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

Paper Code: PS04EMTS01 Title Of Paper: Materials & Environment

Total Credit: 4

Unit	Description in detail	Weightage (%)
Ι	Introduction to Environmental pollution, atmospheric pollutants, source of air pollutions, water pollution. Industrial effluents, pollution due to sewage and sludge, pesticides pollution, solid waste problems, metal pollutants, Environmental carcinogens, control of pollution.	25%
Π	Weathering, Air and Moisture, Radiation and heat, Pollutants, Microbial degradations, Control of deterioration, thermal protection, Optical properties, solar cells, lubrication, sublimation/ evaporation, loss of materials, Thermal Shock. Electrochemical nature of corrosion, Concepts of reaction at an electrodes. Nernst equation. Tafel equation and polarisation. Corrosion velocities, Bimetallic effects. Differential aeration, Pourbaix diagrams, Formulation of stainless steels. Corrosion of Iron, Zinc, Aluminium, Co-operation and selected alloys. Protection against corrosion.	25%
III	Packing, Insect proof packaging, Rodent proof packing, Air Conditioning, Constant damp heat and cyclic damp heat, humidity and cycles of humidity, Isolation from environment radiations.	25%
IV	Trends in waste generation, maximum energy recovery from furnaces, recovery of waste Materials and raw materials from plants components, waste commission for energy recovery, economic refractory, control and Instrumentation, measuring and measuring devices.	25%

Basic Text & Reference Books:-

- > Theory of corrosion and protection of metals, Tomashov N. D.
- ➢ Corrosion engineering M. G. Fontana
- Science of Engineering Materials Manas Chanda
- ➤ Waste recycling for energy conservation Davidkut and Gerard Nare

