

# POLYMER CHEMISTRY

**CHEM-450 (3-4-4) TERM # 082**

**Instructor:** Dr. Hasan Al-Muallem

**Office:** 4-233 (Lab: 4-213) **Phone:** x 2378 **Email:** [hmuallem@kfupm.edu.sa](mailto:hmuallem@kfupm.edu.sa)

**Classes:** 11:00-11:50 Saturday, Monday and Wednesday, **Classroom:** 4-238

**Laboratory:** 1:10-5:10 Tuesday, **Lab:** 1-111 (OTC)

**Office Hours:** Open-door policy, by appointment, and 9:00-11:00 Saturday, Monday and Wednesday.

## **Catalog Course Description:**

Basic concepts of polymer chemistry, condensation polymerization, addition polymerization, copolymerization, polymer structure and properties, molecular weight measurement of polymers, analysis and testing of polymers, industrially important polymers and copolymers and plastic technology.

## **Textbook:**

Seymour/ Carraher's **POLYMER CHEMISTRY** by Charles E. Carraher, Jr, Sixth Edition, Marcel Dekker, Inc. New York, 2003.

## **Examinations and Assignments:**

There will be 2 exams during the semester followed by a comprehensive final exam at the end of the semester. Homework and quiz assignments will be given periodically throughout the semester.

The grading will be as follows:

1 <sup>st</sup> Major Exam	(20%)	Chapters 1-5 ( <i>Monday: April 13<sup>th</sup>, 2009</i> )
2 <sup>nd</sup> Major Exam	(20%)	Chapters 6-8 ( <i>Wednesday: May 27<sup>th</sup>, 2009</i> )
Final Exam -	(30%)	Comprehensive ( <i>Wednesday: June 24<sup>th</sup>, 2009, 7:30 AM</i> )
Class Work	(10%)	
Laboratory	(20%)	

## **Preliminary Course Outline:**

CHAP. #	TOPICS	LECTURES
1	Introduction to Polymer Science: Basic Concepts and Definitions	3 classes
2	Polymer Structure and Polymer Structure–Property Relationship	4 classes
3	Molecular weight of Polymers	4 classes
4	Testing and Spectrometric Characterization of Polymers	3 classes
5	Rheology and Physical Tests	3 classes
6	Step-Reaction (Condensation) Polymerization	4 classes
7	Ionic Chain Reaction (Addition Polymerization)	4 classes
8	Free Radical Chain (Addition) Polymerization	4 classes
9	Copolymerization	4 classes
13	Filler and Reinforcements for Polymers	3 classes
14	Plasticizers, Stabilizers, Flame Retardants and Other Additives	3 class
15	Reaction of Polymers	3 classes
16	Synthesis of Reactants and Intermediates for Polymers	3 classes

## **Useful websites:**

***Polymer Chemistry Glossary:*** <http://www.kcpc.usyd.edu.au/discovery/glossary-all.html>

***The Macrogalleria:*** <http://pslc.ws/mactest/maindir.htm>