

ME 265-07: Mechanics of Soft Materials

Department of Mechanical Engineering and Materials Science
Edmund T. Pratt, Jr. School of Engineering
Duke University

Spring 2012

Lecture: Tue, Thu 2:50-4:05 Hudson 115A

Instructors: Dr. Xuanhe Zhao xuanhe.zhao@duke.edu 301A Hudson 660-5441

Office Hrs: After class or by appointment

Prerequisites: ME131, CE 202, CEE 255 or an equivalent course in solid mechanics

Reference (Optional):

Zhigang Suo “Lecture notes on Advanced Elasticity” <http://imechanica.org/node/725>

Gerhard A Holzapfel “Non-linear solid mechanics”.

L. R. G. Treloar “The physics of rubber elasticity”.

Paul J. Flory. “Principles of Polymer Chemistry”

Topic:

- Thermodynamics
- Finite deformation
- Rubber elasticity
- Poroelasticity (including polymer gel)
- Viscoelasticity
- Electromechanics
- Instabilities
- Introduction to fracture of polymers

Grading:

Homework and reading assignment	30%
Midterm Presentation	20%
Final Presentation	30%
Final Report	20%

Each student is expected to carry out a project that is closely relative to his/her research. The project should leverage knowledge learned in the class. The midterm presentation, and final presentation and report will be based on the project.