

AMMR-03: PHYSICS OF MATERIALS

Course Details:

Failure of classical physics, black body radiation, Planck postulate, early experiments exhibiting quantum effects, Photoelectric effect, Davisson-Germcr results, Compton shift, Pair production, Wave particle duality, de-Broglie postulate and Einstein relation, Wave description & localization, Uncertainty principle, probability density, expectation value, energy & momentum operations, Schroedinger equation, Solution for step, Barrier & well potentials, Periodic well potentials, Block Functions, Kronig-penny model, Energy bands in metals & semiconductors, Brillouin zones, Bravais lattices & crystal Structure. Miller indices of crystal direction & planes, crystal symmetry, reciprocal space lattices. Lave equation & Bragg relation, Block waves & diffraction.

Text Books and Reference:

1. The Science and Engineering of Materials, Donald R. Askeland (Chapman & Hall)
2. Materials Science and Engineering, V. Raghvan