

FOURTH SEMESTER THEORY
FPYC-401 MODERN PHYSICS

UNIT-I(7 HOURS)

Radioactivity and nuclear reactions: Introduction, radioactivity, exponential decay law, Beta decay and neutrino. Natural radioactive series, nuclear reactions, Accelerators: Van De Graph, Tandem, linear accelerator, cyclotron, Betatron.

UNIT-II(7 HOURS)

Lasers: purity of spectral line, coherence length and coherence time, Einstein's A and B coefficients, Types of emission, metastable state, population inversion, 3 and 4 level lasers and its application, ruby laser, He-Ne laser, semiconductor laser, uses of laser .

UNIT-III(8 HOURS)

Electron spin: Introduction, spin angular momentum, magnetic moments, Zeeman Effect, Spin magnetic moment, anomalous Zeeman effect, stark effect, fine structures, Magnetic Resonance Imaging.

UNIT-IV(8 HOURS)

Nano material: Introduction to nano materials, Basic principles of Nano science and technology, Fabrication of nano materials, Physical and chemical properties of nano materials, carbon nano tubes, application of nano technology.

Spectroscopy: IR and Raman spectroscopy, Photoemission and X-ray spectroscopy, Magnetic resonance.

Text Books

1. Modern physics, Arthur Beiser, TATA Mc graw Hill Edition
2. Modern physics for scientists and Engineers- John R. Taylor, Chris D. zafiratos, Michael A. Dubson. (Pearson)
3. Applied physics: P.K. palanisamy (Scitech)
4. Introduction to Nanotechnology- Charles P. Poole, Jr., Frank J. Owens (Wiley)
5. Atomic Molecular spectra and laser – Rajkumar.