

CHEMISTRY 4272
Spring Semester 2018 – Section 2993
Mondays, Wednesdays, Period 7 – 1:55PM to 2:45PM
Leigh Hall Room 242

THE ORGANIC CHEMISTRY OF HIGH POLYMERS

Or
"Ten Vignettes in Polymer Chemistry"

This is a first course in organic polymer chemistry. I assume you have no background in the subject. Important to note is that this is a chemistry class and not a materials class. It is also a completely different sort of undergraduate class, as I will explain during the first week.

I do assume you have taken sophomore organic chemistry and so I will not be “teaching” the fundamentals of organic chemistry during lecture.

The organic 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.

Being a two-credit course we will only examine the basics of polymer synthesis and mechanism. The entire field of polymer science & engineering is enormous – we won’t go there - again, this is not a materials course.

We will organize 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, certainly dated but correct in science. Even the 2nd edition is acceptable. We will start with Chapter 1, and then move around the book according to the vignettes below (in other words, not following chapter by chapter in the traditional sense). Little homework is assigned. Tests are taken exclusively from lectures; your class notes are important, so class attendance is essential. The Internet will also be helpful to you, without question.

Two or three times I will assign a topic for you to study via the internet. You will write a one-page description (not two pages!) of what you have learned on the topic. You will teach me! I will explain in class the first week.

The key to success? **Read. Attend class. Don't just take class notes. Understand them!** Go everywhere to get an answer. I will announce office hours during the first week of class, working on the timing now.

<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

Two tests will be given in class, one about the middle of the semester, the other at the end. Each is worth 50% of your grade. Class notes....class notes..that's what you must understand. If you do, the course will be an easy one for you.