Instructor: Alexei Sokolov  
Buehler 563  
sokolov@utk.edu

Class: Location: Bu 476  
Time: 9:40 A.M. – 10:55 A.M.  
Days: T, TH  
Office hours: Tuesday, 4pm-6pm, Bu-563

Disability Statement  
If you need course adaptations or accommodations because of a documented disability, please promptly contact the Office of Disability Services at 2227 Dunford Hall (telephone/TTY 865-974-6087; e-mail ods@utk.edu). This will ensure that you are properly registered for services.

Required Text  

Supplementary reading  

Lecture Notes: Lecture notes will be placed on the website (http://www.chem.utk.edu/sokolov/courses.html) before each lecture. Students are strongly encourage to have print outs of the notes before each lecture.

Course Coverage:  
I. Molecular Weights of Polymers: Distributions, averages, and methods of determination. (Chapters 1, 8 & 9)  
II. Structure of Polymer Chain: Introduction to chain conformation, configurations, isomerism and stereochemistry. (Chapters 1, 5)  
III. Conformation of Polymer Chain, Chain Statistics: Various models of chain, Gaussian chain. (Chapters 6)  
IV. Polymer Solutions and Blends: Thermodynamics, phase separation, mechanisms, kinetics. (Chapter 7)  
V. Crystalline State of Polymers: Crystallization and kinetics, crystalline structures, experimental methods. (Chapter 13)  
VI. Polymer Viscoelasticity: Stress relaxation, mechanical models of polymer behavior, time-temperature superposition, perhaps rheology. (Chapter 11)
VII. Relaxation and Transitions in Polymers: Polymer relaxation mechanisms, the glass transition, and experimental methods. (Chapter 12)

VIII. Rubber Elasticity: Thermodynamics and Statistical Mechanics of polymer elasticity. (Chapter 10)

IX. Modern Topics in Polymer Science

Grading
Homework 10% (Homework will be assigned and graded periodically)
Mid-term exam 30% (tentative - end of February, 2016)
Final exam 30% (May 3, 2016)
Course Project 30%

A note about the Course Project: Choose a topic concerning the Physical Chemistry of Polymers which interests you. You may discuss the topic with me or ask my advice. Once you select the topic, go to literature and learn about the current state of knowledge in that topic. Write a ~6-8 pages paper describing what you learned, formulating the major challenges and important problems in this topic. You will also present a ~15 minutes talk on the material during the last weeks of classes. Your grade for the Course Project will depend on both, written paper and oral presentation. I will be glad to schedule practice sessions (outside the class time) to help you with the talk and would be glad to read a draft of your paper if you will give me enough time before the due date.