

**MES COLLEGE MARAMPALLY**  
**DEPARTMENT OF PHYSICS**

**Course Outcome**

B. Sc. Physics programme endeavors to instill in students with a genuine interest in the understanding of fundamental laws of Physics, to foster a creative spirit for learning, to become inventive scientists and to become successful in a wide range of professions.

**Programme Educational Objectives**

- The graduates will become successful professionals by demonstrating logical and analytical thinking abilities.
- The graduates will work and communicate effectively in inter-disciplinary environment, either independently or in a team, and demonstrate leadership qualities.
- The graduates will engage in life-long learning and professional development through self-study, continuing education or professional and doctoral level studies.

**B.Sc Programme Outcomes**

Upon completion of the B. Sc.Physics programme students will be able to:

- Create a hypothesis and appreciate how it relates to broader theories.
- Evaluate hypotheses, theories, methods and evidence within their proper contexts.
- Solve complex problems by critical understanding, analysis and synthesis.
- Demonstrate engagement with current research and developments in the subject.
- Critically interpret data, write reports and apply the basics of rules of evidence.
- Select, interpret and critically evaluate information from a range of sources that include books, scientific reports, journals, case studies and the internet.

- Develop proficiency in the analysis of complex physical problems and the use of mathematical or other appropriate techniques to solve them.
- Demonstrate skills in the use of computers for control, data acquisition, and data analysis in experimental investigations
- Provide a systematic understanding of core physical concepts, principles and theories along with their applications.
- Function on multidisciplinary teams by working cooperatively, creatively and responsibly as a member of a team.
- Communicate effectively by oral, written, computing and graphical means.
- Recognize the need to engage in lifelong learning through continuing education and research.

## **AIMS AND OBJECTIVES OF THE PROGRAMME**

### **Aims:**

The Board of Studies in Physics (UG) recognizes that curriculum, course content and assessment of scholastic achievement play complementary roles in shaping education. The committee is of the view that assessment should support and encourage the broad instructional goals such as basic knowledge of the discipline of Physics including phenomenology, theories and techniques, concepts and general principles. This should also support the ability to ask physical questions and to obtain solutions to physical questions by use of qualitative and quantitative reasoning and by experimental investigation. The important student attributes including appreciation of the physical world and the discipline of Physics, curiosity, creativity and reasoned skepticism and understanding links of Physics to other disciplines and to societal issues should give encouragement. With this in mind, we aim to provide a firm foundation in every aspect of Physics and to explain a broad spectrum of modern trends in physics and to develop experimental, computational and mathematics skills of students.

The programme also aims to develop the following abilities:

1. Read, understand and interpret physical information – verbal, mathematical and graphical.
2. Impart skills required to gather information from resources and use them.
3. To give need based education in physics of the highest quality at the undergraduate level.
4. Offer courses to the choice of the students.
5. Provide an intellectually stimulating environment to develop skills and enthusiasms of students to the best of their potential.
6. Use Information Communication Technology to gather knowledge at will.
7. Attract outstanding students from all backgrounds.

**Objectives:**

The syllabi are framed in such a way that it bridges the gap between the plus two and post graduate levels of Physics by providing a more complete and logical framework in almost all areas of basic Physics. By the end of the first year (2nd semester), the students should have attained a common level in basic mechanics, a secure foundation in mathematics, Chemistry (otherwise specified), Languages and other relevant subjects to complement the core for their future courses and developed their experimental and data analysis skills through experiments at laboratories. By the end of the second year (4<sup>th</sup> semester), the students should have been introduced to powerful tools for tackling a wide range of topics in Optics, Laser, Fiber optics, Semiconductor devices and circuits. Along with Languages, they should have been familiar with additional relevant techniques in mathematics, Chemistry or Electronics/Computer application and developed their experimental and data analysis skills through a wide range of experiments through practical at laboratories. By the end of the third year (6th semester)r, the students should have developed their understanding of core Physics by covering a range of topics in almost all areas of physics including Classical and Quantum Mechanics, Electricity and Electrodynamics, Relativity and spectroscopy, Thermal and Statistical Physics, Nuclear and Particle physics, Solid State Physics, Digital Electronics etc. along with one choice based

courses, Open course and had experience of independent work such as projects; seminars etc. and thereby developing their experimental skills through a series of experiments which also illustrate major themes of the lecture courses.

