

MPHC4252

Core Lab-II (Non-Electronics) and Computational Physics

Group A: Core Lab-II (Non-Electronics)

1. Determination of Numerical aperture of optical fibers and related experiments
2. To study Iodine absorption spectrum
3. To study Acousto-optical effect using piezo-electric crystal and determination of the velocity of ultrasonic wave in liquids.
4. Interferometry with Michelson's / Jamin's interferometer.
5. Spectrophotometry : Absorption of biomolecules / study of melting.
6. Experiments with Laser: Characteristics of a Diode Laser
7. Experiments with Laser: Thickness of a wire
8. To Study Ferromagnetic to Paramagnetic Phase Transition.
9. Energy band gap of semiconductor by studying the luminescence spectra.
10. Determination of Curie temperature using ferroelectric material

[36 lectures]

Group B: (Lab) (Computational Physics)

Numerical Computing using Matlab / Scilab:

Solution of Nonlinear ODEs and System of ODEs: tools and algorithms (Euler, Modified Euler, RK, Stiff Integrators). Solution of PDES using FD / FEM scheme: Elementary examples. Modelling of Physical Systems: (a) Nonlinear Oscillations, (b) Stochastic Computation.

[36 lectures]