

# ME 555-05: Solid Mechanics

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

Spring 2013

**Lecture:** Mon, Wed 3:05-4:20 Hudson 222

**Instructors:** Dr. Xuanhe Zhao [xuanhe.zhao@duke.edu](mailto: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):

S.P. Timoshenko and J.N. Goodier, "Theory of Elasticity", McGraw-Hill, New York.

Zhigang Suo "Lecture notes on Solid Mechanics" <http://imechanica.org/node/203>

James Rice "Lecture notes on Solid Mechanics"

[http://esag.harvard.edu/rice/e0\\_Solid\\_Mechanics\\_94\\_10.pdf](http://esag.harvard.edu/rice/e0_Solid_Mechanics_94_10.pdf)

Herbert F. Wang "Theory of Linear Poroelasticity", Princeton University Press

Gerhard A Holzapfel "Non-linear solid mechanics".

L. R. G. Treloar "The physics of rubber elasticity".

## Topic:

- Elements of linear elasticity
- Plane elasticity problems
- Viscoelasticity
- Poroelasticity
- Plasticity
- Fracture mechanics
- Finite deformation and instabilities

## Grading:

Homework and reading assignment	50%
Midterm Exam	30%
Final Presentation and 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.*