### **B Sc Physics**

<b>COURSE CODE</b>	<b>COURSE</b>	<b>OUTCOME</b>
PH1B01U	Methodology in Physics	<ul style="list-style-type: none"> <li>➤ This course will be an introduction to the pursuit of Physics, its history and methodology.</li> <li>➤ The course also aims at emphasizing the importance of measurement which is central to physics.</li> </ul>
PH2B01U	Mechanics and Properties of Matter	<ul style="list-style-type: none"> <li>➤ This course would empower the student to acquire engineering skills and practical knowledge, which help the student in their everyday life.</li> <li>➤ This syllabus will cater the basic requirements for their higher studies.</li> <li>➤ This course will provide a theoretical basis for doing experiments in related areas.</li> </ul>
PH3B01U	Electronics	<ul style="list-style-type: none"> <li>➤ To know the physical principles and applications of Electronics is most necessary for a Physics student.</li> </ul>
PH4B01U	Electricity and Electrodynamics	<ul style="list-style-type: none"> <li>➤ Electricity and Electrodynamics have the key role in the development of modern technological world. Without electric power and communication facilities, life on earth stands still.</li> <li>➤ A course in electricity and electrodynamics is thus an essential component of physics programme at graduate level.</li> <li>➤ This course is expected to provide a sound foundation in electricity and electrodynamics.</li> </ul>
PH5B01U	Classical and Quantum Mechanics	<ul style="list-style-type: none"> <li>➤ This course is a prelude to advanced theoretical studies in Condensed Matter Physics, Spectroscopy,</li> </ul>

		Astrophysics, Electrodynamics and Nuclear Physics.
PH5B02U	Physical Optics and Photonics	➤ This course aims to provide necessary foundation in optics and photonics which prepare the students for an intensive study of advanced topics at a later stage
PH5B04U	Digital Electronics	➤ This course is expected to provide necessary back ground for applications of electronics in mathematical computation.
PH5B03U	Thermal and Statistical Physics	➤ This course is to develop a working knowledge of statistical mechanic and to use this knowledge to explore various applications related to topics in material science and the physics of condensed matter.
PH5D01U	<b>Open course</b> Energy and Environmental Studies	➤ The course creates concern among the students on energy conservation and environmental protection.
PH6B03U	Condensed Matter Physics	<ul style="list-style-type: none"> <li>➤ This course is intended to provide an introduction to the physics of Condensed Matter.</li> <li>➤ This study attempts to explain various types of phenomena like electro-magnetic properties, super-conductivity and super fluidity.</li> </ul>
PH6B04U	Relativity and Spectroscopy	➤ This course is intended to introduce principles of spectroscopy and special theory of relativity.
PH6B01U	Computational Physics	➤ This course is intended to give an insight to computer hardware and computer applications.
PH6B02U	Nuclear and Particle Physics	➤ This course intended to explore the interior of nucleus and interaction between nucleons
PH6B05U	<b>Choice Based Course</b> Nanoscience and Nanotechnology	➤ . This field is truly interdisciplinary in nature, and concerns with the fabrication and manipulations of few atoms and molecules to form mesopic structures with dimensions ranging between 1-100 nm.

		<ul style="list-style-type: none"><li>➤ The science of nanometer scale objects is Nanoscience. The resulting technology is called Nanotechnology.</li><li>➤ This introductory course is provided to get knowledge in Nanoscience and nanotechnology</li></ul>
--	--	---