

PCPE4201 **Fundamentals of Polymer Science**

Module-I

Basics of fundamentals of chemistry related to polymers The Science of large molecules Basic concepts of polymer science-History of macromolecular Science-Nomenclature of polymers-Inter molecular forces and chemical bonding in polymers-Thermal transition.

Polymerization

Mechanism and kinetics-Molecular weight and molecular weight Distribution-and its measurements. Effect of Molecular weight on processing and properties.

Module-II

Polymer structure and morphology, Stereochemistry-Molecular interactions Crystalline structure and factors affecting crystallinity - Polymer-Structure property relationship. Physical and chemical methods of modifying polymer properties

Module-III

Reaction of polymers Reaction of polymer with other chemicals-Degradation and stabilisation of polymers.

Polymer characterisation techniques like UV, IR, NMR, DSC, TGA, TMA etc.

Text Books

- 1 Billmeyer Jr.; Fred W., Textbook of Polymer Science, Wiley- Interscience Publishers, New York (1962)
2. Fried; Joel R., Polymer Science and Technology, 2nd Edition, Prentice-Hall of India Pvt. Ltd., New Delhi (2003).

Reference Books

3. Ebewele, Robert O., Polymer Science and Technology, CRC Press, Boca Raton (2000).
4. Fried; Joel R., Polymer Science and Technology, Prentice-Hall of India Pvt. Ltd., New Delhi (2000).
5. Ghosh; Premamoy, Polymer Science and Technology of Plastics and Rubbers, Tata McGraw-Hill Publishing Co. Ltd., New Delhi (1990).
6. Ghosh; Premamoy, Polymer Science and Technology-Plastics, Rubbers, Blends and Composites, 2nd Edition, Tata McGraw-Hill Publishing Co. Ltd., New Delhi (2002).
7. Kaufmann; H. S. and Falcetta; J. J., Introduction to Polymer Science and Technology, John Wiley and Sons, New York (1977).
8. Kumar; Anil and Gupta; Rakesh K., Fundamentals of Polymers, McGraw-Hill Inc., (International Edition), New York (1998).
9. Kumar; Anil and Gupta; S. K., Fundamentals of Polymer Science and Engineering