

## BS (4 Years) for Affiliated Colleges



Code	Subject Title	Cr. Hrs	Semester
<b>PHY-424</b>	<b>NUCLEAR PHYSICS-II</b>	<b>3</b>	<b>VIII</b>
Year	Discipline		
<b>4</b>	<b>Physics</b>		

### Course Outlines:

**Nuclear Models:** Liquid drop model, shell model, collective model. **Nuclear Reactions:** Conservation laws of nuclear reactions, Q-value of nuclear reaction, threshold energy, transmutation by photons, protons, deuterons and alpha particles, excited states of nucleus, energy levels, level width, Cross section from nuclear reactions, compound nucleus theory of nuclear reactions, limitations of compound nucleus theory, resonances, Breit-Wigner formula, direct reactions.

**Neutron Physics:** Neutron sources, radioactive sources, photo neutron sources, charged particle sources, reactor as a neutron source, slow neutron detectors, fast neutron detectors, slowing down of neutron, nuclear fission, description of fission reaction, mass distribution of fission energy, average number of neutrons released, theory of fission and spontaneous fission.

**Thermonuclear Reactions:** Fusion and thermonuclear process, energy released in nuclear fusion, carbon nitrogen & oxygen cycle, controlled nuclear fusion, D-D & D-T reactions.

### **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.