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.*