



Code	Subject Title	Cr. Hrs	Semester
PHY-213	Physics-IV (Concepts of Modern Physics)	3	IV
Year	Discipline		
2	Chemistry-II, Mathematics-I, Statistics-I		

**Quantum Physics:**

Thermal Radiations (Black body radiation); The quantization of Energy; The Photoelectric effect; Einstein's photon theory; The Compton effect; Line Spectra.

**Wave Nature of Matter:**

Wave behavior of particles; Testing De Broglie's hypothesis; Waves, Wave packets and particles; Heisenberg's uncertainty principle (HUP); Wave Function; Schrödinger Equation.

**States and Energy Levels:**

Trapped Particles and Probability; Densities; The correspondence principles; Dual nature of matter (waves & particles)

**Atomic and Nuclear Physics Atomic Structure of Hydrogen:**

Bohr's Theory; Angular Momentum of Electrons; Electron Spin; X-ray Spectrum; X-Ray & Atomic number; Development of periodic table; Laser.

**Nuclear Physics:**

Discovering the nucleus; Some nuclear properties; Radioactive decay; Alpha decay; Beta decay; Measuring ionizing radiation (Units); Natural Radioactive; Nuclear Reactions; Energy from the nucleus; Nuclear fission; Nuclear Reactors; Thermonuclear Fusion (T.N.F.); Controlled Thermonuclear Fusion.

**Practical Paper:**

Mechanics, Thermodynamics, Sound, Optics and Electricity or Magnetism:

**Special theory of Relativity:**

Trouble with classical Mechanics; Postulates of Relativity; The Lorentz Transformation inverse transformation Consequences of Lorentz transformation; Relativistic momentum; Relativistic energy.

**Recommended Books:**

1. Physics Vol. I & II (extended) by Resnick, Halliday and Karne, 4<sup>th</sup> and Sons Inc, New York
2. Fundamentals of Physics by Halliday Resnick and Krane, John Wiley and Sons Inc, New York.
3. University Physics 8<sup>th</sup> Edition by Sears, Zemansky and Young, Addison – Wesley, Reading (MA), USA.
4. Physics by Alonso and Finn; Addison-Wesley, Reading (MA) USA.