

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

Paper Code: PS04CPST08	Total Credit: 4
Title Of Paper: Polymer Rheology	

Unit	Description in detail	Weightage (%)
I	Introduction to Rheology: Different parameters, Rheological equation of state, Newtonian and Non-Newtonian, Importance aspects of rheology, Importance of rheology on polymer processing, shear thinning behavior, influence of temperature and molecular structure. Flow properties- flow through circular tube, flow between parallel plates, Die Swell, and Melt fracture, Sharkskin, Orientation and Shrinkage, Frozen in orientation, Weissenberg effect, and entrance effect.	25%
II	Rheology in polymer processing: Introduction, Low flow process, Mixing process, Constrained flows, Free surface flows, Bulk deformations, Injection moulding, Blow moulding, Film blowing and Sheet extrusion.	25%
III	Measurements of flow properties & Individual polymers: Mixing equipments, concentric cylinder rheometer, Cone and plate rheometer, Capillary rheometer, Parallel disc rheometer, torque rheometer, rheo-optics.	25%
IV	Rheology of Individual Polymers: Individual polymers like polyethylene, propylene, polystyrene, poly vinyl chloride, nylons, poly acetals, poly tetrafluoroethylene, polycarbonates and rubbery materials.	25%

Basic Text & Reference Books:-

- Polymer and Composite Rheology, Rakesh K. Gupta Marcel Dekker Inc., New York
- Polymer Melt Rheology, F. N. Cogswell, George Godwin Ltd., London
- Rheology of Polymer Systems, Carreau, De Kee, Chhabra, Hanser Gardner Publication Inc., Cincinnati.
- Flow of high polymers, Stanley Middleman, Inter science publishers.
- Melt Rheology and its role in Plastics processing, John M. Dealy and Kurt. F. Wissbrun, Van Nostrand Reinhold, New York.
- Plastics Rheology in Plastics Quality Control, John M. Dealy and Peter C. Saucier, Hanser Gardner Publication Inc., Cincinnati.

