

# Engineering Mechanics: Statics

EGM 2511 Section 23586 (224F)

## Class Periods:

Tuesdays Period 4 (10:40 am–11:30 am)

Thursdays Periods 4–5 (10:40 am–12:35 pm)

**Location:** MAE-A room 303

**Academic Term:** Fall 2025

## Instructor:

Dr. Kerry Costello, Assistant Professor

[k.costello@ufl.edu](mailto:k.costello@ufl.edu)

(352) 392-0800

All course communication should be done via Canvas: <https://elearning.ufl.edu/>.

Office Hours: Wednesdays 2:30 – 3:30 pm\* in Dr. Costello's office (WERT 482)

## Teaching Assistant/Peer Mentor/Supervised Teaching Student:

- Names, office hours, and locations will be posted on Canvas
- All TA contact should occur through Canvas

## Course Description

**EGM 2511 Engineering Mechanics: Statics** 3 credits

Reduction of force systems, equilibrium of particles and rigid bodies, vector methods and their application to structures and mechanisms.

## Course Pre-Requisites / Co-Requisites

**Pre-requisite:** PHY 2048 Physics with Calculus 1

**Corequisite:** MAC 2313 Analytic Geometry and Calculus 3

## Course Objectives

- Students understand and appreciate the relationship between the underlying principles of mechanics and the behavior of static mechanical systems.
- Students can represent physical bodies and restraints as idealized statical systems.
- Students understand the relationship between natural forces and how to properly model them.
- Students can analyze particles and rigid bodies subjected to external forces using analytical means and numerical methods.
- Students can use vector methods and free body diagram development as tools to logically approach and solve engineering mechanics problems in both the SI and U.S. customary systems.
- Students can apply the principles of statics to systems in the context of design or other similar engineering contexts.
- Students advance their abilities to solve engineering problems and to communicate the outcomes of technical investigations.
- Students will be prepared for more advanced study of engineering mechanics.

## Materials and Supply Fees

None

## Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. An ability to apply engineering design to produce solutions that meet specified needs with	Low

consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	
3. An ability to communicate effectively with a range of audiences	Low
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	Low
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	

\*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

### **Required Textbooks and Software**

- Title: Modified Mastering Engineering Mechanics: Statics\*
- Author: R.C. Hibbeler
- Publication date and edition: 15<sup>th</sup> Edition (2021)
- ISBN number: 9780134867298
- Available through UF All Access (<https://www.bsd.ufl.edu/allaccess/>)

\*Note: The Mastering online platform includes access to an electronic version of the textbook. **You do NOT need to purchase a separate book. However, you ARE required to purchase access to the Mastering platform—** assignments will be submitted through this platform. Purchasing information is available at the link above.

### **Recommended Materials**

- A calculator capable of trigonometry functions. Phones may not be used as calculators.

### **Required Computer**

Recommended Computer Specifications: <https://it.ufl.edu/get-help/student-computer-recommendations/>  
 HWCOE Computer Requirements: <https://www.eng.ufl.edu/students/advising/fall-semester-checklist/computer-requirements/>

### **Course Schedule**

Below is a tentative course schedule subject to change. A more detailed and up-to-date schedule, including readings, assignments, and exam dates can be found on Canvas and the Mastering platform. Details on how to access Mastering are provided on the Canvas course page. Refer to the official UF Fall 2025 schedule for drop/add dates, withdrawal dates, and holidays: <https://catalog.ufl.edu/UGRD/dates-deadlines/2025-2026/#fall25text>.

- Week 1: Introduction & Basics
- Week 2: Coordinate systems, vector resultants and components
- Week 3: Position vectors, force along a line
- Week 4: Vector products, 2D particle equilibrium
- Week 5: 3D particle equilibrium, moment of a force
- Week 6: Principle of moments, moment about an axis, couple moments
- Week 7: Equivalent force and couple moment systems, distributed forces

Week 8:	2D rigid body equilibrium
Week 9:	Trusses, frames, & machines
Week 10:	Internal forces and moments, shear and bending moment diagrams
Week 11:	Friction
Week 12:	3D static equilibrium
Week 13:	Centroids, fluid pressure
Week 14:	Moment of inertia
Week 15:	Thanksgiving (NO CLASS)
Week 16:	Advanced topics, exam review

### Important Dates

Thursday 9/25/2025	Midterm Exam 1 (8:20 pm – 10:10 pm, FLI Keene-Flint Hall 0050)
Wednesday 11/12/2025	Midterm Exam 2 (8:20 pm – 10:10 pm, FLI Keene-Flint Hall 0050)
Saturday 12/6/2025	Final Exam (7:30 am – 9:30 am, Location TBA)

Note: All sections of statics take this early morning exam on the first day of finals week. The location will be posted on Canvas once confirmed by the Registrar (typically towards the end of the semester).

### Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework*	10 each	15%
Midterm Exam 1	100	20%
Midterm Exam 2	100	25%
Final Exam	100	30%
Engagement**	-	10%
		100%

\*The lowest homework grade will be dropped (see course specific policies below for more details)

\*\*Engagement will include in-class quizzes, participation in office hours, etc. This will be discussed further in class with details posted on Canvas.

### Grading Policy

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

### Academic Policies & Resources

To support consistent and accessible communication of university-wide student resources, instructors must include this link to academic policies and campus resources: <https://go.ufl.edu/syllabuspolicies>. Instructor-specific guidelines for courses must accommodate these policies. Additional course-specific policies are listed below and on Canvas.

You are encouraged to take advantage of the many wonderful resources available at the link above!

### ***Commitment to a Positive Learning Environment***

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values.

If you feel like your performance in class is being impacted, please contact your instructor or any of the following:

- Your academic advisor or Undergraduate Coordinator
- HWC OE Human Resources, 352-392-0904, [student-support-hr@eng.ufl.edu](mailto:student-support-hr@eng.ufl.edu)
- Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, [pld@ufl.edu](mailto:pld@ufl.edu)

### ***COURSE SPECIFIC POLICIES***

#### ***CLASS EXPECTATIONS:***

Regular attendance and participation in class are expected and highly encouraged to support your learning. You are responsible for all information presented during class, including concepts explained verbally or on the board, as well as any course logistics communicated by the instructor.

If you miss class without a UF approved excused absence, it is your responsibility to stay current by reviewing the textbook and any available online materials. You may consult classmates for help if they are willing, but it is not the responsibility of your classmates, the TAs, or the instructor to provide summaries or catch-up sessions for missed classes that do not qualify as excused absences.

#### ***HOMEWORK:***

Homework assignments are designed to help you apply class concepts and reinforce understanding. **All submitted work must be your own.** Collaborative discussion in small groups (3-5 students) and use of generative AI tools (e.g., ChatGPT) to explore general course concepts is allowed, but you must be able to solve problems independently to succeed on exams. **Using generative AI tools to complete homework is not allowed.** Assignments copied from others or completed using unauthorized tools will receive no credit and will be handled according to University academic dishonesty policies.

#### **Submission, Late, and Drop Policy:**

- Homework assignments are typically due weekly (at least one week after being assigned; see Canvas/Mastering for exact deadlines).
- Each student may **drop one homework grade** to account for a particularly difficult week.
- Up to **two homework assignments** may be submitted **within 24 hours of the deadline** for a **50% grade reduction**. These late submissions will be counted at the end of the semester, with grades adjusted accordingly.
- **No additional late homework will be accepted, and no additional drops will be granted under any circumstances.** Plan accordingly and manage your workload to meet these policies. Students with legitimate UF-approved absences or documented emergencies should contact the instructor promptly to discuss accommodations. All other requests for additional late submissions or drops will not be granted.

#### ***EXAMS:***

Exams are an opportunity for students to demonstrate their mastery of course concepts. There will be two cumulative midterm exams during the semester and a cumulative final exam during final exam week. Exams will be held during the scheduled block exam periods as posted on Canvas.

A reference sheet may be used during all exams. The **sheet must be handwritten (no photocopies or printouts), include your full name printed at the top, and be no larger than one side of an 8.5" x 11" piece of paper.** You may include **anything you find helpful**, such as formulas, worked examples, reminders, or encouraging notes to yourself. Some students find it helpful to add material to the same reference sheet throughout the semester, but you may also create a new reference sheet for each exam if you prefer. Reference sheets must be submitted with your exams and will be returned to you when your graded exams are returned.

You may use a calculator during all exams, but ***phones may not be used as calculators***. Storing additional notes in your calculator to get around the reference sheet size limitation is considered academic dishonesty and will be dealt with accordingly.

***RE-GRADE POLICY:***

All graded work is evaluated using detailed rubrics to ensure fair and consistent grading. Students are encouraged to review feedback carefully upon receiving their grades.

If you believe a *grading error* has occurred (e.g., a point was missed or added incorrectly), you may submit a written regrade request **within 1 week** of receiving your graded assignment. Your request should include the original graded work and a clear explanation of the specific grading error you believe was made.

Please note that ***regrade requests are intended to address objective grading mistakes***, not to challenge subjective assessments or rubric criteria. The instructor will review all requests and adjust grades only if a *grading error* is confirmed.

Altering any graded work after it has been returned to request a higher grade is considered a violation of the University honor code and will be dealt with accordingly.