

## **AIM AND OBJECTIVES OF BSc PHYSICS**

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. Perform experiments and interpret the results of observation, including making an assessment of experimental uncertainties.
6. Provide an intellectually stimulating environment to develop skills and enthusiasms of students to the best of their potential.
7. Use Information Communication Technology to gather knowledge at will.
8. Attract outstanding students from all backgrounds.

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, physical optics, a secure foundation in mathematics, Chemistry, 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 fourth semester, the students should have been introduced to powerful tools for tackling a wide range of topics in Mechanics and Basic Electronics Semiconductor devices and circuits. Along with Languages, they should have been familiar with additional relevant techniques in mathematics, Chemistry and developed their experimental and data analysis skills through a wide range of experiments through practical at laboratories.

By the end of the sixth semester, the students should have developed their understanding of core Physics by covering a range of topics in almost all areas of physics including Quantum Mechanics, Electricity and Electrodynamics, Relativity and spectroscopy, Thermal and Statistical Physics, Nuclear and Particle physics, Solid State Physics, Optoelectronics, Digital Electronics and Microprocessor etc. along with two choice based courses 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.

## **SEMESTER I**

### **PH1CRT01-METHODOLOGY AND PERSPECTIVES OF PHYSICS**

**OBJECTIVES:** This course will be an introduction to the pursuit of Physics, its history and methodology. The course also aims at emphasizing the importance of measurement which is central to physics.

### **AE1VOT01: PRINCIPLES OF ELECTRONIC COMPONENTS**

**OBJECTIVES:** This course is expected to give a familiarization of various electronic Components

### **AE1VOT02- ELECTRONIC APPLICATIONS**

**OBJECTIVES:** This course is expected to provide knowledge of various electronic circuits and its application.

## **SEMESTER II**

### **PH2CRT02-MECHANICS AND PROPERTIES OF MATTER**

**OBJECTIVES:** This course would empower the student to acquire engineering skills and

practical knowledge, which help the student in their everyday life. This syllabus will cater the basic requirements for their higher studies. This course will provide a theoretical basis for doing experiments in related areas.

#### **AE2VOT03- BASICS OF POWER ELECTRONICS**

**OBJECTIVES:** This course is expected to provide a knowledge of various Power Electronic components and its application.

#### **AE2VOT04- POWER ELECTRONICS**

**OBJECTIVES:** This course is expected to provide a knowledge of various Power electronic circuits and its application.

### **SEMESTER III**

#### **PH3CRT03-OPTICS ,LASER AND FIBRE OPTICS**

**OBJECTIVES:** 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

#### **AE3VOT05-MICROPROCESSOR AND INTERFACING DEVICES**

**OBJECTIVES::** This course is expected to provide knowledge of Micro Processor and Interfacing Devices.

#### **AE3VOT06- COMMUNICATION ELECTRONICS**

#### **OBJECTIVES:**

This course is expected to provide knowledge of various communication systems and its working.

### **SEMESTER IV**

#### **PH4CRT04-SEMICONDUCTOR PHYSICS**

**OBJECTIVES:** We are living in a wonder world of Electronics. To know the physical principles and applications of Electronics is most necessary for a Physics student. This course is intended to provide this know-how.

#### **AE4VOT07-LINEAR INTEGRATED CIRCUITS**

**OBJECTIVES::** This course is expected to provide knowledge of various Linear Integrated Electronic circuits and its application.

## **AE4VOT08- APPLICATIONS OF MICROPROCESSORS**

**OBJECTIVES:** This course is expected to provide knowledge of architecture and applications of Microprocessors

## **SEMESTER V**

### **PH5CRT05-ELECTRICITY AND ELECTRODYNAMICS**

**OBJECTIVES:** 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. A course in electricity and electrodynamics is thus an essential component of physics programme at graduate level. This course is expected to provide a sound foundation in electricity and electrodynamics.

### **PH5CRT06-CLASSICAL AND QUANTUM MECHANICS**

**OBJECTIVES:** This course is a prelude to advanced theoretical studies in Condensed Matter Physics, Spectroscopy, Astrophysics, Electrodynamics and Nuclear Physics

### **PH5CRT07-DIGITAL ELECTRONICS**

**OBJECTIVES:** This course is expected to provide necessary back ground for applications of electronics in mathematical computation.

### **PH5CRT08 – ENVIRONMENTAL PHYSICS AND HUMAN RIGHTS**

**OBJECTIVES:** The course creates concern among the students on environmental protection and human rights.

## **OPEN COURSE**

### **PH5OPT02-PHYSICS IN DAILY LIFE**

**OBJECTIVES-** The course creates concern among the students on energy conservation and applications of physics in daily life.

## **SEMESTER VI**

### **PH6CRT09- THERMAL AND STATISTICAL PHYSICS**

**OBJECTIVES::** This course is to develop a working knowledge of statistical mechanics and to use this knowledge to explore various applications related to topics in material science and the physics of condensed matter.

### **PH6CRT11 –NUCLEAR,PARTICLE AND ASTROPHYSICS**

**OBJECTIVES:** This course intended to explore the interior of nucleus and interaction between nucleons

### **PH6CRT12-CONDENSED MATTER PHYSICS**

**OBJECTIVES::** This course is intended to provide an introduction to the physics of Condensed Matter. This study attempts to explain various types of phenomena like electro-magnetic properties, super-conductivity and super fluidity

### **PH6CRT10-RELATIVITY AND SPECTROSCOPY**

**OBJECTIVES::** This course is intended to introduce principles of spectroscopy and special theory of relativity.

### **CHOICE BASED COURSE:**

### **PH6CBT03-COMPUTATIONAL PHYSICS**

**OBJECTIVES::** This course is intended to give an insight to computer hardware and computer applications.

## **BSc PHYSICS**

### **OUTCOMES**

#### **The programme outcome:**

By the end of the first year (2nd semester), the students would have attained a common level in basic mechanics, physical optics, a secure foundation in mathematics, Electronics, 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 fourth semester, the students will be introduced to powerful tools for tackling a wide range of topics in Mechanics and Basic Electronics Semiconductor devices and circuits. As a result, they will be familiar with additional relevant techniques in mathematics, Electronics and developed their experimental and data analysis skills through a wide range of experiments through practical at laboratories.

