

Syllabus – Fall 2014

Course and Instructor Information

Course Title: Applied Mechanics I (Statics)

Credits: #3

Format: (Flipped)

Prerequisites: Math 2110 or 2130 which may be taken concurrently

Professor: Sarira Motaref Ph.D., P.E.

Assistant Professor in Residence

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Telephone: 860-486-2731

Other: Office location: Castleman (CAST) Building, room 332

Office Hours/Availability: Monday- Wednesday-Friday 9:30AM-11:00PM or weekdays by previous appointment

Teacher Assistants:

1. **Alex Samalot, Email:** alexander.samalot@uconn.edu
2. **Hao Yuan Email:** hao.yuan@enr.uconn.edu
3. **Connor Ligeikis Email:** connor.ligeikis@uconn.edu, **Office locations:** CAST 123 **Office Hours:** Thursday 1:00PM-2:30PM Friday 3:00PM- 4:30PM

Course Materials

Required course materials should be obtained before the first day of class.

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.

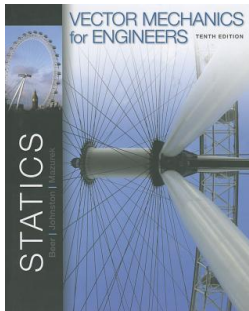
Required Materials:

Text book: Vector Mechanics for Engineers: STATICS or STATICS and DYNAMICS

Ferdinand P. Beer, E. Russell Johnston Jr., & David F. Mazurek

McGraw -Hill, 10th Ed.,2013

ISBN: 9781121724341



Course Organization:

The class is a flipped. It means that the lectures will be delivered online and students will come to the class for recitation (if needed), problem solving and to address their questions on assignments.

Class includes total of 14 week, 38 Lectures, [08/25/2014 to 12/05/2014]

Each lecture usually includes one lecture video and one sample solving video.

For each lecture

1. Watch a video (approximately 10 min.) lecturing concepts and background information.
2. Watch a video (approximately 10-20 min.) solving sample problems (If applicable).
3. Study your text book (page numbers will be provided for each module).
4. Solve weekly problems and submit them online.
5. Attend the class to practice problem solving skill
6. Take online quizzes every other week [total of 7 quizzes].
7. Take 3 midterm exams and 1 final exam [in class].

In Class Activities

Active learning method is utilized in this class. The class sessions involve with problem solving (by students) individually and in teamwork. Instructors and TAs will guide you during problem solving. The solution to the problems will be presented either in class or later the file will be uploaded to HuskyCT.

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

1. Having calculator/pencil/eraser in class session is mandatory.
2. You are supposed to watch the lecture video and sample solving video before attending the class. You can find lecture number from Calendar.
3. Send your questions on the watched videos to instructor at least 2 hours before your class session. Instructor will have a recitation on that topic if it is necessary.
4. Work closely with your classmates to get help from peers too.
5. Some problem needs to be studied in a group. Students' seat may be rotated for learning purposes.

Course Description

Fundamentals of statics using vector methods. Resolution and composition of forces; equilibrium of force systems; analysis of forces acting on structures and machines; centroids; moment of inertia.

The main objective of this course is to develop in the engineering students the ability to analyze any problem in a simple and logical manner and to apply to its solution a few, well understood, basic principles. Vector analysis is first introduced and will be used later in the presentation and discussion of the fundamental principle of mechanics. This course introduces the concepts of engineering based on forces in equilibrium. Topics include concentrated forces, distributed forces, forces due to friction, and inertia as they apply to machines, structures, and systems. Upon completion, students should be able to solve problems which require the ability to analyze systems of forces in static equilibrium.

This course will be prerequisite for Mechanics of Materials CE 3110 and later in other advanced courses, such as CE 3630 and CE 3640.

Course Objectives

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

1. Draw free body diagrams of objects with applied external forces
2. Calculate components of forces and solve equation of equilibrium in 2D and 3D
3. Calculate moments / force couples
4. Calculate centroids of lines, areas and volumes
5. Analyze trusses, frames, and machines by finding the internal forces and reactions
6. Analyze beams and cables
7. Calculate moment of inertia
8. Explain the laws of friction and its application

Course Outline (and Calendar if Applicable)

