

# MA 527 — Spring 2012

## Continuum Mechanics

### Course description

Reviews tensor algebra and analysis; concepts of motion, stress, energy for a general continuum; conservation of mass, momentum, and energy; frame indifference; the second law of thermodynamics; constitutive equations for linear/nonlinear elastic solids and viscous/inviscid fluids; and examples/solutions from fluid dynamics and solid mechanics.

### Prerequisites by topic

Vector calculus. Elementary linear algebra. (Basic knowledge of partial differential equations helpful but not necessary.)

### Basic organization

Meeting time : W: 8-9am F: 3-5pm  
Location : CB 335

### Course staff

Instructor : Prof. Michel Jabbour  
Office : POT 729  
e-mail : jabbour@ms.uky.edu  
Office phone : 257-8836  
Office hours : MWF 3:00–4:00 p.m. and by appointment

*E-mail communication is encouraged. Please put MA 527 in the subject line for faster response. The more specific the inquiry, the more likely you are to receive a useful reply.*

### Textbook

*The Mechanics and Thermodynamics of Continua*, Morton E. Gurtin, Eliot Fried & Lallit Anand, Cambridge University Press, 2010. ISBN-13: 9780521405980

### Contents of textbook to be covered

Most but not all sections in Parts I–V, VIII, IX, and X.

### Homework assignments

Problem sets will be assigned periodically. Students are encouraged to form study groups, but the homework that they submit must be their own work. An unspecified subset of problems from each assignment will be graded.

### Tentative grading scheme

Homework assignments :	30%
Midterm exam :	30%
Final project :	40%

### Tentative schedule

Midterm exam :	Wednesday, March 07 (subject to change if necessary)
Spring break :	Monday, March 12 through Friday, March 16
Last day of class :	Friday, April 27

### Disclaimer

The instructor reserves the right to change or amend this syllabus as he deems necessary, at any time, and for any reason.