

Department of Physics

Preamble:

The systematic and planned curricula from these courses shall motivate and encourage learners to understand basic concepts of Physics.

Objectives:

1. To develop analytical abilities towards real world problems
2. To familiarize with current and recent scientific and technological developments
3. To enrich knowledge through problem solving, hands on activities, study visits, projects etc.

F.Y.B.Sc. PHYSICS Syllabus (General Outline)

To be implemented from the Academic Year 2021 - 2022.

Course Code	Title	Credits
	<u>Semester I</u>	
SBSPHY101	Classical Mechanics and Optics	2
SBSPHY102	Modern Physics	2
SBSPHY103	Practical I	2
		<u>Total= 06</u>
	<u>Semester II</u>	
SBSPHY201	Mathematical Physics	2
SBSPHY202	Electricity and Electronics	2
SBSPHY203	Practical II	2
		<u>Total = 06</u>

SEMESTER I
SBSPHY101 Classical Mechanics and Optics

Learning Outcomes:

On successful completion of this course students will be able to:

1. Understand Newton's laws and apply them in calculations of the motion of simple systems.
2. Use the free body diagrams to analyze the forces on the object.
3. Understand the concepts of friction and the concepts of elasticity, fluid mechanics and be able to perform calculations using them.
4. Understand the concepts of lens system and interference.
5. Apply the laws of thermodynamics to formulate the relations necessary to analyze a thermodynamic process.
6. Demonstrate quantitative problem-solving skills in all the topics covered.

Unit: I

15 lectures

1. Newton's Laws:
2. Elasticity
3. Fluid Dynamics

Unit: II

15lectures

1. Lens, Equivalent Focal Length of two thin lenses, Eyepiece
2. Aberration
3. Interference

Unit: III

15 lectures

1. Behavior of real gases
2. Thermodynamics

SEMESTER - I
SBSPHY102 Modern Physics

Learning Outcomes:

After successful completion of this course students will be able to

1. Understand nuclear properties and nuclear behavior.
2. Understand the type isotopes and their applications.
3. Demonstrate and understand the quantum mechanical concepts.
4. Demonstrate quantitative problem-solving skills in all the topics covered.

Unit I

15 lectures

1. Structure of Nuclei
2. Radioactivity
3. Carbon Dating

Unit II

15 lectures

1. Interaction of Gamma rays with Matter
2. Nuclear Reactions
3. Fusion & Fission

Unit III

15 lectures

1. Origin of Quantum theory
2. X-Rays production and properties
3. Interaction of radiation with living system

SEMESTER II

SBSPHY201 (Mathematical Physics, Electricity & Electronics)

Learning Outcomes:

On successful completion of this course students will be able to:

1. Understand the basic mathematical concepts and applications of them in physical situations.
2. Demonstrate quantitative problem-solving skills in all the topics covered
3. A thorough quantitative and conceptual understanding of the core and interdisciplinary areas of physics. The ability to communicate scientific results effectively in presentations or posters.

Unit I

15 lectures

1. Vector Algebra
2. Differential equations

Unit: II

15 lectures

1. Alternating current theory
2. AC bridges

Unit: III

15 lectures

1. Circuit theorems
2. DC power supply
3. Digital electronics

SEMESTER II

SBSPHY202 (Analog Electronics, Electricity and Applied Physics)

Learning Outcomes:

1. The ability to analyze and interpret quantitative results, both in the core areas of physics and interdisciplinary areas.
2. The ability to use contemporary experimental apparatus and analysis tools to acquire, analyze and interpret scientific data.
3. The ability to apply the principles of Physics to solve new and unfamiliar problems.

Unit I:

15 lectures

1. Transistor Biasing
2. General amplifier characteristics

Unit II:

15 lectures

1. The Electric Field
2. Work and Energy in Electrostatics
3. Magnetostatics
4. The Biot Savart Law

Unit III:

15 lectures

1. Introduction to Materials
2. Types of Materials
3. Properties of materials: Electrical, Optical & Magnetic Properties