**PH 581: Optics Laboratory (0-0-6: 3)**

1. **Faraday Rotation**: Verdet constants of glass and water from measurements of the rotation angle as a function of the magnetic field strength.
2. **Fibre Optics**: Study the basic structure and types of the optical fiber, measure the numerical aperture and output power.
3. **Michelson Interferometer**: Measurement of Wavelength and Refractive index.
4. **Kerr Effect:** Quadratic electro-optic effect.
5. **Zeeman Effect**: Study the splitting of degenerate energy levels in mercury under application of a strong magnetic field.
6. **Fabry-Perot Etalon**: Very precise measurement of the wavelength of a spectral line.
7. **Muon Lifetime**: Measure speed of cosmic-ray muons and infer relativistic effects; measure the lifetime of muons decaying at rest.
8. **Nuclear Magnetic Resonance**: Measure the proton magnetic moment, and verify that the spin t/z proton is not a Dirac particle.
9. **The Franck-Hertz Experiment**: Demonstrated the existence of excited states in Mercury/ Neon atoms, helping to confirm the quantum theory which predicted that electrons occupied only discrete, quantized energy states.
10. **Magnetic Susceptibility-Gouy's Method**: Determination of magnetic susceptibility of solid samples.
11. **Magnetic Torque**: To make quantitative measurements involving electromagnetism, torque and simple harmonic motion and also to study, quantitatively, the phenomenon of precession.

**Text Books *&* References**

1. N. Menn, “Practical Optics”, Elsevier Academic Press.
2. H. S. Hans, “Nuclear Physics: Experimental and Theoretical”, New Age International.
3. R. S. Sirohi, “A Course of Experiments with He-Ne Laser”, New Age International.