

**ESM 2204**  
**MECHANICS OF DEFORMABLE BODIES**

**Fall 2010**

**TEXT:**

Mechanics of Materials 5th Edition, by Beer, Johnston, DeWolf, and Mazurek

**PREREQUISITE:**

ESM 2104 – Statics. Students who do not have the prerequisite will be dropped from the class roll! No exceptions!

**LEARNING OBJECTIVES:**

- a. Calculate stress (normal and shear) in a structure or machine component loaded in various ways
- b. Use stress concentration factors to find stresses in, or allowable loads on, axially loaded members
- c. Calculate normal and shearing strains/deformations for bodies subjected to loads and/or temperature changes
- d. Design members using criteria based on strength and/ or deformation
- e. Solve statically indeterminate problems subjected to one or a combination of axial, torsion and bending loads
- f. Apply Hooke's Law in one, two, and three dimensions
- g. Determine stresses and/or deformations in a circular member subjected to torsional loading
- h. Solve problems using stress transformation equations and Mohr's circle
- i. Calculate stresses in thin-walled pressure vessels
- j. Draw shear and moment diagrams for beams subjected to some combination of concentrated loads, distributed loads, and concentrated moments.
- k. Calculate normal and shearing stresses in beams
- l. Determine the deflections of statically determinate and indeterminate beams using double integration and superposition
- m. Apply Euler's equation to solve buckling problems for various end conditions

**COMMON-TIME FINAL EXAMINATION:**

The Mechanics of Deformable Bodies exam is a common exam, given at a common time, for all students taking this course. The common time for the exam is **Friday, December 10, 7-9pm**. (Classroom assignments for this common-exam will be announced.)

**EXAMPLE FINAL EXAM:**

<http://www.esm.vt.edu>

click on 'Undergraduate Students', then 'Course Listings', then CRN number for ESM 2204, then ESM 2204 sampleexam.pdf

**IMPORTANT DATES:**

**August 27**

**Last day for students to add classes and to add or drop audit option**

**October 1**

**Last day for students to drop Fall 2010 classes without grade penalty**

**December 3**

**Last day to apply for Course Withdrawal**

**C- RULE:**

A growing number of departments are requiring a C- in ESM 2204 before taking subsequent courses in their curriculum. Please note that this is NOT an ESM rule. Any questions or concerns about a C- rule should be directed to your home department.