COE 3001 Syllabus

Mechanics of Deformable Bodies, Section R, 3 Credit Hours

Summer 2026

Instructor Information

Instructor: Dr. Alexia Payan

Email: See Oscar Website

General Course Information

Description

This document provides basic information regarding the "Mechanics of Deformable Bodies" class for the Summer 2026 academic term at Georgia Tech Europe. The course is listed as COE-3001 for 3-credit hours in the course catalogue of the Georgia Institute of Technology. The class will take place twice a week for 1h and 55 minutes on Mondays and Wednesdays between 8am and 9.55am in the Pink Classroom of the GT-Europe building, unless otherwise specified by the instructor.

The goal of this class is to use statics (free body diagram(s) and equilibrium equations), and material properties (constitutive relationships) to learn about the deformation of solids in 1D and 2D, and to solve practical problems.

The lectures will supplement reading chapters in the textbook and will cover essential material related to the topics described below. The lectures will be supported by several homework assignments. There will be a midterm exam and a final exam in this course. Due to the accelerated pace of the summer session, students should, on average, expect to spend 5–8 hours on homework and material reading per week. Those who are less comfortable with trigonometry and vectors should be prepared to spend more until they become comfortable with the pre-requisites.

Course Learning Outcomes

Upon successful completion of this course, you will:

1. Be able to visualize and understand the fundamental behavior of structures and solids
2. Understand assumptions and idealizations commonly used for analysis of structures and solids
3. Understand and apply methods for computing stresses in several types of structural components
4. Understand and apply the fundamental approach for determining internal forces and stresses in indeterminate structures

Required Course Materials

Textbook: Goodno, B.J. and Gere, J.M., Mechanics of Materials, 9th Edition, Cengage, 2017.

Bookstore Link: https://gatech.bncollege.com/course-material/course-finder

Pre- &/or Co-Requisites

COE 2001 Statics (or equivalent, minimum grade C), MATH 2403, 2413 or 24X3 (co-requisite OK)

Topics

Introduction, Problem Solving Procedure
Stress and Strain
- Definition of stress and strain
- Stress-strain diagrams
- Elasticity, plasticity and Hooke's Law

Axial Deformation
- Deformation of axially loaded members
- Statically indeterminate structures
- Thermal deformation

Torsion
Shear Force and Bending Moment Diagrams
Stresses in Beams
- Normal stress in beams

Properties of sections
Shear stress in beams
Principal stresses in beams

Combined Stresses

Beams under bending and axial loading

Analysis of Stress and Strain

Principal stresses
Maximum shear stress
Mohr's circle
Principal strains, maximum shear strain

Beam Deflection

Curvature and beam deflection equation
Boundary conditions
Statically indeterminate beams
Energy methods

Column Buckling

Energy and equilibrium
Buckling of columns with different boundary conditions
Eccentric loading and imperfection
Secant formula

Class Website

The official website for this class is on ***Canvas*** at canvas.gatech.edu. This website is intended to provide lecture materials, assignments, notices, and relevant information. Note that the website will be continuously updated and must be checked on a regular basis. All class website announcements are automatically emailed to students' GT accounts. It is the student's responsibility to maintain access to this account and address email filtering issues.

To log in, students use their GT account username (usually their first name initial followed by the last name and a number, e.g., gburdell3) and password. Once on Canvas, the COE3001 class must be selected to navigate to the specific section for the class.

Grading Policy

Grades will be determined by your mastery of the subject, not by your relative performance with your peers. Your minimum grade will be according to the following scale (for a grade of X):

A	if	$90\% \leq X \leq 100\%$
B	if	$80\% \leq X < 90\%$
C	if	$70\% \leq X < 80\%$
D	if	$60\% \leq X < 70\%$
F	if	$X < 60\%$

Grades will be based on class attendance measured via in-class quizzes, homework assignments, take-home exams, a midterm exam, and a final exam.

Description of Graded Components

The ***in-class quizzes*** will be 10 to 20 minutes long and randomly spread throughout the semester. They will serve to measure class attendance, as well as assess understanding of the material taught during previous classes and read in the textbook.

