Course Title: Polymer Chemistry

Course Code: PSE-821

Credit Hours: 3-0

Prerequisite: Nil

Course Objectives

Polymerization in the suspension, emulsion and reactive extrusion modes for a host of resin systems will be elaborated. The course is also deal with multiphase systems encountered in polymer processes such as solid additives and fibers and how mechanical properties are affected by choice of processing conditions.

Course Outcomes

This course will introduce the students to the basic differences which separate in viscid and viscous reactions regimes.

Course Contents

Definition and classification, Market drivers for fabrication of composites, Natural fiber composites, History, Agronomics, Mechanical properties application, Synthetic fibers composites, Fabrication (mechanical and thermal) and characteristics of synthetic fibers, Graphite, Glass, Aramid fibers, Polyester fiber applications in aerospace, automobiles, ballistics, wood plastic composites history, characteristics and processing, applications, Synthetic resins (LDPE, HDPE, UHMWPE) and additives (fillers, antioxidants, plasticizers), Polyolefins, Characteristic mechanical and thermal properties, Industrial applications Processing methods (Injection molding, blow molding, compression molding), Introduction of techniques for characterization, (1) Spectroscopic methods (FTIR, UV), (2) Chromatographic analysis, (HPLC, GLC), (3) Thermal analysis (TGA/DSC)

Recommended Books

1. Polymer Matrix Composites R.E.Shalin, Chapman, Hall 1995.
2. Composites Materials, Engineering, Science Matheusand Rawlings, Chapman and Hall 1995.
3. Polymer Matrix Composites Ramesh Talreja and Jane Anders, E. Mansion, , Elsevier 2001
4. Polymeric Multi component Materials L.H. Sperling, Wiley 1997
5. Polymers Blends and Alloys (An overview) R.P.Singh, C.K.Das and S.K. Mustafa Asian Books (Pvt) Ltd New Delhi 2002 ISBN 81-86299-29-7