

CHEMISTRY 5275
Fall Semester 2018 – Class # 11969
Mondays, Wednesdays, Period 4 - 10:40 - 11:30
Leigh Hall Room 104

THE ORGANIC CHEMISTRY OF HIGH POLYMERS

This is a first graduate course in organic polymer chemistry. It is also a completely different sort of graduate 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 (and catalysis) chemistry of macromolecules is what we will do, mostly dealing with synthesis and mechanism. We will begin with an understanding of polymer structure and morphology and molecular weight. In addition to me, others will offer lectures.

Once again, being a two-credit course we will examine the basics of polymer synthesis and mechanism. The entire field of polymer science & engineering is so large that we will only briefly cover materials behavior. Excellent courses on this aspect of polymers are found in the Department of Materials Science.

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. Tests are taken exclusively from lectures; your class notes are important, so class attendance is important. The Internet will also be helpful to you, without question.

A number of times I will assign a topic for you to study via the Internet. You will write a one-page description of what you have learned on the topic. I will explain in class the first week this aspect of the course the first day of class.

The key to success? **Read. Attend class. Understand your class notes. Go everywhere to get an answer.** Office hours will be held Mondays right after class in Leigh Hall Polymer Conference Room (3rd floor Leigh Hall - Room 328).

<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: that's what you must understand in addition to the assignments I will explain to you the first week. If you do, the course will work out well.

K B Wagener August, 2018