



ChE 342 - Polymer Science and Engineering

Code and Name: ChE 342, Polymer Science and Engineering

Credit Hours: 3 (Lecture: 3, Tutorial: 1)

Textbook:

- Principles of Polymer Systems, F. Rodriguez, C. Cohen, C.K. Ober, and L.A. Archer, 6th Edition, Taylor and Francis, 2016

Other References:

- Journals, Handouts, Reports, as needed

Course Description:

Polymer synthesis & characterization. Dependence of properties on molecular structure & microstructure. Polymer rheology. Unit processing operations, formulation & uses of polymers, mechanical properties, degradation & failure methods

Pre-requisites: ChE 213 Principles of Chemical Engineering I, CHEM 202 Organic Chemistry

Co-requisites: None

Course Learning Outcomes:

With relation to ABET Student Outcomes (SOs: a-k)

1. Define the basic structure and thermodynamics properties of Polymers. (1)
2. Recognize the various types of polymer formation. (1)
3. State the different kinds of kinetics of polymerization processes. (1)
4. Describe the common polymer fabrications techniques. (1)
5. Develop analytical and reasoning skills (6)
6. Calculate the final expected structure/properties of polymer/copolymer. (2)

Topics to be covered:

- Introduction
- Basic structure of polymer
- Physical states and transitions
- Polymer formation
- Polymerization processes
- Fabrication processes
- Extrusion and molding
- Recycling and resource recovery

Grading Policy:

The grading for the course are 60% coursework and 40% Final Exam. The course work consists of two Midterm Exams, where each midterm exam is worth 20%. It also includes quizzes, homework, and projects for the remaining 20% that is modified by the course instructor.

