

# **Department of Physics, Bundelkhand University, Jhansi(UP) (M.Sc. Physics Programme)**

## **INTRODUCTION**

M.Sc. Physics is a two years (four semesters) Post Graduate level course intended to prepare competent youth to develop specialized knowledge and skills to engage themselves in scientific activities. This learning outcomes-based curriculum framework (LOCF) for the postgraduate programs in Physics is intended to provide a broad framework within which both the postgraduate programs in Physics help to 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. This course is designed and formulated in order to acquire and maintain standards of 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 for problem solving and initiating research which are competitive globally. The multicultural fabric of our nation requires that the institutions involved in implementing this curriculum framework also work hard towards providing an environment to create, develop and inculcate rational, ethical and moral attitudes and values to help the creation of knowledge society needed for scientific advancement of our nation.

After successful completion of the course the learner will also be competent and confident to capture and join various job opportunities at public and private sectors. Besides planning career in area of research and development, learners can also prepare themselves in teaching and academics.

## **PROGRAM LEARNING OUTCOMES (PLO)**

The learning outcome based curriculum framework in Physics should also allow for the flexibility and innovation in the program design of the PG education, and its syllabi development, teaching learning process and the assessment procedures of the learning outcomes. The process of learning is defined by the following steps which should form the basis of final assessment of the achievement at the end of the program:-

1. The accumulation of facts of nature and the ability to link the facts to observe and discover the laws of nature i.e. develop an understanding and knowledge of the Physics.
2. The ability to use this knowledge to analyze new situations and learn skills and tools like mathematics, engineering and technology to find the solution, interpret the results and make predictions for the future developments.
3. The ability to synthesize the acquired knowledge, understanding and experience for a better and improved comprehension of the physical problems in nature and to create new skills and tools for their possible solutions.
4. Competency to respond on contemporary needs of Research and development and equip them with necessary knowledge, wisdom and skills relevant for local, national and international governance.

The conceptualization and formulation of the learning outcomes for M.Sc. Physics program is aimed to achieve all the above.

## **PROGRAMME SPECIFIC OUTCOMES (PSO)**

The program specific outcomes of the M.Sc. Physics program are as under:

1. A systematic and coherent understanding of basic physics including the concepts, theories and relevant experimental techniques in the domains of Mechanics, Thermal Physics, Electricity and Magnetism, Modern Physics, Optics, Mathematical Physics and of the specialized fields like Nuclear and Particle Physics, Quantum Physics, Embedded Systems, etc. in their choice of Discipline Specific Elective course.
2. A wide ranging and comprehensive experience in physics laboratory methods in experiments related to mechanics, optics, thermal physics, electricity, magnetism, digital electronics, solid state physics and modern physics. Students acquire the ability for systematic observations, use of scientific research instruments, analysis of observational data, making suitable error estimates and scientific report writing.

3. Ability to relate their understanding of physics to other subjects like Mathematics, Chemistry, Computer Science or Electronics, which are part of their curriculum, and hence orient their knowledge and work towards multi-disciplinary/inter-disciplinary contexts and problems.
4. Procedural knowledge that creates different types of professionals related to different areas of study in Physics and multi/interdisciplinary domains, including research and development, teaching, technology professions, and government and public service.
5. Skills in areas related to specializations, relating the subfields and current developments in the field of Physics.

## **PROGRAMME SCHEME**

It is based on 'The UGC guidelines on adaption of Choice Based Credit System (C.B.C.S.)', is going to introduce Credit Based Semester System (C.B.S.S.) at the M.Sc. (Physics) level from the Academic Session 2021-22. This is four semesters (each semester of about 90 days) academic program (02 years duration). The UGC has also given the option to modify the course contents according to specific needs. After a thorough review of this Curriculum of Choice Based Credit System by the members of Board of studies of Physics, it has felt necessary to reorganize the course content, number of papers and their order so as to give it a more systematic and balanced look. Despite the changes, basic common framework and spirit of the Curriculum i.e. to enhance the quality and standard of education as proposed by the UGC, remains unchanged.