By the end of the sixth semester, the students should have developed their understanding of core Physics by covering a range of topics in almost all areas of physics including Quantum Mechanics, Electricity and Electrodynamics, Relativity and spectroscopy, Thermal and Statistical Physics, Nuclear and Particle physics, Solid State Physics, Optoelectronics, Digital Electronics and Microprocessor etc. along with two choice based courses 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.

#### **The programme specific outcome:**

1. Read, understand and interpret physical information – verbal, mathematical and graphical.
2. Impart skills required to gather information from resources and use them.
3. Students will be able to Perform experiments and interpret the results of observation, including making an assessment of experimental uncertainties.
4. Students would have developed skills and enthusiasms to the best of their potential.
5. They will be able to use Information Communication Technology to gather knowledge at will.

## **SEMESTER I**

### **PH1CRT01-METHODOLOGY AND PERSPECTIVES OF PHYSICS**

#### **OUTCOME:**

By learning this course , students will get an introduction to the pursuit of Physics, its history and methodology. The students also learn the importance of measurement and the methodology of using different measuring devices which is central to physics.

### **AE1VOT01: PRINCIPLES OF ELECTRONIC COMPONENTS**

**OUTCOME:** The students will be familiarized various electronic Components.

### **AE1VOT02- ELECTRONIC APPLICATIONS**

**OUTCOME:** The student's gain knowledge of various electronic circuits and its application.

## **SEMESTER II**

### **PH2CRT02-MECHANICS AND PROPERTIES OF MATTER**

**OUTCOME:** This course would empower the student to acquire engineering skills and practical knowledge, theoretical basis for doing experiments in related areas, which help the student in their everyday life. Students will gain basic knowledge for their higher studies.

### **AE2VOT03- BASICS OF POWER ELECTRONICS**

**OUTCOME:** students gain knowledge on Power Electronic components and its application.

### **AE2VOT03- POWER ELECTRONICS**

**OUTCOME:** students gain knowledge on Power Electronic circuits and its application.

## **SEMESTER III**

### **PH3CRT03-OPTICS,LASER AND FIBRE OPTICS**

**OUTCOME:** foundation in optics and photonics is gained by this course and which which prepare the students for an intensive study of advanced topics at a later stage.

### **AE3VOT05- MICRO PROCESSOR AND INTERFACING DEVICES**

**OUTCOME:** Basic knowledge of Micro Processor and Interfacing Devices are gained by this course.

### **AE3VOT06- COMMUNICATION ELECTRONICS**

**OUTCOME:** Knowledge of various communication systems and its working is learned.

## **SEMESTER IV**

### **PH4CRT04:SEMICONDUCTOR PHYSICS**

**OUTCOME:** The physical principles and applications of Electronics which is most necessary for a Physics student is understood by this course.

### **AE4VOT07- LINEAR INTEGRATED CIRCUITS**

**OUTCOME:** various Linear Integrated Electronic circuits and its application may be understood by this course.

### **AE4VOT08- APPLICATIONS OF MICROPROCESSORS**

**OUTCOME:** This course provides knowledge of architecture and applications of Microprocessors.



## **SEMESTER V**

### **PH5CRT05-ELECTRICITY AND ELECTRODYNAMICS**

OUTCOME: 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. By this course student get a sound foundation in electricity and electrodynamics.

### **PH5CRT07-CLASSICAL AND QUANTUM MECHANICS**

OUTCOME: The theoretical background to study Condensed Matter Physics, Spectroscopy, Astrophysics, Electrodynamics and Nuclear Physics is gained by this course.

### **PH5CRT07-DIGITAL ELECTRONICS**

OUTCOME: **necessary** back ground for applications of electronics in mathematical computation is gained by this course.

### **PH5CRT08-ENVIRONMENTAL PHYSICS AND HUMAN RIGHTS**

OUTCOME: The course creates concern among the students on energy conservation and environmental protection.

### **OPEN COURSE:**

### **PH5OPT02-PHYSICS IN DAILY LIFE**

OUTCOME: This course creates concern among the students on applications of physics in daily life

## **SEMESTER VI**

### **PH6CRT09-THERMAL AND STATISTICAL PHYSICS**

**OUTCOME:** Working knowledge of statistical mechanics is gained by this course and which may be used to explore various applications related to topics in materials science and the physics of condensed matter.

### **PH6CRT10-NUCLEAR , PARTICLE AND ASTROPHYSICS**

**OUTCOME:** This course explores the interior of nucleus and interaction between nucleons and develops a research interest in nuclear physics.

### **PH6CRT12-CONDENSED MATTER PHYSICS**

**OUTCOME:** An introduction to the physics of Condensed Matter is given by this course. Knowledge and explanation on various types of phenomena like electro-magnetic properties, super-conductivity and super fluidity is given.

### **PH6CRT10-RELATIVITY AND SPECTROSCOPY**

**OUTCOME:** Principles of spectroscopy and its applications and basic idea of relativity is given to the students.

## **CHOICE BASED COURSE**

### **PH6CBT04: COMPUTATIONAL PHYSICS**

**OUTCOME:** An insight to computer hardware and computer applications is given by this course.