

## COE 2001 Section C: STATICS

Fall 2024, MW 2:00 – 2:50 PM, Kendeda 230

**Instructor:** Prof. Edvard Bruun, [edvard.bruun@gatech.edu](mailto:edvard.bruun@gatech.edu)  
Office: Mason 3140A  
Office Hours: Monday & Wednesday, 4:00 – 5:00 pm, or by appointment

**Assistants:** Chisung Kim (TA), [chisung.kim@gatech.edu](mailto:chisung.kim@gatech.edu)  
Office Hours: Friday, 3:00 – 4:00 pm, Mason 1201A (breakout room)

Isabella Monfort (LA), [imonfort@gatech.edu](mailto:imonfort@gatech.edu)  
Office Hours: Tuesday, 3:30 – 4:30 pm, Mason 1201A (breakout room)

**Textbook:** *Engineering Mechanics: Statics* by J.L. Meriam, L.G. Kraige, and J.N. Bolton. 9<sup>th</sup> Edition, Wiley, 2018 (Electronic or hardcover editions of the textbook are acceptable.)

WileyPLUS online system will be used for homework assignments, access our section through Canvas. You must purchase a WileyPLUS access code through the canvas page or through the bookstore.

**Importance of this Course:** This course is fundamental for any engineering specialization. To design a useful, safe, and efficient structure or machine, an engineer must have a strong grasp of the theory and application of statics. COE 2001 focuses on developing theoretical knowledge to solve problems in statics, while also enhancing your general engineering problem-solving skills necessary for all your future courses.

**Pre-requisites:** MATH 1502, MATH 15X2, MATH 1512, or MATH 1552; PHYS 2211 or 2231

### Main Course Objectives:

- Visualize and model the fundamental behavior of rigid bodies.
- Sketch free-body diagrams of any object and solve the related equilibrium equations.
- Deconstruct complex engineering problems into smaller, simpler, components for static analysis in both 2D and 3D spaces.
- Apply the fundamental principles of statics to analyze various types of everyday engineering structures and machines (e.g., planar trusses, frames, beams).

### Course Format:

- COE 2001C will be residential. I expect you to attend and actively participate through in-class discussion and problem-solving.
- Approximately half of each class will be dedicated to lecturing and half will be dedicated to solving problems and discussion.
- Canvas will be the website for this course. All assignments, lecture notes, and general course material will be available through Canvas.

<b>Grading:</b>	Homework (10)	20% (= 10 x 2% each)
	In-Class Quizzes (4)	80% (= 4 x 20% each)
	Final Exam (1)	40% (optional, see below)
	Extra Credit Assignments (3)	3% (= 3 x 1% each)

Your final grade will be assigned as a letter grade according to the following scale. Thresholds for letter grades may be lowered at my discretion to pick you up a letter grade if you are close to the boundary and have been actively participating in the course throughout the semester:

A	85-100%
B	75-84%
C	65-74%
D	55-64%
F	0-54%

Grade disputes must be submitted to me within two weeks of the assignment or exam being returned to you, except for Quiz 4, for which a dispute must be submitted to me by 12/06/2024.

### **Homework:**

There will be 11 weekly homework assignments that must be completed and submitted through Canvas using WileyPLUS. Additionally, you need to create a PDF of your work and upload it under the corresponding "Homework #X Completion" assignment on Canvas to receive credit. Your work should be neat, concise, and clearly demonstrate your thought process.

All homework is due by 11:59 PM on the date specified in the syllabus and on Canvas. Typically, assignments will be given after the Wednesday lecture when the relevant material is covered and will be due the following Wednesday, approximately seven days later. This schedule allows you to attempt the homework on your own over the weekend and then use the following week's office hours to ask questions and seek assistance from Prof. Bruun and the TAs/LAs before submitting your assignment.

Homework scores will be based on both correctness and completeness, with 50% of the grade for each. Correct answers will have a tolerance level set by WileyPLUS to account for rounding errors. Homework assignments submitted up to 24 hours late will be accepted but graded at half credit.