Individual ***homework assignments*** will be assigned every week or every other week, and will consist of a few problems. There will be ***five in total***. Homework assignments will be released after class on a Wednesday, and will be due at 11.59pm local time the next Wednesday.

Individual ***take-home exams*** will be longer than homework assignments. There will be ***two in total***. They will be released after class on a Wednesday, and will be due at 10am local time the following Friday.

A ***midterm exam*** will be administered in the middle of the semester to test knowledge acquired in the first half of the semester, while a ***final exam*** will be administered at the end of the semester to test knowledge acquired in the second half of the semester. Both exams will be closed-book, closed-notes. An equation sheet may be provided or created for use during the exams.

A tentative schedule of homework assignments, take-home exams, as well as midterm and final exams is provided in the "Tentative Class Schedule" section.

Assignments Weights:

- Total for Class Attendance/In-Class Quizzes: 10%
- Total for Homework Assignments: 30%
- Total for Take-home exams: 20%
- Midterm Exam: 20%
- Final Exam: 20%

Extra Credit Opportunities

Occasionally, when a research question comes up during class, students may volunteer to research the question and do a short 5 min presentation of their findings at the beginning of the next class. These students who volunteer will be eligible for a 2% bonus on their overall grade, not to exceed 10%.

Occasionally, students may be asked to solve simple example problems in class. Students who volunteer to do so will be eligible for a 2% bonus on their overall grade, not to exceed 10%.

These two extra credit opportunities are non-cumulative, but may be mixed.

Office Hours

Office hours will be held virtually and in-person simultaneously during the Summer semester on Tuesdays between 10am and 12:00pm. Physical location will be provided at the beginning of the Semester and communicated via CANVAS. When official institute holidays conflict with office hours, alternate arrangements will be made. Meetings during office hours are by appointment using Microsoft Bookings. Each appointment is 10 minutes

long and students can book multiple consecutive appointments for a longer discussion.

Course Policies

Attendance and/or Participation

Class preparation, attendance, and participation are essential for you to learn the material and to successfully complete quizzes, exams, and homework assignments. This will be an active classroom. You will be expected to attend and participate.

In cases where you need to miss a class, be prepared to present an institute-approved excuse well in advance (for Georgia Tech official activities), or as soon as you can (for health issues).

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. It is the responsibility of students to become familiar with the Honor Code and be aware of rules and expectations. For any questions regarding the Honor Code, students can contact a representative of the Honor Advisory Council of the Institute. Violations to the Honor Code have serious consequences.

Collaboration, Group Work, and Use of Generative AI

Learning happens when you attempt to perform the work yourself, not when you hear it in class. For all out-of-class assignments (homework and take-home exams), you may discuss solution strategies with classmates. However, all submitted work must be your own and all work for this course is governed by the Georgia Tech Honor Code. As a guideline, if you are working independently from someone else, you will not be both looking at the same piece of paper or computer screen.

Students are not allowed to create text or code using generative machine learning models for any of their graded out-of-class assignments. All text turned in for grading must be students' own work, i.e., model-generated text must never be copied into documents to be turned in for grading even if edited. Students are reminded that they are attending school to learn new skills and methods and they should focus on attaining them rather than looking for shortcuts that are easily noticeable and reflect badly on their work ethic. Any detection of auto-generated text or code will be subject to penalties in accordance with institute

policies established by the Office of Student Integrity. If students have questions about legitimate uses of such tools, they must contact the instructor for clarifications.

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

Unless announced otherwise, out-of-class assignments (homework and take-home exams) must be turned in via Canvas, in PDF format, as a single file. ***Assignments received after they are due are late and will not be accepted***.

Homework assignments will be released after class on a Wednesday, and will be due at 11.59 pm local time the next Wednesday. Homework assignments turned in late will not be accepted.

Take-home exams will be released after class on a Wednesday, and will be due at 10 am local time the following Friday. Take-home exams turned in late will not be accepted.

For the midterm and the final exams, to maintain grading consistency and fairness, it will not be generally possible to make up an exam or take it at another time, except in very specific cases for Georgia Tech official activities and religious observances or for health issues with supporting documentation. Read more about approved exceptions. In those cases, the score for the exam taken will also count for the affected exam.

