

UG

Course Code: CH411

Credit: 3

Version: 1

Prerequisite Course: Nil

Department: **Chemical Engineering**

Course Name: **Polymer Science and Technology**

L-T-P: **3-0-0**

Approved on:

Chemistry of Polymerization Reactions

Functionality, polymerization reactions, polycondensation, addition free radical and chain polymerization. Copolymerisation, block and graft polymerizations, stereospecific polymerization.

Polymerization Kinetics

Kinetics of radical, chain and ionic polymerization and co-polymerization systems.

Molecular Weight Estimation

Average molecular weight: number average and weight average. Theoretical distributions, methods for the estimation of molecular weight.

Polymerization Processes

Bulk, solution, emulsion and suspension polymerization.

Thermoplastic composites, fibre reinforcement fillers, surface treatment reinforced thermoset composites – Resins, Fibres, additives, fabrication methods.

Rheology

Simple Rheological response, simple linear viscoelastic models – Maxwell, Voigt, material response time, temperature dependence of viscosity, Rheological studies.

Books

1. Rodringuez, “*Principles of Polymer Systems*”, Tata McGraw Hill, 1970.
2. Billmayer Jr. and Fred. W., “*Textbook of Polymer Science*”, Wiley Tappers, 1965.
3. David, J. W., “*Polymer Science and Engineering*”, Prentice Hall, 1971.
4. Schmidt, A. K. and Marlies, G. A., “*High Polymers - Theory and Practice*”, McGraw Hill, 1948.
5. McKelvey, J. M., “*Polymer Processing*,” John Wiley, 1962.
6. Manoriffs, R. W., “*Man-made Fibres*,” Wiley Inter Science.