

PPH306: NUCLEAR PHYSICS LAB

L	T	P	Cr
0	0	3	1.5

Course Objectives: Aim of Nuclear Physics Lab is to train the students for advanced techniques in nuclear physics so that they can investigate various relevant aspects and be confident to handle sophisticated instruments of nuclear physics.

List of Experiments:

1. Dead time of a Geiger Muller (GM) Counter (Two source method)
2. Dead time of a Geiger Muller (GM) Counter (Absorber method)
3. To determine the operating voltage of a PMT and to find the photopeak efficiency of a NaI (Tl) crystal of given dimension for γ rays of different energies.
4. To calibrate a γ ray spectrometer and to determine the energy of a given gamma ray source
5. Pulse height γ ray spectrum of with multi channel analyser.
6. Energy resolution of a NaI(Tl) detector.
7. To verify the inverse square law with ^{137}Cs source.
8. To study the Compton scattering using γ rays of suitable energy.
9. To study the time resolution of a coincidence setup.
10. To determine γ ray attenuation coefficient for different metals.
11. To study the relationship between thickness of absorber and backscattering using GM counter.
12. To study the shielding effect of radiation penetrability.
13. To study anisotropy of γ ray cascade emission in ^{60}Co source.
14. To determine the half-life of a radioactive sample.

Course Learning Outcomes (CLO):

Students will have understanding of:

1. how to operate a GM counter?
2. how to find the absorption coefficient of different materials?
3. how to handle nuclear materials and nuclear safely management