Additional Course Policies

Students may ask for a homework assignment or a take-home exam to be re-graded if they feel grading errors have been made. In this case, the entire assignment will be re-graded.

No recording of any kind is allowed during the class.

Cell phones need to be in silent/Do Not Disturb (DND) mode and put away during the class.

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.

Tentative Class Schedule

The official school calendar of Georgia Tech Europe is provided at https://europe.gatech.edu/en/pick-your-semester/summer-2026/summer-2026-calendar. The following schedule is subject to change depending on topic progress and unforeseeable circumstances. Students will be given advance notice of any schedule change on CANVAS.

Week 1	Lecture 1	Wed. May 20	
	Lecture 2	Fri. May 22	*Statics Knowledge Quiz*
Week 2	Lecture 3	Wed. May 27	
	Lecture 4	**Fri. May 29**	**Take-home exam due at 10 am local time**
Week 3	Lecture 5	Mon. June 01	
	Lecture 6	Wed. June 03	*Homework # 1 due at 11:59pm*
Week 4	Lecture 7	Mon. June 08	
	Lecture 8	Wed. June 10	*Homework # 2 due at 11:59pm*
Week 5	Lecture 9	Mon. June 15	
	Lecture 10	Wed. June 17	*Homework # 3 due at 11:59pm*
Week 6	Lecture 11	Mon. June 22	Lecture and Review for Midterm
	Exam	**Wed. June 24**	**Midterm Exam**
Week 7	Lecture 13	Mon. June 29	
	Lecture 14	Wed. July 01	*Homework # 4 due at 11:59pm*
Week 8	Lecture 15	Mon. July 06	
	Lecture 16	Wed. July 08	
	Lecture 17	**Fri. July 10**	**Take-home exam due at 10 am**
Week 9	Lecture 18	Wed. July 15	
Week 10	Lecture 19	Mon. July 20	
	Lecture 20	Wed. July 22	*Homework # 5 due at 11:59pm*
Week 11	Lecture 21	Mon. July 27	
		Wed. July 29	Reading Day
Week 12	**Exam**	**July 30 – Aug 6**	**Final Exam**

Campus Resources for Students

Undergraduate Student Academic Success Resources:

A list of resources for undergraduate students' academic success and information about advising can be found at Success at Tech.

Student Well-Being:

At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A comprehensive list of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being (student-resource-guide (gatech.edu)

Georgia Tech understands that many students experience stress through a variety of academic, financial, and personal experiences. There are useful resources that are available to students should they need them. The well-being and mental health of students are important to the faculty and institute, and these resources are always available for students to discuss stress or similar issues. Student should feel free to contact their instructors, if they are feeling overwhelmed by course work and the instructors will make fair arrangements to alleviate the stress. There are numerous resources to support the mental health of all members of the Georgia Tech community:

- Center for Assessment, Referral and Education (CARE)
- Campus Police (any emergency): 404-894-2500
- Counseling Center: 404-894-2575
- Collegiate Recovery Program
- Stamps Psychiatry
- Vice President and Dean of Students Office and Student Referral Form
- Dean of Students Office: 404-894-6367
- Georgia Crisis and Access Line: 1-800-715-4225
- 988 Suicide & Crisis Lifeline: 988 or 1-800-273-TALK (8255) / France Number: 3114
- Crisis Text Line: Text HOME to 741741
- VOICE: Victims Survivor Support: 404-894-9000
- Stamps Health Services
- Georgia Tech Mental Health Website

Accommodations for Students with Special Needs

Student experience in this class is important to the instructors. If students have already established accommodation with the Office of Disability Services, they are expected to

communicate their approved accommodations to the instructor at their earliest convenience to discuss needs in this course.

If they have not yet established services through Disability Services, but have a temporary health condition or permanent disability that requires accommodation (conditions include but not limited to mental health, attention-related, learning, vision, hearing, physical or health impacts), students should contact the Office of Disability Services at 404-894-2563 or dsinfo@gatech.edu.

Disability Services offers resources and coordinates reasonable accommodation for students with disabilities or temporary health conditions. Reasonable accommodation is established through an interactive process between the student, the instructor(s), and Disability Services. It is important to the Georgia Institute of Technology to create an inclusive and accessible learning environments consistent with federal and state laws.