

## BS (4 Years) for Affiliated Colleges



Code	Subject Title	Cr. Hrs	Semester
<b>PHY-403</b>	<b>NUCLEAR PHYSICS-I</b>	<b>3</b>	<b>VII</b>
Year	Discipline		
<b>4</b>	<b>Physics</b>		

### Course Outlines:

Basic Properties of Nucleus: Size and mass of the nucleus, nuclear spin, magnetic dipole moment, electric quadrupole moment, parity and nuclear statistics.

Detectors: Passage of charged particles through matter, ionisation chamber, proportional counter, scintillation counter, semi-conductor detector, emulsion technique, bubble chamber, Particle Accelerators: Linear and orbital accelerators, Van de Graff, betatron, synchrocyclotron, proton synchrotron.

Radio-Active Decay: Theory of alpha decay, and explanation of observed phenomena, measurement of  $\beta$ -ray energies, the magnetic lens spectrometer, Fermi theory of  $\beta$ -decay, neutrino hypothesis, theory of gamma decay, multipolarity of gamma-rays, nuclear isomerism.

Nuclear Forces: Yukawa theory, proton-proton and neutron-proton scattering, charge independence and spin dependence of nuclear force, isotopic spin, Nuclear Models: Liquid drop model, shell model, collective model.

### **Books Recommended:**

1. *Nuclei and particles* by E. Serge, 1980.
2. *A Text Book of Nuclear Physics* by C.M.H. Smith, Pergamon Press Oxford, 1966.
3. *Nuclear Physics* by I. Kaplan, Addison-Wesley, 1980.
4. *Introductory Nuclear Physics* by Krane, 1980.
5. *Concepts of Modern Physics* by Beiser, 1980.