

Course and Instructor Information

**Course Title and Credits:** Applied Mechanics I (Statics) – 3 Credits

**Course Format:** Flipped (online lectures, in-class problem solving)

**Lecture Time and Location:** Wednesday & Friday 1:25PM - 2:15PM (two lectures a week), FSB 103

**Prerequisites:** Math 2110 or 2130 which may be taken concurrently

**Instructor:** Arash E. Zaghi, Ph.D., P.E.

**My Email:** [zaghi@engr.uconn.edu](mailto:zaghi@engr.uconn.edu). Please include **CE2110** in the subject line for all course related emails.

**My Office Location:** Castleman (CAST) Building, Room 328

**My Office Hours/Availability:** Please send me an email to schedule a meeting.

**Teacher Assistants:**

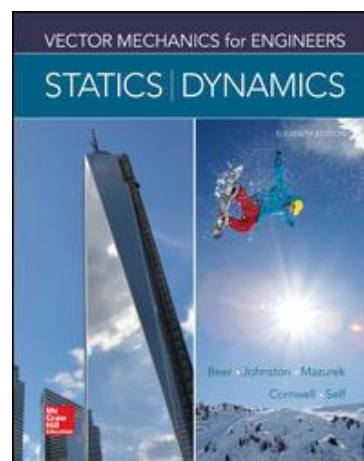
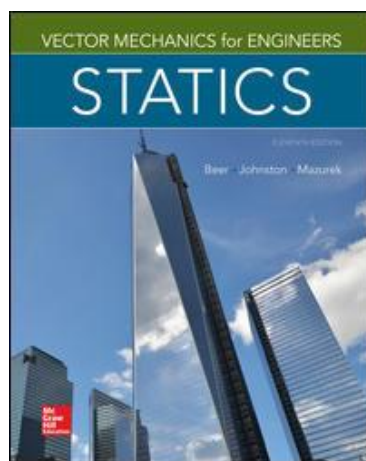
1. Jin Zhu (PhD Student in Structural Engineering Program), Email: [jin.zhu@uconn.edu](mailto:jin.zhu@uconn.edu)  
Office Hours and Location: Monday 1:25PM - 2:15PM (the class time), FSB 103
2. Meghan Mastriano (Undergraduate Assistant), Email: [meghan.mastriano@uconn.edu](mailto:meghan.mastriano@uconn.edu)

**Text Book:**

“*Vector Mechanics for Engineers: STATICS*” by: Ferdinand P. Beer, E. Russell Johnston Jr., & David F. Mazurek, McGraw-Hill, 11<sup>th</sup> Ed., 2015, ISBN: [9780077687304](https://www.mhhe.com/9780077687304)

**OR** if you intend to also take the Dynamics Course, you may consider:

“*Vector Mechanics for Engineers: Statics and Dynamics*” by: F. Beer; E. Russell Johnston, Jr.; D. Mazurek; P. Cornwell; B. Self, McGraw-Hill, 11<sup>th</sup> Ed., 2015, ISBN: [9781259600135](https://www.mhhe.com/9781259600135)



Texts are available through a local or online bookstore. The [UConn Co-op](#) carries many materials that can be shipped via its online [Textbooks To Go](#) service. For more information, see Textbooks and Materials on our [Enrolled Students](#) page.

## Course Organization:

This class is a flipped course. It means the lectures will be delivered online and students will come to class for a very short recitation (if needed), problem solving, and asking their questions. The course runs for a total of 14 weeks (Jan 19, 2016-Apr 29, 2016). Each week you need to watch two or three lectures and sample problem solving videos.

### To be Successful in this Course:

1. Watch lecture videos (approximately 10 min.), lecture notes and background concepts. The videos that you must watch **before** the class are given in the course calendar.
2. Watch a video (approximately 10-20 min.) solving sample problems (if applicable). The videos that you must watch **before** the class are given in the course calendar.
3. Study your text book (the related chapters are specified).
4. Solve weekly HW problems and submit them online.
5. Attend class and participate in practice problem solving. You will be randomly asked to present your solutions.
6. Take online quizzes every other week (a total of six announced quizzes).
7. Take two midterm exams and one final exam (in class).
8. Study the text book. You will find answers to many of your questions and clarifications to confusing concepts in the text book.

### In-Class Activities:

This course is designed based on the latest concepts of active learning. The class sessions involve hands-on problem solving. Instructors and TAs will help you when you are solving problems. The solutions will be presented during class or will be made available later through HuskyCT.

