

## **DEPARTMENT OF PHYSICS**

### **A. PROGRAMME OUTCOME (PO)**

- Evaluate the role of science, mathematics, and technology in addressing current issues facing local and global communities.
- Drives scientific and societal advancement through technological innovation and entrepreneurship.
- Acquire domain knowledge
- Strengthen critical thinking and reasoning skills
- Develop effective communication skills
- Imbibe human values, inclusiveness attitude and socio-cultural sensitivity
- Build up self-esteem and competence to face challenges
- Attain life-readiness through problem-solving skills and competencies
- Work effectively in groups to meet a shared goal with people whose disciplinary and cultural backgrounds differ from their own.
- Develop appropriate methods of research, investigation, and design, to solve problems in science, mathematics, and technology.

### **B. PROGRAMME SPECIFIC OUTCOMES (PSO) – Model 1**

- Read, understand and interpret physical information – verbal, mathematical and graphical.
- Impart skills required to gather information from resources and use them in daily life.
- Perform experiments and interpret the results of observation, including making an assessment of experimental uncertainties.
- Provide an intellectually stimulating environment to develop skills and enthusiasms of students to the best of their potential and provide a need based education in physics of the highest quality at the undergraduate level.
- Use and familiarize Information Communication Technology to gather knowledge at will.
- Developing Harmony with nature and its various phenomena

## C. PROGRAMME SPECIFIC OUTCOMES (PSO) – Model II

- Read, understand and interpret physical information – verbal, mathematical and graphical.
- Impart skills required to gather information from resources and use them in daily life.
- To prepare students to enter Masters programmes like M.Sc, M.B.A, MBA and pursue professional programmes and jobs.
- Provide an intellectually stimulating environment to develop skills and enthusiasms of students to the best of their potential and provide a need based education in physics of the highest quality at the undergraduate level.
- Use and familiarize Information Communication Technology to gather knowledge at will.
- Developing Harmony with nature and its various phenomena

## D. COURSE OUTCOMES (CO)

| Course Code | Title of the Course                                                    |
|-------------|------------------------------------------------------------------------|
| PH5CRT01    | METHODOLOGY AND PERSPECTIVES OF PHYSICS                                |
| PH5CRT02    | Mechanics and properties of Matter                                     |
| PH5CRT03    | optics and photonics                                                   |
| PH5CRT04    | Semiconductor physics                                                  |
| PH5CRT05    | Electricity and Electrodynamics                                        |
| PH5CRT06    | Classical and Quantum Mechanics                                        |
| PH5CRT07    | Digital Electronics and Programming                                    |
| PH5CRT08    | Environmental Physics and Human Rights                                 |
| PH5OPT0X    | Open Course                                                            |
| PH6CRT09    | Thermal and Statistical Physics                                        |
| PH6CRT10    | Relativity and Spectroscopy                                            |
| PH6CRT11    | Nuclear, Particle and Astrophysics                                     |
| PH6CRT12    | Solid State Physics                                                    |
| PH6CBT0X    | Choice Based Course                                                    |
|             |                                                                        |
|             |                                                                        |
|             |                                                                        |
| -           | <u>course outcomes Bsc physics model 1 &amp; model 2 - core papers</u> |

Paper code

|          |                                         |
|----------|-----------------------------------------|
| PH5CRT01 | METHODOLOGY AND PERSPECTIVES OF PHYSICS |
|----------|-----------------------------------------|

- 1 This course will be an introduction to the pursuit of Physics, its history and methodology.
- 2 Students should get General knowledge of the development of physics and the nature of scientific inquiry
- 3 Form an idea about the various stages in the development of physics
- 4 The course also aims at emphasizing the importance of measurement which is primal of physics.

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|----------|------------------------------------|
| PH5CRT02 | Mechanics and properties of Matter |
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- 1 Develop a theoretical knowledge among students about Mechanics & properties of matter
- 2 Felicity to formulate and numerically solve problems.
- 3 Students will gain basic knowledge for their higher studies.
- 4 This course would empower the student to acquire engineering skills and practical knowledge, which help the student in their everyday life.

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| PH5CRT03 | optics and photonics |
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- 1 This course offer a strong foundation in optics and photonics.
- 2 should have gained knowledge of properties of light.
- 3 prepare the students for an intensive study of advanced topics at a later stage like lasers & photonics
- 4 students will be able to design practical systems based on optics

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|----------|-----------------------|
| PH5CRT04 | Semiconductor physics |
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- 1 This course is intended to provide this know-how the physical principles and applications of Electronics is most necessary for a Physics student in a wonder world of Electronics.
- 2 Understand the band diagram and depletion layer in PN junctions
- 3 Understand the fundamental operation of a active and passive electronic components
- 4 The course provides theoretical basis for Electronics and doing experiments in related areas.

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| PH5CRT05 | Electricity and Electrodynamics |
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- 1 provide a sound theoretical foundation in electricity and electrodynamics.
- 2 This course thatch students the importance of Electricity and Electrodynamics have the key role in the development of modern technological world .

