

# **B.Sc Physics (CBCSS UG 2019)**

## **Course Outcomes**

### **1. PHY 1 B01: MECHANICS – I**

**CO1:** Understand and apply the basic concepts of Newtonian Mechanics to Physical systems

**CO2:** Understand and apply the basic idea of work-energy theorem to physical systems

**CO3:** Understand and apply the rotational dynamics of rigid bodies

### **2. PHY 2 B02: MECHANICS – II**

**CO1:** Understand the features of non-inertial systems and fictitious forces

**CO2:** Understand and analyze the features of central forces with respect to planetary forces

**CO3:** Understand the basic ideas of Harmonic Oscillations

**CO4:** Understand and analyze the basic concepts of wave motion

### **3. PHY3B03: ELECTRODYNAMICS I**

**CO1:** Understand and apply the fundamentals of vector calculus

**CO2:** Understand and analyze the electrostatic properties of physical systems

**CO3:** Understand the mechanism of electric field in matter.

**CO4:** Understand and analyze the magnetic properties of physical systems

**CO5:** Understand the mechanism of magnetic field in matter.

### **4. PHY4B04: ELECTRODYNAMICS II**

**CO1:** Understand the basic concepts of electrodynamics

**CO2:** Understand and analyze the properties of electromagnetic waves

**CO3:** Understand the behavior of transient currents

**CO4:** Understand the basic aspects of ac circuits

**CO5:** Understand and apply electrical network theorems

### **5. PHY5B06: COMPUTATIONAL PHYSICS**

**CO1:** Understand the Basics of Python programming

**CO2:** Understand the applications of Python modules

**CO3:** Understand the basic techniques of numerical analysis

**CO4:** Understand and apply computational techniques to physical problems

### **6. PHY5B07: QUANTUM MECHANICS**

**CO1:** Understand the particle properties of electromagnetic radiation

**CO2:** Describe Rutherford - Bohr model of the atom

**CO3:** Understand the wavelike properties of particles

**CO4:** Understand and apply the Schrödinger equation to simple physical systems

**CO5:** Apply the principles of wave mechanics to the Hydrogen atom

### **7. PHY5B08: OPTICS**

**CO1:** Understand the fundamentals of Fermat's principles and geometrical optics

**CO2:** Understand and apply the basic ideas of interference of light

**CO3:** Understand and apply the basic ideas of diffraction of light

**CO4:** Understand the basic ideas of polarization of light

**CO5:** Describe the basic principles of holography and fibre optics

### **8. PHY5B09: ELECTRONICS (ANALOG & DIGITAL)**

**CO1:** Understand the basic principles of rectifiers and dc power supplies

**CO2:** Understand the principles of transistor

**CO3:** Understand the working and designing of transistor amplifiers and oscillators

**CO4:** Understand the basic operation of Op -Amp and its applications

**CO5:** Understand the basics of digital electronics

### **9. PHY6B10: THERMODYNAMICS**

**CO1:** Understand the zero and first laws of thermodynamics

**CO2:** Understand the thermodynamics description of the ideal gas

**CO3:** Understand the second law of thermodynamics and its applications

**CO4:** Understand the basic ideas of entropy

**CO5:** Understand the concepts of thermodynamic potentials and phase transitions

### **10. PHY6B11: STATISTICAL PHYSICS, SOLID STATE PHYSICS, SPECTROSCOPY & PHOTONICS**

**CO1:** Understand the basic principles of statistical physics and its applications

**CO2:** Understand the basic aspects of crystallography in solid state physics

**CO3:** Understand the basic elements of spectroscopy

**CO4:** Understand the basic ideas of microwave and infrared spectroscopy

**CO5:** Understand the fundamental ideas of photonics

### **11. PHY6B12: NUCLEAR PHYSICS AND PARTICLE PHYSICS**

**CO1:** Understand the basic aspects of nuclear structure and fundamentals of radioactivity

**CO2:** Describe the different types of nuclear reactions and their applications

**CO3:** Understand the principle and working of particle detectors

**CO4:** Describe the principle and working of particle accelerators

**CO5:** Understand the basic principles of elementary particle physics

### **12. PHY6B13: RELATIVISTIC MECHANICS AND ASTROPHYSICS**

- CO1:** Understand the fundamental ideas of special relativity
- CO2:** Understand the basic concepts of general relativity and cosmology
- CO3:** Understand the basic techniques used in astronomy
- CO4:** Describe the evolution and death of stars
- CO5:** Describe the structure and classification of galaxies

### **13. PHY6B14 (EL3): MATERIALS SCIENCE**

- CO1:** Understand the basic ideas of bonding in materials
- CO2:** Describe crystalline and non-crystalline materials
- CO3:** Understand the types of imperfections and diffusion mechanisms in solids
- CO4:** Describe the different properties of ceramics and polymers
- CO5:** Describe the different types of material analysis techniques

### **14. PHY4B05: PRACTICAL I**

- CO1:** Apply and illustrate the concepts of properties of matter through experiments
- CO2:** Apply and illustrate the concepts of electricity and magnetism through experiments
- CO3:** Apply and illustrate the concepts of optics through experiments
- CO4:** Apply and illustrate the principles of electronics through experiments

### **15. PHY6B15: PRACTICAL II**

- CO1:** Apply and illustrate the concepts of properties of matter through experiments
- CO2:** Apply and illustrate the concepts of electricity and magnetism through experiments
- CO3:** Apply and illustrate the concepts of optics and spectroscopy through experiments
- CO4:** Apply and illustrate the principles of heat through experiments

### **16. PHY6B16: PRACTICAL III**

- CO1:** Apply and illustrate the principles of semiconductor diode and transistor through experiments
- CO2:** Apply and illustrate the principles of transistor amplifier and oscillator through experiments
- CO3:** Apply and illustrate the principles of digital electronics through experiments
- CO4:** Analyze and apply computational techniques in Python programming

### **Open Course**

### **PHY5D01(2): AMATEUR ASTRONOMY AND ASTROPHYSICS**

- CO1:** Describe the history and nature of astronomy as a science
- CO2:** Understand the motion of earth in space and the cause of seasons
- CO3:** Understand the basic elements of solar system

**CO4:** Understand the elementary concepts of solar system