CEE 3051 Syllabus

Introduction to Structural Engineering, 3 Credits

Fall 2026

Instructor Information

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General Course Information

Description

This course introduces fundamental concepts in structural engineering: the science, art, and skill of designing various types of structures such that their behavior is as intended and they function safely throughout their lifetime. Through case studies of structures and failures, laboratory experiments, and lectures, students will understand how structures of all types (i.e., buildings, bridges, domes, dams, etc.) resist and transfer loads, compute the effects of the loads on the structural members, and determine the material and size of these members such that they are safe.

Course Learning Outcomes

During this course, the student will learn by actively participating in lectures and demonstrations, solving individual homework assignments, and completing engineering projects as part of a small team. After completing the course, the student will be able to:

- Determine the behavior of structural systems subjected to gravity, lateral, dynamic, and other loads
- Represent three-dimensional structural systems as two-dimensional analysis models
- Compute the demand loads on members
- Design basic structural members made of commonly used materials
- Explain the force transfer mechanisms of the structure

Required Course Materials

There is no official textbook for the course. Course notes, homework solutions, and additional course materials will be available on Canvas.

Grading Policy:

The final grade will be determined from the following grading scheme:

- Homework: (20%)
- Projects: (30%)
- Mastery Quizzes: (50%)

A ≥ 90%; B ≥ 80%; C ≥ 70%; D ≥ 60%; F < 60%

Description of Graded Components

Homework

Homework assignments will be posted on Canvas. Please be concise and neat when submitting solutions. All students must submit their own homework assignments. Discussion of homework problems with other class members is encouraged. Utilizing other students' or prior years' homework to directly generate your assignment is prohibited. Excessive similarities between deliverables or deliverables from previous years will receive a zero grade on the homework assignment. All assignments shall be submitted electronically via Canvas. Late homework is accepted ***with a 25% markdown per day,*** up to two days. No late homework will be accepted after the solutions are posted online. Late homework due to medical reasons will be considered with a doctor's note. Extensions for religious reasons, medical issues, or any other Institute-approved absence should be requested as soon as possible before the homework is due.

Projects

Projects will be assigned throughout the semester (2 – 4 total). Each project will have reports and/or other deliverables. Excessive similarities between deliverables or deliverables from previous years will receive a zero grade on the project. Project topics may include:

1. Structural Failures
2. Trusses
3. Structural Dynamics

Make-up for projects completed during class will only be granted in exceptional circumstances and must be requested before the due date. Attendance may be taken during these classes to ensure fair participation of all group members.

Mastery Quizzes

Students must successfully master concepts in six areas, each representing ~8% of the final grade:

1. Tributary Areas and Load Paths
2. Moment and Shear Diagrams
3. Axial Stresses, Strains, and Material Behavior
4. Trusses
5. Flexure and Shear
6. Deflected Shapes

Points	Performance	Examples
4	Complete Mastery	All questions were answered correctly and completely
3	Minor Errors	Numerical errors; Minor units issue(s)
2 1 0	Major Conceptual Error 2 Major Conceptual Errors 2+ Conceptual Errors	Incorrect approach; Incorrect equation(s); Incorrect use of equation(s); Major unit error
0	No / Incomplete Response	Did not attend quiz; did not attempt all parts of the quiz

Students must complete a ~25-minute quiz of 1 to 2 problems to demonstrate mastery of each concept. Quizzes will be graded using the following rubric out of a total of 4 points:

Students must take the first offering of the quiz in class. If the student does not receive a 4 (Complete Mastery) grade, they must retake each quiz up to two additional times during the semester: once during a regular lecture (as indicated in the schedule) and once during the final exam period. Retakes should be viewed as part of the learning process. Once the student has received a 4, their grade will be recorded at 100%, and they do not need to sit for the remaining quizzes of that subject. *If the student does not receive a 4 on their third attempt, the three grades will be averaged for their final grade.*

Each quiz has numerous versions, and students should expect different questions on each attempt. Additionally, all students may not receive the same quiz during the same sitting.

Cheating from another student's quiz is unethical and unacceptable. Other examples of cheating include, but are not limited to, using unauthorized material during a quiz, collaborating, sharing notes, talking during a quiz, or using cell phones. Cheating is a direct violation of the Georgia Tech Academic Honor Code and will be dealt with per Georgia Tech policy.

Course Policies

Attendance and/or Participation

Students are expected to attend all lectures. Active participation is highly encouraged in all aspects of the course. Please notify the instructor well in advance of any known absences from class, specifically as related to quiz days.

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.

Use of Generative Artificial Intelligence (AI) Tools

Generative AI programs (e.g., ChatGPT) may be used in this course with instructor approval on specific assignments. Please be aware that the material generated may be inaccurate, incomplete, biased, or otherwise problematic. Per the Georgia Tech Honor Code, you may not submit any work generated by an AI program as your own. When submitting material generated by an AI program, it must be properly cited like any other reference material.

Recordings of Class Sessions and Required Permissions

Due to the increased use of distance learning, our class sessions may be audio-visually recorded for use by enrolled students. Any class recordings, lectures, and other classroom presentations delivered via video conferencing, as well as materials posted on Canvas, are for the sole purpose of educating the students enrolled in the course. Students may not record or share recordings, including screen capturing, unless the instructor states so or individual permission is obtained.

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.