PHY5105 Experimental Physics I

Course Code	PHY5105	Semester	I
Course Title	*Experimental Physics I*		
Credits	4	Type	Core

Course Outcome

Students achieve ability to:

1. Learn various experimental and computational tools thereby developing analytical abilities to address real world problems.

2. Adopt the skills related to research, education, and industry-academia.

3. Understand the behaviour of electronic components and perform analysis and design of bias circuits for diodes, transistors etc.

Course Structure

Theory: Research methodology. Role of hypothesis. Errors in experiment. Error analysis. Curve fitting: practical methods.

General Physics Lab: Cornu's experiment, Wien's displacement law. Microwave propagation along lines, laser optics lab (beam profile, diffraction, etc), e/m experiment, Planck's constant, Stefan's constant, Brewster's angle, Goy's method etc.

Electronics Lab: Network theorems, Transistor biasing, amplifiers: frequency response, operational amplifier circuits, oscillators. high impedance amplifiers, FET characteristics, amplitude modulation, half and full adder circuits, flip-flops, microprocessor experiments etc.

Suggested Books

1. G.L. Squires, *Practical Physics*, Cambridge (2011)
2. D.W. Preston and E.R. Dietz, The Art of Experimental Physics, Wiley (1991)
3. R.A. Dunlap, Experimental Physics: Modern Methods, Oxford (1997)
4. A.C.Melissinos and J. Napolitano, Experiments in Modern Physics, Academic Press (2003)
5. S. Franco, Design with Operational Amplifiers, McGraw Hill (2002)
6. M.M.S. Anand and L.K.Maheshwari, Laboratory Experiments and PSpice Simulation in Analogue Electronics, PHI (2006)
7. D.M.Kaplan and C.G.White, Hands-n Electronics, Cambridge (2003)