- 3 This course aims to provide students with an introduction to the principles and behaviours of dynamical electric and magnetic systems and the course will begin with the application of electromagnetic theory to study various phenomena around them.
- 4 This course directs to acquire engineering skills and practical knowledge among students that help them in their future life

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|----------|---------------------------------|
| PH5CRT06 | Classical and Quantum Mechanics |
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- 1 This course aims to introduce students to the elegant Lagrangian and Hamiltonian formulations of Newtonian mechanics and the associated formalism.
- 2 This course is a prelude to advanced theoretical studies in Condensed Matter Physics, Spectroscopy, Astrophysics, Electrodynamics and Nuclear Physics.
- 3 This course in quantum mechanics will provide students with a broad and comprehensive introduction and a foundation for further study.
- 4 This course directs to acquire skills and practical knowledge among students that help them in their succeeding life

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| PH5CRT07 | Digital Electronics and Programming |
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- 1 This course is expected to provide necessary background for its wide applications of digitalelectronics in modern technology
- 2 This course is intended to give an insight to modern electronic gadgets and its working principle.
- 3 This course is expected provide basic ideas of Programming and preliminary steps in C++ programming.
- 4 This course help to acquire programming skills and practical knowledge among students .

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| PH5CRT08 | Environmental Physics and Human Rights |
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- 1 The course creates concern among the students on environmental protection.
- 2 The course creates concern among the students on energy conservation and also this course is designed to make the students aware of challenging energy crisis and alternative energy solutions.
- 3 Educates students about Human Rights.
- 4 This course aim to develop young generations who are caring more about our earth.

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| PH6CRT09 | Thermal and Statistical Physics |
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- 1 Thermal physics and statistical mechanics is concerned with the study of macroscopic and mesoscopic systems and this course will aim to

understand the properties of systems and processes that occur in such systems.

- 2 This course puts the concepts of thermodynamics on a firm foundation of mechanics, its importance in the development of modern physics, from the understanding of stars to the simple thermometer
- 3 This course will train students to use the acquired knowledge to explore various applications related to topics in material science and the physics of condensed matter.
- 4 This course helps to gain experimental skills among students.

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|----------|-----------------------------|
| PH6CRT10 | Relativity and Spectroscopy |
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- 1 This course is intended to introduce basic principles of spectroscopy
- 2 Students would learn the framework of "special theory of relativity" and how that may be useful for future.
- 3 Students will be able to analyse data from an experimental absorption and emission spectra.
- 4 This course provides students with the opportunity to conduct advanced experimental investigations in spectroscopy.

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| PH6CRT11 | Nuclear, Particle and Astrophysics |
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- 1 The students are introduced to the basic tenants of nuclear physics and particle physics.
- 2 The students should be well versed by the end of the course by the basic building blocks of nature and the four fundamental interactions
- 3 A good introduction to the basics of astronomy and astrophysics will be given in the course.
- 4 This develops a research interest in nuclear & Astrophysics.

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| PH6CRT12 | Solid State Physics |
|----------|---------------------|

- 1 This course will expose students to the basic concepts in solid state physics, along with relevant experimental details
- 2 By the end of this course students will be able to appreciate the physics of metals, semiconductors and insulators and various crystal lattices
- 3 This study attempts to explain various types of phenomena like electromagnetic properties, super-conductivity and it introduces theoretical framework such as BCS theory of Superconductors
- 4 students should obtain skills in experimental methods.

Choice based

#### PH6CBT01: INFORMATION TECHNOLOGY

- 1 To learn about the fascinating world of information technology

- 2 To practice the students to use the tools available in Internet and the World Wide Web for a deep study of the subjects related to physics in better way by the students themselves.
- 3 Provide an insight to computer hardware and computer applications is given by this course
- 4 Review the current topics in Internet technologies.

#### PH5OPT01: Our Universe

To course help the students to comprehend the cosmos and its origin  
The course aim to develop scientific attitude and aptitude among students

- Understand the Observational Astronomy.
- Understand the solar system.

#### PH5OPT02: Physics in Daily Life

this course looks at everyday applications of physics  
The course will look at the physics behind several everyday phenomena like reflection refraction etc  
The course would form a good basic physics knowledge for students studying other than physics  
understanding the universe

### COMPLEMENTARY PHYSICS FOR MATHEMATICS

#### PH1CMT01: PROPERTIES OF MATTER & ERROR ANALYSIS

- 1 Develop a theoretical knowledge among students about varies properties of matter
- 2 The course also aims at emphasizing the importance of measurement which is critical of physics.
- 3 Students should sensing the properties like Elasticity, surface Tension & viscosity & its practical significance.
- 4 This course would empower the student to acquire engineering skills and practical knowledge, which help the student in their everyday life.