Only your top 10 homework grades will be considered, so if you are satisfied with your overall homework grade by the end of the semester, the 11th assignment will be optional.

### **In-Class Quizzes:**

There will be four closed-book in-class quizzes. For each quiz, you may prepare one single-sided, 8.5x11" handwritten notes sheet. This sheet should contain summaries of concepts, procedures for solving problems, and equations. However, fully worked-out example problems are not allowed. If your notes sheet includes any example problems, your quiz grade will be subject to a 50% penalty. Notes sheets will be collected with your exams and returned along with your graded quizzes. You may use any calculator that does not have internet capability during the quizzes.

**Final Exam:**

The final exam will be comprehensive and will take place on December 11th from 2:40 to 5:30 PM in Kendeda 230 (the same classroom as the lectures). You may use two single-sided, 8.5" x 11" handwritten notes sheets. The same restrictions that apply to the midterm exam notes sheets also apply to the final exam notes sheets.

If you have a grade of C or higher in the course before the final exam, you may choose to skip the final exam. If you qualify for this exemption, I will notify you prior to the start of the final exam period on 12/05/2024.

Additionally, if you are not exempted or choose to take the final exam, and your final exam grade is higher than your lowest two midterm exam grades, the final exam grade will replace the lowest two midterm exam grades.

**Extra Credit:**

Three different extra credit assignments will be posted to Canvas. Each assignment will be worth up to +1% on your final grade, for a possible total of +3% on your final grade. A final grade above 100% will be rounded down to 100%.

**Teaching Resources:**

For COE2001C, in addition to Prof. Bruun, you'll have access to both a graduate student Teaching Assistant (TA) and a Learning Assistant (LA) to support you throughout the course.

TAs, who are typically graduate students, will hold office hours to help with course materials, grade assignments and exams, and may also lead certain lectures.

LAs are undergraduate students who have recently completed the course with an A. Their experience as undergraduates allows them to offer unique insights and connect more closely with students. They play a key role in facilitating active learning and collaborative instruction, whether during lectures or in outside-of-class recitations.

Both the TA and LA for this course will hold additional office hours alongside those of Prof. Bruun. They will also lead optional out-of-class recitations, such as reviewing sample solutions before in-class quizzes.

### **Attendance and Participation:**

While there are no formal institutional requirements regarding class attendance at Georgia Tech, the resources of the Institute are provided to support your intellectual growth and development. I expect you to attend this course regularly and actively participate in in-class exercises and discussions, as these activities significantly enhance your educational experience. However, I believe that as future professional engineers, you are responsible for deciding how to allocate your time during the workday, so attendance for my course will not be monitored or policed.

Attendance is only required for the scheduled in-class quizzes (see schedule for the dates). Please let me know as soon as possible if you will a quiz for an excused absence. You can find the Institute policies for excused absences here: <https://catalog.gatech.edu/rules/4/>.

### **Illness and Extenuating Circumstances:**

Your health and the health of the class are of the utmost importance to me; please stay home if you are sick. I will work with you on reasonable accommodations to make up notes, homework assignments, or exams that are missed due to illness (with a Doctor's note submitted through the appropriate Institute channels) or other extenuating circumstances..

### **Academic Integrity:**

You are allowed—and encouraged—to collaborate with your classmates on in-class and homework assignments. Feel free to ask questions and seek guidance from me and the assistants as you work through your problem solutions. However, copying from other students or any external sources (e.g., solution manuals, third-party services, or any resources not provided by the class) is a violation of the Georgia Tech Honor Code. For information on Georgia Tech's Academic Honor Code, please visit

- <http://www.catalog.gatech.edu/policies/honor-code/>
- <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: <https://osi.gatech.edu>

### **Accommodations for Students with Disabilities:**

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404) 894-2563 or <http://disabilityservices.gatech.edu/>, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also email me as soon as possible to set up a time to discuss your learning needs.

### **Diversity and Inclusion:**

I believe the classroom should be a place where everyone is treated with dignity and respect. I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, abilities, and other visible and invisible differences. All class members are expected to help create a respectful, welcoming, and inclusive environment for everyone.

