



PROGRAM AND COURSE OUTCOMES

DEPARTMENT OF PHYSICS



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BSc PHYSICS

Program Outcomes

- Understand the scientific method to approach problems. Inculcate scientific aptitude. Understand the history of development of physics up to modern age.
- Understand the basic concepts of fundamentals of mechanics, properties of matter and electrodynamics
- Understand the theoretical basis of quantum mechanics, relativistic physics, nuclear physics, optics, spectroscopy, solid state physics, astrophysics, statistical physics, photonics, and thermodynamics
- Understand and apply the concepts of electronics in the designing of different analog and digital circuits
- Understand the basics of computer programming and numerical analysis
- Apply and verify theoretical concepts through laboratory experiments

Course Outcomes

Semester	Course	Course Outcome
1	Methodology of Science and Physics	<ul style="list-style-type: none">• Understand the features, methods, and limitations of science. Inculcate scientific aptitude. Understand the basic mathematical tools. Understand• The history of development of physics up to modern age.
2.	Properties of Matter, Waves and Acoustics.	<ul style="list-style-type: none">• Understand the properties of matter and the formation of waves and its properties.• Apply the linear acoustic wave equation and explain the relationship between pressure and particle velocity for plane waves and spherical waves
3.	Mechanics	<ul style="list-style-type: none">• Understand and apply the basic concepts of Newtonian Mechanics to physical systems.• Understand and apply the basic idea of work-energy theorem to physical systems.
4	Electrodynamics	<ul style="list-style-type: none">• Understand and analyze the electrostatic properties of physical systems.• Understand the mechanism of electric field in matter.• Understand and analyze the magnetic properties of physical systems• Understand the mechanism of magnetic field in matter
4	Practical-I	<ul style="list-style-type: none">• Apply the concepts learned in 4 semesters by performing experiments systematically. Analyze the results and identifies the procedural errors and verify the theoretical concepts.

5	Electrodynamics II	<ul style="list-style-type: none"> • Understand the basic concepts of electrodynamics. • Understand and analyze the properties of electromagnetic waves. • Understand the behaviour of transient currents. • Understand the basic aspects of ac circuits • Understand and apply electrical network theorems.
	Quantum Mechanics	<ul style="list-style-type: none"> • Understand the particle properties of electromagnetic radiation. • Describe Rutherford – Bohr model of the atom. • Understand the wavelike properties of particles. • Understand and apply the Schrödinger equation to simple physical systems. • Apply the principles of wave mechanics to the Hydrogen atom.
	Physical Optics and Modern Optics	<ul style="list-style-type: none"> • Understand the fundamentals of Fermat’s principles and geometrical optics. • Understand and apply the basic ideas of interference of light. • Understand and apply the basic ideas of diffraction of light. • Understand the basics ideas of polarization of light. • Describe the basic principles of holography and fiber optics.
	Electronics (Analogue and Digital)	<ul style="list-style-type: none"> • Understand the basic principles of rectifiers and dc power supplies. • Understand the principles of transistor. • Understand the working and designing of transistor amplifiers and oscillators. • Understand the basic operation of Op – Amp and its applications. • Understand the basics of digital electronics
6	Thermal and Statistical Physics	<ul style="list-style-type: none"> • Understand the zero and first laws of thermodynamics • Understand the thermodynamical description of the ideal gas. • Understand the second law of thermodynamics and its applications. • Understand the basic ideas of entropy. • Understand the concepts of thermodynamic potentials and phase transitions.
	Solid State Physics, Spectroscopy and Laser physics	<ul style="list-style-type: none"> • Understand the basic principles of statistical physics and its applications. • Understand the basic aspects of crystallography in solid state physics. • Understand the basic elements of spectroscopy. • Understand the basics ideas of microwave and infra-red spectroscopy.
	Nuclear Physics, Particle	<ul style="list-style-type: none"> • Understand the basic aspects of nuclear structure

Physics and Astrophysics	<ul style="list-style-type: none"> and fundamentals of radioactivity. • Describe the different types of nuclear reactions and their applications. • Understand the principle and working of particle detectors and particle accelerators. • Understand the basic principles of elementary particle physics.
Material Science	<ul style="list-style-type: none"> • Understand the basic ideas of bonding in materials. • Describe crystalline and non-crystalline materials. • Understand the types of imperfections and diffusion mechanisms in solids. • Describe the different properties of ceramics and polymers. • Describe the different types of material analysis techniques.
Practical _Paper-II	<ul style="list-style-type: none"> • Apply the concepts learned in 4 semesters by performing experiments systematically. Analyze the results and identifies the procedural errors and verify the theoretical concepts.
Practical-Paper-III	<ul style="list-style-type: none"> • Apply the concepts learned in Analog and Digital electronics by performing experiments systematically. Analyze the results and identifies the procedural errors and verify the theoretical concepts.
Project	<ul style="list-style-type: none"> • Understand research methodology • Understand and formulate a research project. • Design and implement a research project
Study Tour	<ul style="list-style-type: none"> • Identifies the various applications of the concepts they have learned. Understand to prepare report.