

**Chemistry 613 Modern Polymer Chemistry Fall 2011 Dr. Honeychuck**

This syllabus can be found at <http://mason.gmu.edu/~rhoneych/613syllb.pdf>

Wed 7:20-10:00 pm 126 S&T I

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Required Text: Rodriguez, F.; Cohen, C.; Ober, C. K.; Archer, L. A. *Principles of Polymer Systems*; 5th ed., Taylor & Francis: New York, 2003.

Required Course Packet: Honeychuck, R. V. *Chemistry 613*, available in the Johnson Center Bookstore lower level.

<u>Date</u>	<u>Pages</u>	<u>Subjects</u>
Aug 31	1-9, 21-22, 100-104	Polymer overview, plastics, rubber, fibers, coatings, adhesives, classification, stepwise and chain polymerization, nomenclature
Sept 7	22-28, 209-250	Linear polymers, branched polymers, networks, molecular weight, number-average and weight-average molecular weight
Sept 14	260-274, 222-228	Polymer solutions, gel permeation chromatography
Sept 21		Midterm 1 on Aug 31 - Sept 14, Polymer overview - gel permeation chromatography
Sept 28	99-118, 59-67, 78-82, 700-702	Radical chain polymerization, differential scanning calorimetry
Oct 5	122, 130-133, 523-527, 71, 118-128, 189-190	Ziegler-Natta polymerization, cationic and anionic polymerization
Oct 12	118-128	Cationic and anionic polymerization
Oct 19	134-135, 144-145	Group transfer polymerization, ring opening metathesis polymerization
Oct 26		Midterm 2 on Sept 28 - Oct 19, Radical chain polymerization - ring opening metathesis polymerization
Nov 2	135-142, 212-215, 639-645, 658, 552-555	Stepwise polymerization, polyurethanes
Nov 9	552-555	Polyurethanes
Nov 16	552-555, 194-202	Polyurethanes, bulk, solution, suspension, and emulsion polymerization
Nov 23		Day before Thanksgiving. No 613.
Nov 30	194-202, 8, 477-480	Bulk, solution, suspension, and emulsion polymerization, oil based paint, latex paint

Dec 7 630-633, 494 Fluoropolymers  
Dec 14 Comprehensive Final Exam, 7:30 - 10:15 pm, 126 S&T I

Grading:

29% Midterm 1  
29% Midterm 2  
2% Problem sets  
40% Final Exam  
100%

On Reserve in the Johnson Center:

Rodriguez, F.; Cohen, C.; Ober, C. K.; Archer, L. A. *Principles of Polymer Systems*; 5th ed., Taylor & Francis: New York, 2003.

Odian, G. G. *Principles of Polymerization*; 4th ed., Wiley-Interscience: New York, 2004.

Billmeyer, F. W., Jr. *Textbook of Polymer Science*; 3rd ed., John Wiley & Sons: New York, 1984.

Chemistry 613 presents the basics of polymer science. Previous polymer knowledge is not necessary. Among the subjects covered are types of polymers, types of polymerization reactions used to form those polymers, molecular weights, and physical properties of polymers. Since many students in this course have only a limited polymer background, these subjects will be related to their counterparts in the low molecular weight/monomer world, where students have a more in-depth knowledge. This is an organic chemistry-based course with some elements of physical and analytical chemistry. The prerequisite is POI (permission of instructor). The text, by Rodriguez and coauthors, is widely used and respected because of its clarity of content. It is in its 5th edition. The course packet contains copies of many of the figures presented in class.

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services at 993-2474. All academic accommodations must be arranged through that office.