

PHY5032 Nuclear Instrumentation

Course Code	PHY5032	Semester	
Course Title	<i>Nuclear Instrumentation</i>		
Credits	3	Type	Elective

Course Outcome

This course provides a comprehensive coverage of various instrumentation and techniques followed in Accelerator based Nuclear Physics Research. Detailed description of world class experimental facilities like accelerators, mass spectrometers etc provide opportunities to the student to learn cutting edge technologies used in modern physics research. This course is a pre-Ph D course work in majority of the laboratories across the world. The hands -on training in Nuclear Physics Lab along with the course improves the practical skills of the students. Technologies discussed in this course are used in multi-disciplinary subjects.

Course Structure

Contents: (1) Detectors: Solid state detector. Gas detector. Ionization chamber. Proportional counter. (2) Interaction of radiation with matter. Gamma detectors. Scintillators. Electron multipliers and micro-channel plated. (3) Particle identification techniques. Signal processing and data acquisition systems. Signal amplifiers. CAMAC, SCA and multi-channel analyzer. (4) Recoil spectrometers. Gas filled and vacuum spectrometers. Large array detector assemblies. (5) Accelerators: types and applications.

Suggested Books

1. G. F. Knoll, Radiation Detection and Measurements, Wiley (1979)
2. S. Tavernier, Experimental Techniques in Nuclear and Particle Physics, Springer (2010)