SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Materials Science)
Semester: IV
Syllabus with Effect from: June - 2013

Paper Code: PS04CMTS07	**Total Credit: 4**
Title Of Paper: Optical, Magnetic And Dielectric Properties Of Materials	

Unit	Description in detail	Weightage (%)
I	Electromagnetic radiation, interaction of light with matter, atomic and electronic interactions, optical properties of metals and non-metals, reflection, refraction, transmission and absorption, dark and photo conductivity.	25%
II	Introduction, classification of materials based on electrical conductivity, dielectric properties of materials, dielectric constant, strength and loss factor, capacitance and capacitors, field vector and polarization, types of polarization. Concept of symmetry, classification of materials based on symmentry, piezoelectric and converse effect, piezoelectric materials, pyroelectricity and pyroelectric materials, ferroelectricity.	25%
III	Introduction and basic concepts, magnetic dipoles and field vectors, magnetic induction, magnetization and magnetic susceptibility. Origin of magnetic moments, magnetic moments of body, magnetic moments of atoms, calculation of atomic magnetic moments, Bohr magnetron.	25%
IV	Classification of magnetic materials, magnetic domains and walls, hysteresis, soft and hard magnetic materials, applications, influence of temperature on magnetic behavior.	25%

Basic Text & Reference Books:-

- Materials Science and Engineering, William D. Callister Jr.An Introduction
- Materials Science for Engineering, J.C.Anderson, ,K.D.Leaver, R.D.Rawllings and P.Leaver
- Materials Science,Manas Chandra