

Programme Specific Outcomes based on curriculum

Undergraduate Programme

B.Sc. (Physics)

2020

INTRODUCTION

The undergraduate programs of B.Sc.(Honours) in Physics is a gateway to the world of opportunities. It is aimed to provide a broad framework within which the undergraduate students in Physics can create an academic base that responds to the need of the students to understand the basics of Physics and its ever evolving nature of applications in explaining all the observed natural phenomenon as well as predicting the future applications to the new phenomenon with a global perspective.

The course has designed and standardized in such a way to maintain the achievement in terms of knowledge, understanding and skills in Physics and their applications to the natural phenomenon as well as the development of scientific attitudes and values appropriate for rational reasoning, critical thinking and developing skills to solve problems at foremost.

Not only to strong at inner level but also to take initiatives research to and fro i.e., initiating research at global level. This creates an environment to develop and inculcate rational, ethical and moral attitudes and values to help the creation of knowledge society needed for scientific advancement of our nation.

The motto of undergraduates program is to develop and inculcate rational, ethical and moral attitudes and values to help the creation of knowledge society needed for scientific advancement of our nation.

PROGRAMME SPECIFIC OUTCOMES IN B.Sc (Honours) PHYSICS

The student graduating with the Degree B.Sc. (Honours) Physics should be able to

- ❖ Acquire fundamental/systematic or coherent understanding of the academic field of Physics, its different learning areas and applications in basic Physics like Astrophysics, Material science, Nuclear and Particle Physics, Condensed matter Physics, Atomic and Molecular Physics, Mathematical Physics, and its linkages with related disciplinary areas/subjects like Chemistry, Mathematics, Life sciences, Environmental sciences, Atmospheric Physics, Computer science etc procedural knowledge that creates different types of professionals related to the disciplinary/subject area of Physics, including professionals engaged in research and development, teaching and government/public service; skills in areas related to one's specialization area within the disciplinary/subject area of Physics and current and emerging developments in the field of Physics.

- ❖ Demonstrate the ability to use skills in Physics and its related areas of technology for formulating and tackling Physics-related problems and identifying and applying appropriate physical principles and methodologies to solve a wide range of problems associated with Physics.
- ❖ Recognize the importance of mathematical modeling simulation and computing, and the role of approximation and mathematical approaches to describing the physical world.
- ❖ Plan and execute Physics-related experiments or investigations, analyze and interpret data/information collected using appropriate methods, including the use of appropriate software such as programming languages and purpose-written packages, and report accurately the findings of the experiment/investigations while relating the conclusions/findings to relevant theories of Physics.
- ❖ Demonstrate relevant generic skills and global competencies such as
 - Problem-solving skills that are required to solve different types of Physics-related problems with well-defined solutions, and tackle open-ended problems that belong to the disciplinary area boundaries.
- ❖ Investigative skills, including skills of independent investigation of Physics-related issues and problems.
- ❖ Communication skills involving the ability to listen carefully, to read texts and research papers analytically and to present complex information in a concise manner to different groups/audiences of technical or popular nature.
- ❖ Analytical skills involving paying attention to detail and ability to construct logical arguments using correct technical language related to Physics and ability to translate them with popular language when needed.
 - ICT skills.
 - Personal skills such as the ability to work both independently and in a group.
- ❖ Demonstrate professional behavior such as
 - being objective, unbiased and truthful in all aspects of work and avoiding unethical,
 - Irrational behavior such as fabricating, falsifying or misrepresenting data or committing plagiarism.
 - The ability to identify the potential ethical issues in work-related situations.
 - Appreciation of intellectual property, environmental and sustainability issues and
 - promoting safe learning and working environment

ATTRIBUTES OF PHYSICS AT UG LEVEL

Some of the characteristic attributes of a graduate in Physics are

- Disciplinary knowledge and skills: Capable of demonstrating good knowledge and understanding of major concepts , theoretical problems and experimental findings in Physics and its different subfields like Astrophysics and Cosmology.
- Material science, Nuclear and Particle Physics, Condensed matter Physics, Atomic and Molecular Physics, Mathematical Physics, Analytical dynamics, Space science and other related fields of study, including broader interdisciplinary subfields like Chemistry, Mathematics, Life sciences, Environmental sciences, Atmospheric Physics, Computer science, Information Technology etc.
- Ability to use modern instrumentation and laboratory techniques to design and perform experiments is highly desirable in almost all the fields of Physics listed above in
- Skilled communicator: Ability to transmit complex technical information relating all areas in Physics in a clear and concise manner in writing and oral ability to present complex and technical concepts in a simple language for better understanding.

- Critical thinker and problem solver: Ability to employ critical thinking and efficient problem solving skills in all the basic areas of Physics.
- Sense of inquiry: Capability for asking relevant/appropriate questions relating to the issues and problems in the field of Physics, and planning, executing and reporting the results of a theoretical or experimental investigation.
- Team player/worker: Capable of working effectively in diverse teams in both classroom, laboratory, Physics workshop and in industry and field-based situations.
- Skilled project manager: Capable of identifying/mobilizing appropriate resources required for a project, and manage a project through to completion, while observing responsible and ethical scientific conduct; and safety and laboratory hygiene regulations and practices.
- Digitally Efficient: Capable of using computers for simulation studies in Physics and computation and appropriate software for numerical and statistical analysis of data.
- Ethical awareness / reasoning: The graduate should be capable of demonstrating ability to think and analyze rationally with modern and scientific outlook and identify ethical issues related to one's work, avoid unethical behavior such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights, and adopting objectives, unbiased and truthful actions in all aspects of work.
- National and international perspective: The graduates should be able to develop a national as well as international perspective for their career in the chosen field of the academic activities. They should prepare themselves during their most formative years for their appropriate role in contributing towards the national development and projecting our national priorities at the international level pertaining to their field of interest and future expertise.
- Lifelong learners: Capable of self-paced and self-directed learning aimed at personal development and for improving knowledge/skill development and reskilling in all areas.