

Physics department
South east Manipur college
Programme Specific outcome(PSO)

Our physics department Officers six semester undergraduate courses in Honours and general under Manipur University , Canchipur , Imphal (Manipur) prescribed by UGC, India. Any student may choose either Honours or General Course in physics as a subsidiary subject.

Science is knowledge which is gained in a systematic, organised and formulated knowledge through the experimental observation systematic knowledge gained through sense organs and that acquired with the help of instrument of microscopic fineness and accuracy .

Physics is natural science . In study of natural science , two main branches are subdivided namely physical sciences and Biological sciences. According the word physical, physics is a natural science. Many people believed that they lived on a stationary earth , which itself is situated at the centre of the universe. We being the most intelligent worker in nature's laboratory for taking the knowledge about nature and the world around him. The major endeavour of man is science . A scientific theory is a setup that helps to explain a natural phenomenon or the behaviour of natural system on the basis of the established the laws of nature .

Now-a-days the society in which the science is fully develop is also much advanced in the field of technology. But in standing of physical science mathematics is the most powerful tool.

In physics the different aspect of the phenomena , like mechanics thermodynamics electromagnetism, sound, optics, Relatively , condensed matter (physics of materials) electronics, mathematical physics etc. Now , we mainly come to the nano ages in science and technology.

In completion of Bsc Course in Physics students learn the different branches of physics in theoretical , applications and also equipped for practical observations. . The Honours course in physics students eligible for the further studies mainly post graduate studies in physics and electronics

Course Specific Outcome (CSO)

Three years Degree Course in physics Honours . We treated the following branches of physics in detail.

1. Mechanics:- the theory of motion of material objects are learned in macroscopic world Newtonian formulation work energy theorem gradient of potential energy rotational dynamics gravitation are mainly discussed.
2. Oscillatory motion is learned in different topics namely motion of simple and compound pendulum , harmonic oscillator, free oscillations, principal of super position.
3. In theory of relatively course, students learn Michelson –morely experiment and its outcome, postulates of special theory of relativity, Lorentz transformations, Lorentz contraction and time dilation, Einstein's theory of mass –energy relation , Doppler effect, transformer of energy and momentum, Relativistic transformation of velocity, relativistic kinematics
4. In thermal physics, thermodynamics , kinetic theory of gases and radiation are discussed .Students learned Laws of thermodynamics, carnot theorem, thermodynamics scale, Ehrenfest's equation, Thomson-effect, Brownian motion, equation of state, Ideal gas equation , van der-waal's equation, critical constants, Laws of corresponding states, blackbody radiation, Wien's displacement law, Rayleigh- Jean's law, Ultra violet catastrophe, derivation of planck's radiation law.
5. In optics, ray optics and wave optics are studied. The different topics are Interference in thin films, Fringes of equal thickness and equal inclination, theory of Newton's rings, Michelson's

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interferometer and Fabry-Perot interferometer are learned. Moreover Diffraction, difference of interference and diffraction, theory of Plane diffraction grating, resolving power and dispersive power of a plane diffraction grating, Fresnel's integrals, Cornu's spiral, Fresnel diffraction pattern at a straight edge.

Polarization of light- polarization by reflection, double refraction, wave surface at uniaxial crystal, production and detection of elliptically and circularly polarized light, Babinet's compensator – theory and uses, optical activity and polarimeter are discussed.

In elements of Quantum Optics – stimulated emission, population inversions, Einstein's Coefficients, different types of Lasers, Elements of second harmonic generation also learned.

6. In Electricity and Magnetism – students learn the basic mathematical tools like vector-scalar fields, divergence and gradient of vector field, curl and circulation of vector field, Laplacian Operator, Gauss's Theorem, Stoke's Theorem and Green's Theorem.

The different concepts of Electric field, Magnetic field and electromagnetic induction are also discussed.

7. In Atomic and Nuclear physics, students learned the different ideas of mass-spectrographs and x-rays, Atomic Spectra, Radioactivity. In advantage of learning in Particle accelerator-linear accelerator, cyclotron, Betatron, Synchrotron are included.

Nuclear detectors, Nuclei and its properties Nuclear models and reactions are learned.

8. Electronics studied the basic circuit analysis, Semiconductor diodes, Bio-polar junction transistors, field-effect-transistor, Amplifiers, Oscillators and Digital circuits.

9. Mathematical Physics are applied on the different terms of complex variables, functions of complex variable, special functions, partial differential equations, Fourier Series.

10. Origin of Quantum theory references to radiation spectrum, Planck's hypothesis, Einstein's idea, photoelectric effect, Compton effect, Franck-Hertz experimental, Bohr's postulate, Bohr-sommerfeld quantization rule, De-Broglie wave,

Davisson Germer Experiment, electron and neutron diffraction, development of quantum mechanics, different concepts of Basic postulates and formalism, stationary states and energy eigen states, particle in one-dimensional potential barrier and hydrogen atom are learned.

11. Physics of materials (solid state physics) are largely concerned with crystals and electrons in crystals. Honours students learned the different steps of crystal structure, Electrical properties of materials, magnetic properties of materials, Lattice dynamics, super conductivity, physics of low dimension likely density of states, different types of nanomaterials, Blue shifting, application of nanoscience.

The above mention courses are now the largest and probably the most vigorous area of physics.

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