1.	Title of the course	Foundation of Experimental Physics
2.	Course number	PH702L
3.	Structure of credits	4-0-0-4
4.	Offered to	PG
5.	New course/modification to	Modification To PH7101/9
6.	To be offered by	Department of Physics
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** To provide insight into a few important and broadly common experimental techniques in Physics.	
10.	**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.	
11.	**Textbook(s):** 1. Cullity B D and Stock S R, *Elements of X-Ray Diffraction*, Pearson (2001). 2. Moore J H, Davis C C and Coplan M A, *Building Scientific Apparatus*, Cambridge University Press (2009).	
12.	**Reference(s):** 1. Amelinckx S, Dyck D V, Landuyt J V and Tendeloo G V, *Handbook of Microscopy: Applications in Materials Science, Solid-State Physics, and Chemistry. Methods II*, Wiley (2008). 2. Chen F F and Chang J P, *Lecture Notes on Principles of Plasma Processing*, Springer (2003). 3. Enss C and Hunklinger S, *Low-Temperature Physics*, Springer (2005). 4. Saleh B E A and Teich M C, *Fundamentals of Photonics*, Wiley-Blackwell (2007).	