To effectively use the class sessions, please follow the instruction below.

1. You need to have a calculator, pencil, and eraser with you.
2. You are expected to watch the lecture and sample problem solving videos **before attending** the class. The lecture numbers are given in the course calendar.
3. Ask questions during the class and actively participate.
4. Some students learn better when they study in a group. You can work with your classmates during the in-class problem solving.

## Course Objectives

The main objective of this course is to develop the engineering student's ability to analyze problems in a simple and logical manner and to apply basic principles to its solution. Vector analysis will be introduced. It will be used frequently throughout the course. This course introduces the concepts of forces in equilibrium. Upon completion of the course, students should be able to analyze systems of forces in static equilibrium.

The materials you will learn during this course are the most fundamental concepts of engineering. **These concepts will be frequently used in your future courses** (at least 3 to 7 other courses, depending on your program). Make sure that you understand the concepts and learn how to apply them to mechanics problems. If want to be successful in your future classes— and I am sure that you do—take this opportunity to learn the material that will be discussed in this course. This course is a prerequisite for CE 3110: Mechanics of Materials.

By the end of the semester, students should be able to:

1. Draw free-body diagrams for objects that are subjected to external forces
2. Calculate components of forces and solve equilibrium equations in 2D and 3D
3. Calculate moments / force couples
4. Calculate centroids of lines, areas and volumes
5. Analyze simple trusses, frames, and machines by finding the internal and reaction forces
6. Analyze beams and cables
7. Calculate moment of inertia
8. Explain the law of friction and its application

## Course Outline

- See each Module's Objectives and Activities page for complete information.
- The dates are given in the course calendar. *The instructor reserves the right to change dates accordingly as the semester progresses. All changes will be communicated in an appropriate manner.*

Lecture 1: Introduction (Ch1)
Lecture 2: System of Unit- Numerical Accuracy (Ch1)
Lecture 3: Vector Force Resultant (Ch2)
Lecture 4: Equilibrium of Particle (Ch2)
Lecture 5: Free Body Diagram (Ch2)
<b>Quiz 1- Lectures 1-5</b>
Lecture 6: Rectangular Components of Force in Space (Ch2)
Lecture 7: Equilibrium of Forces in Space (Ch2)
Lecture 8: External/Internal Forces-Transmissibility (Ch3)
Lecture 9: Vector Product- Moment (Ch3)
Lecture 10: Cross product- Moment of a force about a point (Ch3)
Lecture 11: Moment of a force about a point- Scalar product (Ch3)
<b>Quiz 2- Lectures 6-11</b>
<b>Midterm Exam 1- Lectures 1-11</b>
Lecture 12: Equivalent Couple- Addition of Couple, Moment about an axis (Ch3)
Lecture 13: Reduction of Force- Equivalent System of Vectors (Ch3)
Lecture 14: Equilibrium in 2D- Support Reaction (Ch4)
Lecture 15: Equilibrium Rigid Body- Statically Determinate (Ch4)
Lecture 16: Equilibrium 3D Reactions/Support (Ch4)
<b>Quiz 3- Lectures 12-16</b>
Lecture 17: Centroid of Gravity/Area/Line (Ch5)
Lecture 18: First Moment of Area (Ch5)
Lecture 19: Distributed Load on Beam (Ch5)
Lecture 20: Submerged Surface (Ch5)
Lecture 21: Centroid of Volume/Gravity (Ch5)
Lecture 22: Truss/Method of Joint (Ch6)
<b>Quiz 4- Lectures 13-22</b>
Lecture 23: Truss- Method of Section (Ch6)
Lecture 24: Analysis of Frames (Ch6)
Lecture 25: Analysis of Machines (Ch6)
<b>Exam 2- Lectures 12-25</b>
Lecture 26: Beam/Various Type of Loading (Ch7)
Lecture 27: Shear Diagram (Ch7)
<b>Quiz 5 - Lectures 23-27</b>
Lecture 28: Bending Moment Diagram (Ch7)
Lecture 29: Relation Between Shear and Bending (Ch7)
Lecture 30: Cable (Ch7)
Lecture 31: Law of Friction (Ch8)
Lecture 32: Wedges (Ch8)
Lecture 33: Square Threaded Screw (Ch8)
<b>Quiz 6 - Lectures 28-33</b>
Lecture 34: Belt Friction (Ch8)
Lecture 35: Moment of Inertia introduction (Ch9)
Lecture 36: Moment of Inertia by Integration(Ch9)
Lecture 37: Moment of Inertia of Composite Section(Ch9)
Lecture 38: Moment of Inertia of a Mass (Ch9)
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<b>Final Exam - Lectures 1-37</b>

