CHEM ENG/CHEM C178 Polymer Science and Technology
Spring 2016

Lectures	Tu Th 11-12:30, 180 Tan Hall (No lab component)
Instructor	Nitash P. Balsara nbalsara@berkeley.edu Office Hours: TBA
GSI	Ksenia Timachova ktimachova@berkeley.edu Office Hours: M 3:15-4:15, W 2-3 (tentative)
Textbook	*Polymer Chemistry*, 2nd Edition, Paul C. Hiemenz and Timothy P. Lodge The class will follow the book and homework assignments will include questions from the text.
Website	bcourses.berkeley.edu
Homework	Due at the start of class on specified dates. No late homework accepted. One homework grade dropped.

Grading		
	Homework	20%
	Midterm	30%
	Final	50%

This course serves as an introduction to polymer synthesis, characterization, and the physical properties of polymeric materials.

DATE	LECTURE TOPIC	READING	HW DUE
1/19	Introduction, molecular weight, classifications, nomenclature	Chapter 1	
1/21	Measurement methods, synthetic strategies		
1/26	Step-growth polymerization	Chapter 2	#1
1/28	Chain-growth polymerization	Chapter 3	
2/2	Molecular weight distributions and chain transfer		#2
2/4	Anionic, cationic polymerization	Chapter 4	
2/9	Radical polymerization		#3
2/11	Ring-opening polymerization		
2/16	Copolymerization	Chapter 5	#4
2/18	Microstructure and sterioregularity		
2/23	Conformations and bonding, chain models	Chapter 6	#5
2/25	Radius, end-to-end distance, and polymer structures		
3/2	Solution thermodynamics	Chapter 7	#6
3/3	Phase behavior and Flory-Huggins		
3/8	Light scattering	Chapter 8	#7
3/10	Regimes and form factors		
3/15	MIDTERM		
3/17	Viscosity, diffusion, and friction	Chapter 9	
3/22 3/24	SPRING BREAK		

3/29	Size exclusion chromatography		
3/31	Networks and gels	Chapter 10	
4/5	Rubber elasticity theory		#8
4/7	Viscoelasticity and mechanics	Chapter 11	
4/12	Models for entanglement and reptation		#9
4/14	Amorphous polymers, thermodynamics	Chapter 12	
4/19	Amorphous polymers, mechanics		#10
4/21	Crystalline polymers, structure and morphology	Chapter 13	
4/26	Crystalline polymers, growth and kinetics		#11
4/28	Applications and extensions, review		
5/12	FINAL EXAM		