SARDAR PATEL UNIVERSITY
Programme: MSC (Applied Science)
Semester: II
Syllabus with effect from: December 2013

Paper Code: PT02CASC01	Total Credits: 4
Title Of Paper: Synthesis and Properties of Materials	

Unit	Description in detail	Weightage (%)
1	**Introduction to Various Materials:** Introduction to Materials & Materials Science. Type of materials, Properties of materials, levels of structure, processing of materials, structure- property – processing relationship. Environmental effect of Materials behavior, Materials selection.	**25 %**
2	**Methods of Synthesis of Polymeric Materials:** Macromolecular concepts, structural feature of polymers, correlation between structure and properties of various polymerization methods. Bulk, solution, suspension and emulsion polymerization techniques, interfacial, melt and solution polycondensation, some other miscellaneous techniques.	**25 %**
3	**Glass and Ceramic Materials:** Various types of ceramics, phase diagrams, principles of main fabrication techniques. Nature of glass, structure, glass forming systems, silicate systems, non-silicate systems, Types of Glasses, manufacture of glass.	**25 %**
4	**Metals and Alloys:** Fe-Fe3C phase diagram, pearlite, bainite, martensite, cementite, heat treatments processes, classification of steels and their applications. Aluminium alloys, magnesium alloys, copper alloys, nickel, cobalt, zinc alloys, titanium alloys, refractory metals.	**25 %**

Basic Text & Reference Books:

- The Science and Engineering of Materials, Donald R. Askeland PWS-Kent Publishing
- Polymer Science, V R. Gowarikar, N. V. Vishwanathan and J. Sreedhar, Wiley Publications
- Principles of Polymer Science, P. Bahadur and N. V. Sastry, Narosa Publishers, New Delhi
- Materials Science and Metallurgy, V.D. Kodgire Everest Publishing House.
- Physical Metallurgy: Principles and Practice, V. Raghavan, PHI Learning Publishers
- Science of Engineering Materials: Manas Chanda, Macmillan Publishers
- Ceramic Hardness, Ian McColm, Springer Publications