**Tentative Breakdown of the Final Grade (may be adjusted, you will be informed of any changes):**

Component	Weight
Homeworks (12 sets)	15%
Quizzes (Six)	15%
Midterm exams (Two)	30%
Final Exam	40%

Students are expected to attend all lectures and class activities. There will be no makeup quizzes or exams. Only works missed by absence resulting from co-curricular activities performed in the interest of the university and/or those that support the scholarly development of the student or a **documented** medical emergency will be accommodated. Students involved in such activities should inform me in writing prior to the anticipated absence and take the initiative to make up missed work in a timely fashion.

**Homework:**

- There are 12 sets of HWs during the semester. Each set includes 4 to 7 problems. You will upload your HW solutions to HuskyCT under “Assignments” and will receive feedback online. You need to upload your assignments before the due date. The due date is on Mondays at 11:59 PM. The due dates are available on calendar. Because the solutions will be posted right after the submission is closed, **No late HWs** will be accepted. Please **DO NOT email** your late HWs.
- To receive full credit on your HWs, you must:
  - Write neatly;
  - Draw free-body diagrams when applicable;
  - Read problem statements carefully and understand the illustrations;
  - Present all calculations, including the equations; and,
  - Circle or box your final answer.
- You need to scan your solutions and save them as a **PDF file** using the scanner located in Homer Babbidge library or your smartphone device. The scanners in the library are free to use, available 8AM-midnight, and are located on the Plaza level by the idesk and on the second level by the commons desk. Check the quality of the scanned copy.
- Homework statements become available under Assignment on HuskyCT.
- Homework Solutions will become available to you after the due dates under Course Resources/Homework Solutions.

**Quizzes:**

- You will take six online quizzes through HuskyCT. **No make-up quizzes** will be offered to students.
- Each quiz contains 10 questions. Questions are multiple choices. You have two attempts. After each attempt, you can see your wrong answers. You will have 20 minutes for each quiz attempt.
- Online quizzes will be available to you four days before their due date. The latest quiz attempt must be completed before 11:59PM on the due date.
- Quiz solutions will become available to you on HuskyCT under Course Resources/Quiz Solutions after the due dates.

**Midterm exam:**

- You will have two mid-term exams.
- Midterm exams contain five to six questions. You have 50 minutes to answer these questions.
- Exams are **NOT** open book/open notes. You can only use your standard hand calculator, pencil and eraser. Please **DO NOT** use a pen.
- There are review sessions in class before midterm exams. You can send your questions to me in advance.
- Solutions to midterm exams will be available on HuskyCT under Course Resources/Exam Solutions.

**Final Exam:**

There will be a 2-hour final exam that covers the entire content of the course. The date will be announced.

**Tentative Grading Scale (Subjected to Change):**

<b>Grade (out of 100)</b>	<b>Letter Grade</b>
93-100	A
90-92.99	A-
87-89.99	B+
83-86.99	B
80-82.99	B-
77-79.99	C+
73-76.99	C
70-72.99	C-
67-69.99	D+
63-66.99	D
<62.99	F

**Cell Phone, Tablet, and Laptop:**

**Cell phones are not permitted to be used in class from start to finish.** Laptops or tablets can ONLY be used to take notes. Please be advised that texting and using laptops for other reasons will distract me and the other students; therefore, if you do not pay attention to my notice, you will be asked to leave the classroom.

As a member of the University of Connecticut student community, you are held to certain standards and academic policies. In addition, there are numerous resources available to help you succeed in your academic work. This section provides a brief overview to important standards, policies and resources.

### Student Code

You are responsible for acting in accordance with the [University of Connecticut's Student Code](#). Review and become familiar with these expectations. In particular, make sure you have read the section that applies to you on Academic Integrity:

- [Academic Integrity in Undergraduate Education and Research](#)
- [Academic Integrity in Graduate Education and Research](#)

Cheating and plagiarism are taken very seriously at the University of Connecticut. As a student, it is your responsibility to avoid plagiarism. If you need more information about the subject of plagiarism, use the following resources:

- [Plagiarism: How to Recognize it and How to Avoid It](#)
- [Instructional Module about Plagiarism](#)
- [University of Connecticut Libraries' Student Instruction](#) (includes research, citing and writing resources)

### Copyright

Copyrighted materials within the course are only for the use of students enrolled in the course for purposes associated with this course and may not be retained or further disseminated.

