MSD-322 **Electronic Materials for industry** **3 Credits (3-1-0)**

Semiconductor Fundamentals: Band structure, indirect and direct band gap,optical properties, carrier statistics

Semiconductor Growth: semiconductor material purification andcrystal growth, epitaxy, CVD and MBE,

Processing: Specific material requirements, Doping by implantation and diffusion, dielectric and insulators, ohmic and barrier contacts, band edge behaviour, empirical rule, alloy design,PN Junction, Schottky and MaS device structures,.

Dielectric& Ferroelectrics Materials: Dielectric constant and polarization, polarization mechanism, linear and nonline dielectric, pyro-piezo,and ferroelectric properties, application

Magnetism: diamagnetism paramagnelism, polypararnagnetism, ferro, antiferro, and ferrimagntism. Soft andhard magnet materials, permanent magnet and transformers.

Books and References:

1. Elements of Materials Science and Engineering, L. H. Van Vlack (Addison-Wesley)
2. Materials Science and Engineering: An Introduction, W. D. Callister, (WILEY)
3. The Science and Engineering of Materials, Donald R. Askeland (Chapman & Hall)
4. Solid State electronic Devices, B.G. Streetman (PHI)