

SYLLABUS



Proposed course outlines
For
BS Physics (General Course other Than BS Physics)
Effective from the Academic Session 2019 onward

DEPARTMENT OF PHYSICS, UNIVERSITY OF BALOCHISTAN, QUETTA

PHY-600	Physics (General Course other than BS Physics)	3(3-0)
----------------	---	---------------

OBJECTIVE

To study the main concepts of Physics.

CONTENTS

- 1- Properties of Matter:** Matter and its states; solid: types of solids, crystals, unit cell, crystal structure, crystal systems; Fluids mechanics: Density, pressure and pascal's law, Buoyancy Archimedes principle, fluid flow, Bernoulli's equation.
- 2- Heat and Thermodynamics :** Gases: Kinetic theory of gases, Temperature and Pressure of gas, ideal gas equation, general gas laws (Boyle's law, Charles's law), Heat, Transmission of heat (conduction, convection, radiation), Latent heat, Heat capacity. Internal energy of a system and first Law of thermodynamics.
- 3- Electricity and Magnetism.:** Electric charge, Coulomb's law, Electric field, Electric potential, Electric field as a potential gradient, Electric potential due to Point charge, Capacitors: Capacitance; Calculation of Capacitance of Parallel Plate; Storage of Electrical Energy in a Capacitor; Capacitor with a Dielectric; Electric polarization; Electric flux and Gauss's Law, Electromagnetism, magnetic field due to current carrying conductor, Magnetic flux and flux density, Ampere's law.
- 4- Modern Physics:** Special theory of relativity: Black body radiation, Plank's Quantum theory Photoelectric and Compton Effect. Concept of photon, Dual nature of light, Wave Nature of Matter. De Broglie hypothesis, Experimental Confirmation (Davisson-Germer and J.P. Thomson Experiments); wave particle Duality and Principle of complementarity, Heisenberg uncertainty principle, Atomic Physics: Atomic Spectra, Bohr's theory of Hydrogen Atom, Frank-Hertz experiment, Zeeman effect, energy levels of electron, Electron spin, X-ray production, x-ray spectrum (continuous and discrete); Nuclear Physics: Radioactivity, half-life, decay constant, mass deficit and binding energy, nuclear reactions, Fission and Fusion.

BOOKS RECOMMENDED

1. Fundamentals of Physics by David Halliday, Jearl Walker, and Robert Resnick 10th edition.
2. Sears and Zemansky's University Physics by H D Young and R A Freedman 13th edition.
3. Physics for Scientists and Engineers by D G Giancoli 3rd edition
4. Physics for Scientist and Engineers with Modern Physics by Raymond A Serway. 9th ed.
5. Physics for Scientists and Engineers by Paul A Tipler 4th edition.
6. Modern Engineering Physics by A S Vasudava.