Course: B. Sc. Physics
Program/ Course Outcomes
B.Sc. PHYSICS

PROGRAMME SPECIFIC OUTCOMES:

This undergraduate course in Physics Would provide the opportunity to the students:

- To understand the basic laws and explore the fundamental concepts of physics
- To understand the concepts and significance of the various physical phenomena.
- To carry out experiments to understand the laws and concepts of Physics.
- To apply the theories learnt and the skills acquired to solve real time problems.
- To acquire a wide range of problem solving skills, both analytical and technical and to apply them.
- To enhance the student's academic abilities, personal qualities and transferable skills this will give them an opportunity to develop as responsible citizens.
- To produce graduates who excel in the competencies and values required for leadership to serve a rapidly evolving global community.
- To motivate the students to pursue PG courses in reputed institutions.
- This course introduces students to the methods of experimental physics. Emphasis will be given on laboratory techniques specially the importance of accuracy of measurements.
- Providing a hands-on learning experience such as in measuring the basic concepts in properties of matter, heat, optics, electricity and electronics

Core Papers:
B.Sc. 1st Year

DSC1: Mechanics :(PHYS101TH)

The students would learn about the behaviour of physical bodies it provides the basic concepts related to the motion of all the objects around us in our daily life. The course builds a foundation of various applied field in science and technology; especially in the field of mechanical engineering. The course comprises of the study vectors, laws of motion, momentum, energy, rotational motion, gravitation, fluids, elasticity and special relativity.

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DSC1 LAB :(PHYS101 PR)

Students would perform basic experiments related tomechanics and also get familiar with various measuring instruments would learn the importance of accuracy of measurements.

DSC2: Electricity and Magnetism:(PHYS102TH)

It gives an opportunity for the students to learn about one of thefundamental interactions of electricity and magnetism, both as separate phenomena and as a singular electromagnetic force. The course contains vector analysis, electrostatics, magnetism, electromagnetic induction and Maxwell's equations. The course is very useful for the students in almost every branch of science and engineering.

DSC2 LAB:(PHYS102 PR)

Students would gain practical knowledge about electricity and magnetism and measurements such as: Resistance, Voltage, current etc.

B.Sc. 2nd Year

DSC3: Thermal Physics and Statistical Mechanics:(PHYS201TH)

The course makes the students able to understand the basic physics of heat and temperature and their relation with energy, work, radiation and matter. The students also learn how laws of thermodynamics are used in a heat engine to transform heat into work. The course contains the study of laws of thermodynamics, thermodynamic description of systems,thermodynamic potentials, kinetic theory of gases, theory of radiation and statistical mechanics.

DSC3 LAB:(PHYS201 PR)

Students would gain practical knowledge about heat and radiation, thermodynamics, thermo emf, RTD etc. and perform various experiments.

DSC4: Wave and Optics:(PHYS202 TH)

The course comprises of the study of superposition of harmonic oscillations, waves motion (general), oscillators, sound, wave optics, interference, diffraction, polarization. The course is important for the students to make their career in various branches of science and engineering, especially in the field of photonic engineering.

DSC4 LAB: :(PHYS202 PR)

The practical knowledge of wave motion doing experiments: Tuning fork, electric vibrations. They would also learn optical phenomena such as interference, diffraction and dispersion and do experiments related to optical devices: Prism, grating, spectrometers.

SEC1: Physics Workshop Skill:(PHYS203 TH)

The students would gain the knowledge of various mechanical skills like casting, machining, cutting tools, welding, use of multimeter, soldering of electrical circuits, fixing of gears with axle.

SEC2 Electrical Circuits & Network Skill:(PHYS205 TH)

The students would gain the knowledge of understanding electrical circuits, voltage, current, insulation, single-phase, three-phase, dc motor, Electrical circuits ,Electrical drawing and symbols etc.

Discipline Specific Elective papers(any two):

DSE1B: Nuclear and Particle Physics(PHYS601 TH)

Students would know about the basic principles in the development of modern physics. The topics covered in the course build a basicfoundation of undergraduate physics students to study the advance branches: quantum physics, nuclear physics, particle physics and high energy physics. The course contains the study of Planck's hypothesis, photoelectric effect, Compton effect, matter waves, atomic models, Schrodinger wave equations, and brief idea of nuclear physics.

DSE1A: Solid State Physics& Electronics: (PHYS302TH)

Students would be able to understand various types of crystal structures and symmetries and understand the relationship between the real and reciprocal space and learn the Bragg's X-ray diffraction in crystals. Would also learn about phonons and lattice. The course Provides practical knowledge of various physical phenomena such as: magnetism, dielectrics, ferroelectrics and semiconductors. Students would gain a hands-on learning experience by performing experiments on these properties of materials. In Electronics The students would gain the knowledge of Basic Electronics circuits, network theorems and measuring instruments: They

would know about common solid state devices: Semiconductor diodes and transistors. The topics also include the Rectifiers, Filters and their applications.

DSE1A: Solid State Physics & Electronics: (PHYS302 PR)
Students would learn about electronic circuits such as Amplifiers and Oscillators. Various types of Amplifier and Oscillator circuits their working and applications in domestic, industrial and scientific devices/equipments.

SEC1: Radiation and Safety: (PHYS307 TH)

The students would gain the knowledge of different types of radiation and its interactions with matter, would also know about the photons, charged particles, neutrons, about radiation detection, monitoring and safety measures, and also learn about the applications of nuclear techniques.

SEC2: Renewable energy & Energy Harvesting: (PHYS310 TH)

In this course students understand the basic need of the hour i.e. various types of renewable energy resources like Solar energy, Wind Energy, Ocean Energy, Tidal energy, how energy can be transferred from one form to another, various modes in which energy can be harvested.

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