

CO-ORDINATING DEPARTMENT – DEPARTMENT OF INDUSTRIAL CHEMISTRY
SEC – III – VALUE ADDED COURSE
ANY SEMESTER BETWEEN II to V

	Polymer in Chemscience	40 HRS	01 CREDIT
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Objectives:

1. Determine different polymers, their properties and access them according to their industrial applications.
2. Study different polymerization techniques & their mechanisms.
3. Know Industrial polymer processing & their engineering aspects.

Unit-I: Introduction of polymer **(3 Hrs)**

- Polymer, Oligomer, Macromolecules,
- Classification of polymer, Sources of polymer, Monomers, Functionality concept, Concept of Cross linking.

Unit-II Properties of Polymer **(3 Hrs)**

- Physical properties, Chemical properties, Mechanical properties

Unit-III: Polymerization Techniques **(3 Hrs)**

- Polymerization techniques including three stage addition polymerization,
- Condensation

Unit-IV: Polymer Synthesis **(3 Hrs)**

- Phenol – formaldehyde resins.
- Poly olefins – Poly ethylene, HDPE, LDPE, LLDE, Polypropylene, Ethylene –
- PVC
- Polyamides – Nylon-6, Nylone-66

Unit-V: Polymer Processing **(3 Hrs)**

- Polymer processing introduction
- Compounding
- Molding, Compression molding
- Casting
- Rolling
- Applications of polymers

Practicals:**(25 hrs)**

1. Prepare Phenol Formaldehyde polymer.
2. Prepare cellulose acetate from cellulose.
3. Prepare melamine formaldehyde copolymer.
4. Prepare glyptal resin from phallic anhydride.
5. Prepare urea formaldehyde copolymer.
6. To identify given sample of polyethylene.
7. To identify given sample of Nylon-6.
8. To identify given sample of polyvinyl chloride.
9. To identify given sample of Styrene acrylonitrile.
10. To identify given sample of Polyvinyl alcohol.

Text books:

1. Vasant R. Gowariker, 2013 N. V. Viswanathan, Jayadev Sreedhar. Polymer Science, New Age International, 1986 – 11030.
2. Fred W Billmeyer, 2014, Textbook of polymer science, Wiley

Reference Books:

1. J.A. Brydson, Plastics Materials - (Seventh Edition), ISBN-9780750641326, Printbook, Release Date: 1999
2. A. Ravve, Principles of Polymer Chemistry, ISBN- 9781461422129, Springer, New York, NY