Syllabus: COE 3001 - Mechanics of Deformable Bodies (Fall 2026)

Lecturer: Dr. Danny Smyl
Office Hours: Wednesdays, 1:00 – 3:00 or by appointment
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Class website: https://canvas.gatech.edu

About this class

The class was designed to provide a basis of knowledge and understanding of structural behavior. Topics will include stress and strain analysis applied to beams, vessels, pipes, and combined loading; stress and strain transformations; beam deflection; column buckling. The following learning objectives will be realized:

- Describe the engineer's relationships between stress and strain, and the nature of normal and shear stress and strain
- Draw Mohr circles of stress and calculate principal stresses in planar systems of stress
- Demonstrate an understanding of how simple beams may be designed for strength or limiting deflections
- Understand the basic theories of plasticity, column behavior and pressurized vessels.

Pre-requisites/Co-requisites

COE 2001 and MATH 2403, 2413 or 24X3.

Textbook (optional)

Mechanics of Materials, 9th Edition, James M. Gere and Barry J. Goodno, Cengage

Course Components and Grading

This module will consist of the following components:

- Lectures (T/Th)
- Tutorials (built into lecture time, assignments are 30% of your grade)
- Midterm exam, **TBD, in class** (30% of your grade)
- Final exam, **TBD** (40% of your grade)

Website

All course material will be posted on Canvas via the front page only.

Lectures
Two lectures will be delivered per week. The content of the lectures will include basic derivations of elastic deformation mechanisms (e.g., stress, strain, and deflection) and practical examples. An emphasis will be placed on conceptual understanding of these mechanisms in order to build a solid foundation for mechanics coursework in the following years. The tentative lecture plan is below.

Tutorials
The purpose of the tutorials is to give students experience in the subject by working out examples and expanding on the material presented in the lectures. Students will be broken up into smaller groups and provided an opportunity to ask questions in order to facilitate learning and break through sticking points. **Assignments will be given during tutorial time and will be due at the beginning of class one week from the tutorial.**

Lecture Week	**Topic**
1	Intro to stress/strain
2	Elastic beam bending
3	Elastic beam bending, cont.
4	Combined bending and axial loads/shear in beams
5	Shear in beams
6	Intro to plasticity
7	Review and Midterm **(TBD)**
8	Elastic beam deflections
9	Elastic beam deflections, cont
10	Stress/strain part 2 (Mohr's circle)
11	Stress/strain part 3 / Conference week (Dr. Smyl out of town)
12	Pressure vessels
13	Intro to stiffness and buckling
14	Class summary and catch up
15	Review
16	Final **(TBD)**

Supporting Resources

Mastering the material for this class while managing a full course load and maintaining your health can be challenging. Georgia Tech provides resources ranging from academic support to personal support, to health care. Some good places to start are the Center for Academic Success (success.gatech.edu), the counseling center (counseling.gatech.edu), and the health service (health.gatech.edu). **Please feel free to email me directly with any serious course concerns you may have, my ultimate aim as an educator is to see you succeed! I do my best to answer emails within 1 business day.**

Office of Disability Services

The Georgia Institute of Technology has policies regarding disability accommodation, which are administered through The Office of Disability Services. http://disabilityservices.gatech.edu/. For students with disabilities, please contact this Office to request accommodations.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit http://www.catalog.gatech.edu/policies/honor-code/ or http://www.catalog.gatech.edu/rules/18/. Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.