

PROFORMA FOR NEW COURSE

1.	Title of the Course	Foundation of Experimental Physics
2.	Course Number	PH7101
3.	Status of the Course	Core/Elective
4.	Structure of Credits	4-0-0-4
5.	Offered To	PG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Physics
8.	To take effect from	July 2019
9.	Prerequisite	Nil
10.	Whether approved by the Program	Yes
11.	Course Objective: To provide insight into a few important and broadly common experimental techniques in Physics.	
12.	Course Content: Scattering, spectroscopy, microscopy, and resonance techniques: X-ray and neutron scattering, electron microscopy, electron spin resonance, nuclear magnetic resonance, nuclear quadrupole resonance, muon spin rotation; Thermal characterization: different cryostats, vacuum technology, thermogravimetric analysis, differential thermal analysis, differential scanning calorimetry, specific heat, thermal expansion, thermal conductivity, transport and magnetic properties; Optics and spectroscopy: Laser cooling and trapping, Fabry-Perot interferometer, opto-galvanic spectroscopy, Doppler free spectroscopy, fluorescence spectroscopy, coherent spectroscopy, microwave spectroscopy, molecular beam spectroscopy, optical pumping; Plasma: Laboratory plasma generation techniques, optical diagnostic, electrical diagnostic, laser induced breakdown spectroscopy, identification and characterization of plasma produced radicals.	
13.	Text book(s): 1. Cullity B D and Stock S R, <i>Elements of X-Ray Diffraction</i> , Pearson (2001) 2. Moore J H, Davis C C and Coplan M A, <i>Building Scientific Apparatus</i> , Cambridge University Press (2009)	
14.	Reference(s): 1. Amelinckx S, Dyck D V, Landuyt J V and Tendeloo G V, <i>Handbook of Microscopy: Applications in Materials Science, Solid-State Physics, and Chemistry. Methods II</i> , Wiley (2008) 2. Chen F F and Chang J P, <i>Lecture Notes on Principles of Plasma Processing</i> , Springer (2003) 3. Enss C and Hunklinger S, <i>Low-Temperature Physics</i> , Springer (2005) 4. Saleh B E A and Teich M C, <i>Fundamentals of Photonics</i> , Wiley-Blackwell (2007)	