NIT Mizoram
Department of Physics

Paper : Physics
Code : PHL 1101 (L-T-P: 3-0-0) **Credit-6**

Wave and Oscillations: Overview of vibrations with emphasis on damped and forced oscillations, Resonance, Coupled oscillations, Simple Harmonic Motion. **(05 hrs)**

Optics: Interference- Conditions for interference, types, Methods for producing Interference pattern of light, Fresnel's bi-prism, Newton's ring.

Diffraction- Types of Diffraction, Diffraction by a single slit, double slit, diffraction by a N parallel slit: Diffraction grating.

Polarization- Types of polarized light, Brewster's law, Nicol prism. **(10hrs)**

Wave Mechanics: Planck's theory of black body radiation, Photoelectric effect, Compton effect, Wave particle duality, de-Broglie matter waves, Davisson and Germer's experiment, Physical interpretation of wave function, Schrodinger's wave equation and its application particle in a box. **(10 hrs)**

Solid State Physics: Free electron theory, Band theory of solids- Classification of materials based on band theory of solid, Semiconductor, Fermi level in an intrinsic and extrinsic semiconductor, Hall effect. **(06 hrs)**

Lasers and Fibre optics: Lasers, Einstein's A and B coefficients, Population inversion, Optical pumping, Optical Resonators, Characteristics of lasers, Ruby laser, He-Ne laser, Semiconductor laser, Introduction to fibre optics, Construction, types, Principle of wave propagation, Numerical aperture, Fibre losses, Applications of optical fibre. **(10hrs)**

Text books:

1. Concept of Modern Physics; Arthur Beiser: Tata Mc Graw Hills, 6th edition, 2009.
2. Applied Physics for Engineers; Neeraj Mehta: PHI Publication, 1st edition, 2011.
3. Fundamental of Physics Extended Volume; Resnick Halliday and Walker: John Wiley & Sons , 8th Asian Edition, 2008.

Reference books:

1. Quantum Mechanics; L. I. Schiff: TataMc Graw Hills, 3rd edition, 2010.
2. Optics; Ajoy Ghatak: Tata McGraw Hills, 4th edition, 2009.

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Paper : Physics Laboratory
Code : PHP 1101 (L-T-P: 0-0-2) **Credit-2**

Minimum eight experiments are required to be performed in a semester:

List of the Experiments:

1. Hall Effect experiment.
2. CRO experiment.
3. Semiconductor diode characteristics.
4. Characteristics of a solar cell.
5. To determine the bandgap in a semiconductor using reverse biased p-n junction diode.
6. To determine e/m for an electron by Thomson's method.
7. He-Ne Laser experiment.
8. Diffraction grating experiment by using semiconductor diode laser.
9. Newton's Ring experiment.
10. Dispersion of prism experiment by using spectrometer.
11. To determine the wavelength of sodium light by using plane transmission grating.
12. Fresnel's biprism experiment.

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Note: Department may add or delete any experiment subject to availability.