#### PH2CMT01: MECHANICS AND ASTROPHYSICS

- 1 Develop a theoretical knowledge among students about Mechanics & Astro physics
- 2 Felicity to formulate and numerically solve problems.
- 3 Understand the formation, evolution, death and classification of stars,
- 4 This course would empower the student to acquire engineering skills and practical knowledge, which help the student in their everyday life.

#### PH3CMT01: MODERN PHYSICS AND ELECTRONICS

this course aim to Study the various atom models.  
Understand the important features of the quantum mechanics.  
This course is intended to introduce basic principles of spectroscopy .  
This course is expected to provide necessary back ground of  
digitalelectronics.

**PH4CMT01: OPTICS & ELECTRICITY**

- 1 This course offer a strong foundation in optics and electricity.
- 2 students should have gained knowledge of wave properties of light.
- 3 prepare the students for the study of advanced topics like lasers & fiber optics
- 4 students will be able to develop practical skills based on optical and electrical experiments

**COMPLEMENTARY PHYSICS FOR CHEMISTRY**

**PH1CMT01: PROPERTIES OF MATTER & THERMODYNAMICS**

- 1 Develop a theoretical knowledge among students about varies properties of matter
- 2 This course puts the concepts of thermodynamics on a firm foundation of laws of thermodynamics
- 3 Students should sensing the properties like Elasticity, surface Tension & viscosity & its practical significance.
- 4 This course would empower the student to acquire engineering skills and practical knowledge, which help the student in their everyday life.

**PH2CMT01: MECHANICS AND SUPERCONDUCTIVITY**

- 1 Develop a theoretical knowledge among students about Mechanics & Astro physics
- 2 Felicity to formulate and numerically solve problems.
- 3 Aim to introduce basics of supperconductivity and familiarize them with varies Applications of Superconductivity
- 4 This course would empower the student to acquire engineering skills andpractical knowledge, which help the student in their everyday life.

**PH3CMT01: MODERN PHYSICS AND MAGNETISM**

this course aim to Study the various atom models.  
Understand the important features of the quantum mechanics.  
This course is intended to introduce basic principles of spectroscopy .  
This course is intended to provide an introduction to properties of magnetic materials

**PH4CMT01: OPTICS & SOLID STATE PHYSICS**

- 1 This course offer a strong foundation in wave properties of light.

- 2 students should have gained knowledge in the field of optics, Laser& fiber optics
- 3 Students will learn about fundamentals of crystallography,
- 4 students will be able to develop practical skills based on optical and electrical experiments

Vocational

VOCATIONAL COURSES: (2)COMPUTER APPLICATIONS

CA1VOT01 Computer Fundamentals

- 1 This course provides the basic knowledge about computers
- 2 Acquire the foundation level knowledge required to understand computer and its operations.
- 3 Understand the hardware and software components of the computer. and computer languages
- 4 developing affinity among students to use modern technologies

PH1B22U Operating System and Computer Networks

- 1 Students acquire knowledge about various operating systems.
- 2 This course also provides a basic knowledge about the role of Operating System in the functioning of computers and potential of networks
- 3 students get chance to work in MSDOS, Windows, Unix and Linux platforms.
- 4 To provide knowledge of various networking technologies and its applications.

PH2B21U Word and Data Processing –Packages

- 1 To provide the detailed knowledge of Word and data processing software's.
- 2 To develop proficiency in documentation.
- 3 provide an Introduction to Business Data Processing
- 4 Understand to use the packages of word processing, spreadsheet and presentation in detail.

PH2B22U Programming Language - 1 – ANSI C

- 1 students train to Analyze a given problem and develop an algorithm to solve the problem
- 2 To gain the skills of Programming and to learn the programming concepts in C language.
- 3 students are able to Write, compile and debug programs in C language.
- 4 Design programs involving decision structures, loops and functions.



PH3B21U

Concepts Of Object Oriented Programming

- 1 To provide sound knowledge in object oriented programming.
- 2 Understand fundamental constructs of OOP.
- 3 To demonstrate the differences between traditional imperative design and object-oriented design
- 4 Ability to develop applications using Object Oriented Programming Concepts

PH3B22U

C++ Programming

- 1 This course is expected to provide sound knowledge in C++ programming
- 2 To gain the skills of Programming and to learn the programming concepts in C++
- 3 To explain class structures as fundamental, modular building blocks
- 4 To write small/medium scale C++ programs with simple graphical user interface

PH4B21U

Visual Basic Programming

- 1 To provide basic ideas of VB programming.
- 2 Explore Visual Basic's Integrated Development Environment (IDE).
- 3 Implement syntax rules in Visual Basic programs.
- 4 Explain variables and data types used in program development.

PH 4B22U

Computer Web Applications and Graphics

- 1 This course is expected provide training in graphic packages and its applications in web page designing
- 2 To provide basic ideas of HTML, JavaScript and MYSQL.
- 3 Understand, analyze and create web pages using HTML
- 4 Students get Introduction to web graphics, Tools used for web graphics (Photoshop, flash, fireworks etc..)