

**CHEMISTRY 4272 - Section 2993 – TWO CREDIT COURSE**  
**Spring Semester 2017**  
**Monday and Wednesday, Period 7 – Leigh Hall Room 104**

**THE ORGANIC CHEMISTRY OF HIGH POLYMERS**  
or  
**"Vignettes in Polymer Chemistry"**

**Every aspect of your life is influenced by polymers.** You use them from morning to evening. They are used extensively in medicine. You know them by common, generic, object and trade names such as Teflon, Vinyl, PVC, plastics, elastomers, resins, epoxies, polyurethanes, polyester, nylon, plexiglass, lycra, spandex, rayon, coke bottles, frisbees, footballs, tires, shampoo, wood, carpet, silk, paper, etc. The list literally is endless.

What you don't know is the chemistry used to form these polymers. We are going to change that by discussing the fundamentals of synthetic polymer chemistry. It is a chemistry class, not a materials class. No previous course in polymer chemistry is required. A knowledge of sophomore organic chemistry is assumed.

Material in this two-credit course will include basic concepts, synthesis, propagation mechanisms, (limited) kinetics, and characterization techniques. The reference for the course is **Polymer Chemistry: An Introduction** by Malcolm P. Stevens, 3rd Edition, Oxford University Press, 1999.

Note that this class is different from typical lower level classes. We don't cover the text chapter to chapter; rather we will cover the material defined below on a step-by-step basis, skipping around the text and using the internet. **Thus attending class is very important.**

<u>Vignette</u>	<u>Description</u>	<u>Relevant Chapter</u>
1	Polymer Concepts	1
2	Molecular Weight Analysis	2
3	Chemical Structure & Polymer Morphology	3
4	Radical Chain Growth Polymerization	6
5	Ionic Chain Growth Polymerization	7
6	Stereochemical Analysis in Polymers	Various
7	Coordination Chain Growth Polymerization	8
8	Step Growth Polymerization	10
9	Ring Opening Polymerization	10 & 16
10	Copolymerization	Various
11	Living Polymerization	Various
12	Polyesters and Polyamides	Various

We meet twice a week (Mondays & Wednesdays, 7<sup>th</sup> period, Leigh Hall 207. The material you will be tested on will be taken both from class lectures and the appropriate sections of the text. Homework will not be graded, but I am willing look over any homework problems if you like.

A midterm and a final will be given, each of equal value. Office hours will be held on Wednesdays from 3PM to 5PM, or by appointment.

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