

**CHEMISTRY 5275**  
**Fall Semester 2011 – Section 3504**  
**Tuesdays, Thursdays, 5<sup>th</sup> Period – 11:45PM to 12:35PM**  
**Leigh Hall Room 104**

## **THE ORGANIC CHEMISTRY OF HIGH POLYMERS**

or

### **"Vignettes in Polymer Chemistry"**

This is a first, basic course in organic polymer chemistry. I assume you have no background in the subject. I do assume you have taken sophomore organic chemistry, will not be “teaching” the fundamentals of organic chemistry again during lecture. The organic and organometallic chemistry of macromolecules is what we will do, mostly dealing with synthesis and mechanism. Brief lecture forays will venture into polymer structure and morphology, kinetics, and polymer characterization techniques. In addition to me, others will offer lectures, especially in his/her expert area within polymers.

Being a two credit course we can only do justice to the basics of polymer synthesis and mechanism, which in itself is vast in scope. Even greater in size is the entire field of polymer science & engineering – we won't go there. However, if you apply yourself in this first polymer graduate course you will establish a fundamental framework in polymers – then you can go as far as you like. I learn something new about polymers all the time.

The course is organized around a series of “vignettes” (see below), which are presented from a mechanistic perspective. The text is Malcom Steven's **Polymer Chemistry: An Introduction**, 3rd Edition. Note also the internet has become an excellent source of free material. Were I a graduate student today, I would bolster my lecture notes with info from the internet.

The key to success? **Read.** Do problems. Attend class. This is not an undergraduate course, is handled differently from what you have known.

<u>Vignette</u>	<u>Description</u>
1	Polymer Concepts & Molecular Weight
2	Polymer Structure & Morphology
3	Step Growth Polymerization
4	Radical Chain Growth Polymerization
5	Ionic Chain Growth Polymerization
6	Stereochemical Analysis in Polymers
7	Ziegler/Natta and Metallocene Polymerization
8	Ring Opening Polymerization
9	Copolymerization
10	Living Polymerization
11	Polyesters and Polyamides
12	Characterization of Polymers

A midterm and a final (50% each) will be given. Class notes plus the text will form the basis for these exams. Office hours will be held on Tuesdays from 1PM to 3PM; however, given our small class size we can arrange things as needed.

K B Wagener 23 August 2011