### Netiquette and Communication

At all times, course communication with fellow students and the instructor are to be professional and courteous. It is expected that you proofread all your written communication, including discussion posts, assignment submissions, and mail messages. If you are new to online learning or need a netiquette refresher, please look at this guide titled, [The Core Rules of Netiquette](#).

### Adding or Dropping a Course

If you should decide to add or drop a course, there are official procedures to follow:

- Matriculated students should add or drop a course through the [Student Administration System](#).
- Non-degree students should refer to [Non-Degree Add/Drop Information](#) located on the registrar's website.

You must officially drop a course to avoid receiving an "F" on your permanent transcript. Simply discontinuing class or informing the instructor you want to drop does not constitute an official drop of the course. For more information, refer to the:

- [Undergraduate Catalog](#)
- [Graduate Catalog](#)

### Academic Calendar

The University's [Academic Calendar](#) contains important semester dates.

## Academic Support Resources

[Technology and Academic Help](#) provides a guide to technical and academic assistance.

## Students with Disabilities

Students needing special accommodations should work with the University's [Center for Students with Disabilities \(CSD\)](#). You may contact CSD by calling (860) 486-2020 or by emailing [csd@uconn.edu](mailto:csd@uconn.edu). If your request for accommodation is approved, CSD will send an accommodation letter directly to your instructor(s) so that special arrangements can be made. (Note: Student requests for accommodation must be filed each semester.)

Blackboard measures and evaluates accessibility using two sets of standards: the WCAG 2.0 standards issued by the World Wide Web Consortium (W3C) and Section 508 of the Rehabilitation Act issued in the United States federal government.” (Retrieved March 24, 2013 from <http://www.blackboard.com/platforms/learn/resources/accessibility.aspx>)

## Software Requirements and Technical Help

- Word processing software
- [Adobe Acrobat Reader](#)
- Internet access

This course is completely facilitated online using the learning management platform, [HuskyCT](#). If you have difficulty accessing HuskyCT, online students have access to the in person/live person support options available during regular business hours in the Digital Learning Center ([www.dlc.uconn.edu](http://www.dlc.uconn.edu)). Students also have 24x7 access to live chat, phone and support documents through [www.ecampus24x7.uconn.edu](http://www.ecampus24x7.uconn.edu).

## Minimum Technical Skills

To be successful in this course, you will need the following technical skills:

- Use electronic mail with attachments.
- Save files in commonly used word processing program formats.
- Copy and paste text, graphics or hyperlinks.
- Work within two or more browser windows simultaneously.
- Open and access PDF files.

University students are expected to demonstrate competency in Computer Technology. Explore the [Computer Technology Competencies](#) page for more information.

## Evaluation of the Course

Students will be provided an opportunity to evaluate instruction in this course using the University's standard procedures, which are administered by the [Office of Institutional Research and Effectiveness \(OIRE\)](#). Additional informal formative surveys may also be administered within the course as an optional evaluation tool.



### ***Policy Against Discrimination, Harassment and Inappropriate Romantic Relationships***

The University is committed to maintaining an environment free of discrimination or discriminatory harassment directed toward any person or group within its community – students, employees, or visitors. Academic and professional excellence can flourish only when each member of our community is assured an atmosphere of mutual respect. All members of the University community are responsible for the maintenance of an academic and work environment in which people are free to learn and work without fear of discrimination or discriminatory harassment. In addition, inappropriate Romantic relationships can undermine the University’s mission when those in positions of authority abuse or appear to abuse their authority. To that end, and in accordance with federal and state law, the University prohibits discrimination and discriminatory harassment, as well as inappropriate Romantic relationships, and such behavior will be met with appropriate disciplinary action, up to and including dismissal from the University.

More information is available at <http://policy.uconn.edu/?p=2884>.

### ***Sexual Assault Reporting Policy***

To protect the campus community, all non-confidential University employees (including faculty) are required to report assaults they witness or are told about to the Office of Diversity & Equity under the Sexual Assault Response Policy. The University takes all reports with the utmost seriousness. Please be aware that while the information you provide will remain private, it will not be confidential and will be shared with University officials who can help.

More information is available at <http://sexualviolence.uconn.edu/>.