

Chem 561/Chem 465: Polymer Chemistry I: Polymer Synthesis (Fall 2009) revised 9/25/09

Catalogue Description: Covers step growth polymerization (including polyesters, polycarbonate, nylon, epoxies, urethanes, and formaldehyde based polymers), step growth kinetics, molecular weight distributions, infinite networks and gelation, techniques of polymerization, ring-opening polymerization, thermodynamics of polymer solutions, biological polymers, inorganic polymers, biomedical applications, and electrically conducting polymers.

Restrictions for 465: May not be enrolled in one of the following Program Level(s):

Continuing Education

May not have the following Classification(s):

Freshman

Pre-Requisites: CHEM 242 Minimum Grade: D

Restrictions for 561: Must be enrolled in one of the following Program Level(s):

Graduate Quarter

Course Objectives:

- (1) Knowledge of what kinds of monomers can be polymerized by a step-growth mechanism
- (2) An understanding of the main features of the kinetics of the step-growth process and how the kinetics differs from that of chain growth
- (3) An understanding of the origin of wide versus narrow molecular weight distributions
- (4) An understanding of the chemistry of step growth as well as how the product changes as the reaction proceeds
- (5) Knowledge of the main characteristics of polymer solutions
- (6) Familiarity with the use of polymers in several applications.

Required Textbook: Allcock/Lampe/Mark, "Contemporary Polymer Chemistry, 3rd Ed, Prentice-Hall, 2003.

Instructor: Prof. Lynn S. Penn, 305 Disque

Meeting Times/Locations: Thursday 6-9:00 pm; Curtis 341.

Grading Components: A quiz will be given at the beginning of each class period. There will be a mid-term exam and a final exam: For all students, the quizzes together will count 20%, with the lowest three quiz grades being dropped. The midterm will count 40% of the grade and the final will count 40% of the grade. For graduate students, of whom more is required in the course, there will be additional questions on the exam. (No presentations are required.) Exact date of the mid term will be announced.

Grading policy:

A+ = above 96, A = 92 to 96, A- = 88 to 92,
B+ = 84 to 88, B = 80 to 84, B- = 76 to 80,
C+ = 70 to 76, C = 64 to 70, C- = 58 to 64,
D+ = 54 to 58, D = 50 to 54,
F = below 50.

Academic honesty/cheating: Students are held to the highest expectations and standards regarding honesty in all aspects of the course. Any cheating during an exam will result in a score of zero for the exam. More serious or repeated offenses will be reported to the University.