**COE 2001C Course Topics**

1. Introduction
2. 2D Force Systems
3. Free Body Diagrams
4. 2D Equilibrium
5. Vector Operations
6. 3D Force Systems
7. 3D Equilibrium
8. Plane Trusses
9. Frames and Machines
10. Centroids and Composite Bodies
11. Beams
12. Friction

**COE 2001C Homework and Quiz Topics**

HW #1: Introduction

HW #2: 2D Force Systems

HW #3: Free Body Diagrams/2D Equilibrium

Quiz # 1: Covers topics 1-4 and everything from HW #1 – HW #3

HW #4: Vector Operations

HW #5: 3D Force Systems

HW #6: 3D Equilibrium

Quiz #2: Covers Topics 5-7 and everything from HW #4 – HW #6

HW #7: Plane Trusses

HW #8: Frames and Machines

Quiz #3: Covers Topics 8-9 and everything from HW #7 – HW #8

HW #9: Centroids and Composite Bodies

HW #10: Beams

Quiz #4: Covers topics 10-11 and everything from HW #9 – HW #10

HW #11: Friction (optional)

Final Exam: Comprehensive (Optional for student with C and above in course)

**COE 2001C Tentative Lecture Schedule (may be subject to change):**

#	Date	Day	Topic	Textbook Sections	HW assign	HW due
1	08/19	M	1. Introduction	1/1 – 1/2 & 1/4 – 1/8	HW #1	
2	08/21	W	2. 2D Force Systems	2/3 – 2/6		
3	08/26	M	2. 2D Force Systems	2/3 – 2/6	HW #2	HW #1
4	08/28	W	3. Free Body Diagrams	3/2		
	09/02	M	<b>LABOR DAY – NO CLASS</b>			
5	09/04	W	4. 2D Equilibrium	3/1 & 3/3	HW #3	HW#2
6	09/09	M	4. 2D Equilibrium	3/1 & 3/3		
7	09/11	W	5. Vector Operations	1/3 & Appendix C/7	HW #4	HW #3
8	09/16	M	<b>IN-CLASS QUIZ #1 – Topics 1,2,3 &amp; 4</b>			
9	09/18	W	6. 3D Force Systems	2/7 – 2/9	HW#5	HW #4
10	09/23	M	6. 3D Force Systems	2/7 – 2/9		
11	09/25	W	7. 3D Equilibrium	3/4	HW #6	HW #5
12	09/30	M	7. 3D Equilibrium	3/4		
13	10/02	W	8. Plane Trusses	4/1 – 4/4		HW #6
14	10/07	M	<b>IN-CLASS QUIZ #2 – Topics 5,6 &amp; 7</b>			
15	10/09	W	8. Plane Trusses	4/1 – 4/4	HW #7	
	10/14	M	<b>FALL BREAK – NO CLASS</b>			
16	10/16	W	8. Plane Trusses	4/1 – 4/4		
17	10/21	M	9. Frames and Machines	4/6		HW #7
18	10/23	W	9. Frames and Machines	4/6	HW #8	
19	10/28	M	10. Centroids & Comp. Bodies	5/1 – 5/4		
20	10/30	W	10. Centroids & Comp. Bodies	5/1 – 5/4	HW #9	HW #8
21	11/04	M	<b>IN-CLASS QUIZ #3 – Topics 8 &amp; 9</b>			
22	11/06	W	11. Beams (External Effects)	5/6		
23	11/11	M	11. Beams (Internal Effects)	5/7		HW #9
24	11/13	W	11. Beams (Internal Effects)	5/7	HW #10	
25	11/18	M	12. Friction	6/2 – 6/3		
26	11/20	W	12. Friction	6/2 – 6/3	HW #11	HW #10
27	11/25	M	<b>IN-CLASS QUIZ #4 – Topics 10 &amp; 11</b>			
	11/27	W	<b>THANKSGIVING – NO CLASS</b>			
28	12/02	M	Review for Final	All topics		HW #11
	12/11	W	<b>FINAL EXAM: KENDEDA 230 (2:40 – 5:30 PM)</b>			