

Semester	JAN 2022
Open to semester	6,12
Course code	<b>PH3244</b>
Course title	<b>Physics Lab IV</b>
Credits	4 /
Course Coordinator & participating faculty (if any)	Shivprasad Patil
Nature of Course	Lab
Pre-requisites	Physics courses in the 5th semester
Objectives (goals, type of students for whom useful, outcome etc)	<p>This lab course is meant for students interested in experimental physics. It aims to introduce a broad range of experimental techniques and critical experimental concepts routinely used in modern research laboratories like Lock-in amplifier etc. In short, this lab course offers some interesting experiments that a student frequently comes across during the lecture courses in advanced electrodynamics, quantum physics as well as nuclear and particle physics etc. Some of these experiments illustrate physics of the electromagnetic radiation, their propagation and interaction with matter. Other experiments are aimed to illustrate the quantum nature of interactions at the subatomic scales.</p> <p>All students are encouraged to understand the instrumentations and explore the physics behind these experiments using available tools/instruments. If possible, students must try something newer and better procedures than those already stated in the manuals. Additional credits will be given for these extra efforts.</p>
Course contents (details of topics /sections with no. of lectures for each)	<p>At least 8 experiments from the list must be completed.</p> <p>Thermionic Emission(2)  Field Emission(2)  Nuclear Counting Statistics(2)  Nuclear magnetic resonance(2)  Lock-in-Amplifier  Absorption spectroscopy(2)  Absorption/Attenuation of nuclear radiations(2)  Bremsstrahlung(2)  Generation and characterization of X-rays(1)  Electron Diffraction(2)</p>

	<p>Electron spin resonance(2) Normal Zeeman Effect(2)</p>
Evaluation /assessment	<p>End-Sem Examination-30% Mid-Sem Examination-20% Others-lab records 20 % continuous evaluation 30%%</p>
Suggested readings (with full list of authors, publisher, year, edn etc.)	<p>Text Book(s)</p> <ol style="list-style-type: none"> <li>1.The Art of Experimental Physics: D.W. Preston and E.R. Dietz (1991), John Wiley.</li> <li>2.An introduction to Error Analysis, John R. Taylor, University Science Books.</li> <li>3.Advanced Practical Physics: B.L. Worsnop and H.T. Flint, Asia Publishing House</li> <li>4.Analytical Experimental Physics: M. Farence Jr., H.B. Lemon and R. J. Stephenson (1970) University of Chicago Press.</li> <li>5.The Art of Electronics: P. Horowitz and W. Hill (1989) 2nd edition, Cambridge University Press.</li> </ol> <p>Additional Literature(s) on each experiments will be provided during the class.</p>