GEORGIA INSTITUTE OF TECHNOLOGY
COE 2001M STATICS
Fall 2026

Instructor: Prof. Shuman Xia; MRDC 4103; e-mail: shuman.xia@me.gatech.edu

Prerequisite: MATH 1552 Integral Calculus (minimum grade C) and PHYS 2211 Introduction to Physics I (minimum grade C)

Textbook and Required Course Materials:

Engineering Mechanics: Statics by J. L. Meriam, L. G. Kraige, and J. N. Bolton, Wiley, 9th Edition, 2018. ISBN: 9781119392743.

A WileyPlus registration/access code is required for online homework.

Web Resources:

Announcements, changes, and handouts will be posted on Canvas at https://canvas.gatech.edu/. All homework assignments and solutions will be available on https://www.wileyplus.com. Please check these websites frequently.

Course Description:

This course provides an introduction to statics of rigid bodies with applications to science and engineering. Vector analysis will be introduced as a convenient tool to solve many problems. Students will develop their ability to analyze statics problems in a simple and logical manner, and to apply to their solutions a few well understood basic principles. By the end of the course you are expected to be able to address the following topics:

Forces and Moments
Free Body Diagrams (FBDs)
Equilibrium in 2D and 3D
Centroids
Friction

Course Outcomes:

Outcome 1: Students will understand the basic principles underlying the equilibrium of rigid bodies in planar and 3D spaces.

Students will demonstrate an ability to apply fundamental rigid-body mechanics concepts to set up and solve engineering mechanics problems such as equilibrium and force-balance problems for single and assemblies of rigid bodies.

Outcome 2: Students will learn to identify, formulate, and solve engineering problems in rigid-body statics.

2.1 Students will demonstrate the ability to isolate rigid bodies and to draw clear and appropriate free body diagrams.

2.2 Students will demonstrate an ability to apply skills in mathematics and physics to solve engineering mechanics problems.

2.3 Students will demonstrate an ability to identify appropriate supports and static knowns and unknowns, in both 2D and 3D structures.

2.4 Students will demonstrate that they can apply the appropriate principles referred to in Outcome 1 to the solution of problems.

Homework:

Homework problems will be assigned weekly through https://www.wileyplus.com. All problems will be completed and graded online. To register an account at WileyPlus, you need a registration code that comes with your textbook. Please see the attached flyer and learn about the registration process.

You must complete your homework on time to receive full credit. There is a 40% penalty for assignments submitted after the due date. The lowest homework score will be dropped automatically.

Exams:

There are two midterm exams and one final exam. All exams will be closed-book and closed-notes. For each midterm exam, you may bring one page of handwritten crib notes, written on standard 8.5" x 11" paper, single-sided. For the final exam, you may bring two pages of handwritten crib notes, either as two single-sided pages or one double-sided page, on standard 8.5" x 11" paper. Notes may be written by hand directly on paper or created digitally (for example, using a tablet) and then printed. However, typed or typeset notes are not allowed.

The midterm exams serve as a useful tool for both you and me to assess your progress in the course. There will be no make-up exams for the midterms. If a midterm is missed due to a valid and documented excuse, the final exam score will be used as a substitute. Make-up exams for the final will only be considered in exceptional, well-documented circumstances.

Calculators (programmable or not) are permitted during exams; however, the use of smartphones, iPads, laptops, or tablets is strictly prohibited.

Lecture Outline:

Introduction (1.1-1.8)
Particle Equilibrium
- Components of a Force (2.1-2.3, 2.7)
- Particle Equilibrium (3.1, 3.3)
- Free-Body Diagrams (3.2)

Moments and Resultants
- Cross and Dot Products (2.4, 2.7)
- Moment about a Point (2.4, 2.5, 2.8)
- Moment about a Line (2.8)
- Equivalent Systems (2.6, 2.9)

Analysis of General Equilibrium Problems
- Equilibrium in 2D and 3D (3.3, 3.4)
- Distributed Loads (5.6, 5.7)

Centroids and Center of Gravity
- Centroids and CG (5.1-5.3)
- Composite Bodies (5.4)

Structural Applications
- Plane Trusses (4.1-4.4)
- Frames (4.6)

Friction (6.1-6.3)

Attendance Policy:

Class attendance is mandatory. Students are expected to attend lectures and recitations regularly, arrive prepared, and remain responsible for all course material and announcements. Documented excuses include communications from the Dean of Students and approved Institute activities.

Absences for Medical Reasons:

In the event of a medical emergency or an illness severe enough to require medical attention, students are responsible for contacting the Office of the Dean of Students as soon as possible to report the issue, provide dated documentation from a medical professional, and request assistance in notifying their instructors. All medical documentation will be handled confidentially by the Dean's office and will be used to determine whether communication with instructional faculty is appropriate. In short, students will work with the Office of the Dean of Students to verify their illness, and the Dean's office will then communicate with me as needed.

Grading:

Homework 12%
Midterm Exam 1 24%
Midterm Exam 2 24%
Final Exam 40%

Scale:

Final scores will be calculated as the weighted average of the above components, and mapped into letter grades based on a class distribution curve. The mapping is not more demanding than a scale of A: 90 or above; B: 80 or above; C: 70 or above; D: 60 or above; F: below 60.

Academic Integrity:

You are allowed to work on homework problems with other students in the class. However, assignment solutions that you turn in should reflect your own understanding, and not that of your fellow students. The midterm and final exams are to be completed alone. 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 https://catalog.gatech.edu/policies/honor-code/ or https://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.

Additional Criteria for Successful Completion of the Course:

Complete all required homework and exams in accordance with the course schedule unless an approved exception is granted.

For all midterm and final exam work that is submitted for grading, if part of the work is missing, incomplete, or not presented in an understandable way, you will get little or no partial credit.

The most important part when solving any problem is showing all steps of your solution, including free-body diagrams and force-equilibrium statements.

Students are responsible for monitoring Canvas, WileyPlus, and Georgia Tech email for course communications and updates.

Acceptable Student Conduct (Student-Faculty Expectations Agreement):

At Georgia Tech, it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. Students are expected to contribute to a respectful, professional, and engaged learning environment and to follow the Student-Faculty Expectations Agreement.

Additional resources:

I want you to do well in this course, and will do whatever I can to help you. If you have any questions or concerns, please feel free to email me or come to see me. Some additional resources you can utilize are:

Success Programs Tutoring (https://success.gatech.edu/)
OMED (https://omed.gatech.edu/)

Diversity and Disability Statement:

Georgia Tech values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive, and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment or achievement, please notify the instructor as soon as possible. Students with disabilities should contact the Office of Disability Services to discuss options for removing barriers in this course, including accommodations. ODS can be reached at 404.894.2563, dsinfo@gatech.edu, or https://disabilityservices.gatech.edu.

Core IMPACTS Statement:

This is a Core IMPACTS course in the Technology, Mathematics, and Sciences area of the USG core curriculum. Core IMPACTS refers to the core curriculum, which provides students with essential knowledge in foundational academic areas.