCB functions as intended. The course culminates in a practical session where students assemble their designed PCBs in our laboratories, soldering components, and testing their functionality using multimeters and oscilloscopes. This hands-on experience fosters a deep understanding of the entire PCB lifecycle, from concept to realization, equipping students with the skills necessary to succeed in the electronics industry.

