AE 3140 Syllabus

Structural Analysis, Section A, 3 Credits

Fall 2026

Instructor Information

Instructor: Kai A. James

Email: kai.james@gatech.edu

General Course Information

Description

This is an introductory course on structural analysis. It will cover the basic equations of elasticity; bending, shearing and torsion of thin walled structures; energy methods for structural analysis; and a brief introduction to finite element theory for trusses and beam structures.

Course Learning Outcomes

Upon successful completion of the course, students should have a firm grasp of ...

- the basic equations of 3D elasticity
- the mechanics of bending, shearing and thin-walled structures
- energy methods for structural analysis
- the basics of numerical solution methods including the finite element method

Required Course Materials

Bauchau O.A., Craig J.I., *Structural Analysis*, Springer, 2009.
Available online through *library.gatech.edu*

Grading Policy:

Final grades will be calculated based on the following allocation.

Homework:	10%
Group Work:	20%
Midterm:	25%
Final exam:	45%

Letter grades will be determined based on the following formula

Grade	Description	Required Course Average (%)
A	Excellent	≥ 90%
B	Good	80-89%
C	Satisfactory	70-79%
D	Passing	50-69%
F	Failure	< 50%

Description of Graded Components

Homework: There will be 6 homework assignments, posted to Canvas approximately every two weeks. The assignments will contain clear instructions on the requirements for each submission. Final solutions may be handwritten or typed, but you must show all your work. You may write Matlab or Python scripts to generate plots, in which case all code must be included in your submission. **Homework will be graded for completeness only**. Students who make an honest attempt to solve every question will receive a grade of 100%, even if the answers are incorrect. Homework assignments are individual assignments, and therefore they should be your own work, not the work of your classmates or AI models. **The penalty for late submissions is 1% per hour up to 48 hours**. Homework submitted more than 2 days after the deadline will not be accepted. All homework assignments will be submitted online via Canvas.

Group Work: There will be 4 "Team Challenge" problems to be solved in groups of four students during class. These problems will be designed to be particularly challenging, and students will have to think laterally to apply the concepts taught in class.

Exams: There will be one midterm exam held during the lecture hour. This exam will be scheduled to take place at roughly the midpoint of the semester**.** There will also be a final exam held during the exam period. All exams will be **closed book and closed notes** and the material covered in each exam will be **cumulative** from the beginning of the semester. An equation sheet will be provided for each exam.

Course Policies

Attendance and/or Participation

Attendance is generally not mandatory. However, students are required to attend lectures on days when there is an in-class group assignment. Participation in these group exercises

is mandatory. The specific dates for these assignments will be announced one to two weeks prior to the date of the assignment.

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. Review Georgia Tech's Honor Code and the student Code of Conduct.

Any student suspected of cheating or plagiarism 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.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.