

SARDAR PATEL UNIVERSITY
Programme & Subject: P. G. Diploma in Defence Materials
Semester: I
Syllabus with effect from: June - 2015

Paper Code: PT01EDMC01	Total Credit: 4
Title Of Paper: Materials Science	

Unit	Description in Detail	Weightage (%)
I	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%
II	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%
III	Metals and Alloys: Fe-Fe ₃ C 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%
IV	Carbon nanostructures: Clusters and nanotubes (preparation, fabrication, structure, doping, electrical vibrational and mechanical properties), applications of carbon nanotubes, self assembly and catalysis (nanoparticles, porous materials, pillared clays and colloids)	25%

Basic Text & Reference Books:-

- The Science and Engineering of Materials, Donald R. Askeland PWS-Kent Publishing
- 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
- Allan McMichael; Nanoscience, Random Exports
- Charles P. Poole, Jr., Frank J. Owens; Introduction to Nanotechnology, Wiley-India