Course Modules
See each Module's Objectives and Activities page for complete information and the calendar for all due dates.
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)
Quiz 1-Refer to you course Calendar for date (Lectures 1-5)
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: Rectangular Components of Moment-Scalar Product(Ch3)
Lecture 11: Moment of a Given axis- Moment of Couple(Ch3)
Quiz 2-Refer to you course Calendar for date (Lectures 6-11)
Midterm Exam 1-Refer to you course Calendar for date (Lectures 1-11)
Lecture 12: Equivalent Couple-Addition of Couple(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)
Quiz 3-Refer to you course Calendar for date (Lectures 12-16)
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)
Quiz 4-Refer to you course Calendar for date Midterm (Lectures 13-22)
Exam 2-Refer to you course Calendar for date (Lectures 12-22)
Lecture 23: Truss- Method of Section (Ch6)
Lecture 24: Analysis of Frames (Ch6)
Lecture 25: Analysis of Machines (Ch6)
Lecture 26: Beam/Various Type of Loading (Ch7)
Lecture 27: Shear Diagram (Ch7)

Quiz 5-Refer to you course Calendar for date (Lectures 23-27)
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)
Quiz 6-Refer to you course Calendar for date (Lectures 28-33)
Exam 3-Refer to you course Calendar for date (Lectures 23-33)
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)
Quiz 7-Refer to you course Calendar for date (Lectures 34-37)
Final Exam-Refer to you course Calendar for date (Lectures 1-37)

Course Requirements and Grading

Summary of Course Grading:

Course Components	Weight
Home works (12 sets)	15%
Quizzes (7 sets)	10%
Midterm exams (3 sets)	45%
Final exam	30%

Home works

- There are 12 sets of Home works during the semester. Each set includes 4 to 7 homework problems. You will upload HWs to HuskyCT under “Assignments” and will get feedback online. You need to upload your assignments before the due date to HuskyCT. The due date is usually on Monday or Wednesday (until 11:59PM). The due dates are available on calendar. The calendar file is located in HuskyCT under Syllabus & Calendar. **No late HWs** will be accepted.
- To receive full credit on your homework, you must:
 - Write neatly;
 - Draw your free body diagram;
 - Note any given values and the value you seek to calculate;
 - Write your solution including all equations and calculations; and,
 - Circle or box your final answer.
- You need to scan your home works and save as a **Pdf file** using the scanner located in Homer library or your smartphone device. The scanners in library are free to use, available 8AM-midnight, and are located in Plaza level by the idesk and second level by the commons desk.
- Homework statements are available both in each assignment and also under Course Resources/Homework Statements in HuskyCT.

- Homework Solutions will be available to you after due date under Course Resources/Homework Solutions.

Quiz

- **Online** quizzes (total of 7 quizzes):
 - Quiz 1 is due Tuesday, 09/09/2014, (Materials from Week1 and Week 2)
 - Quiz 2 is due Tuesday, 09/23/2014, (Materials from Week3 and Week 4)
 - Quiz 3 is due Tuesday, 10/07/2014, (Materials from Week5 and Week 6)
 - Quiz 4 is due Tuesday, 10/21/2014, (Materials from Week7 and Week 8)
 - Quiz 5 is due Tuesday, 11/04/2014, (Materials from Week9 and Week 10)
 - Quiz 6 is due Tuesday, 11/18/2014, (Materials from Week11 and Week 12)
 - Quiz 7 is due Friday, 12/05/2014, (Materials from Week13 and Week 14)
- Each quiz contains 10 questions. Questions are multiple choices. You have 30 minutes for each quiz attempt.
- Online quizzes will be available to you 4 days before due date. The latest quiz attempt should start before 11:59PM of the due dates. You can have 2 attempts. After each attempt, you can see your wrong answers. **No make-up quiz** will be offered to students.
- Quiz solution will be available to you in HuskyCT under Course Resources/Quiz Solutions after due dates.

Midterm exam

- **In-Class** Midterm exams (3 Midterm exams):

Midterm exam 1: Monday, September 29th, 2014(50 minutes) [Week 1 to Week 4]

Midterm exam 2: Monday, October 27th, 2014(50 minutes) [Week 5 to Week 8]

Midterm exam 3: Friday, November 21st, 2014(50 minutes) [Week 9 to Week 12]

- Midterm exams contain 5-6 questions. You have 50 minutes to answer questions.
- Exams are NOT open book/open notes. You can only have your calculator, pencil and eraser. Please DO NOT use Pen to answer questions. There is no restriction on the calculator model for the exam
- There are review sessions in the class before midterm exams. You can send your questions to instructor in advance to be addressed in the review sessions.
- Solution to midterm exams will be available in HuskyCT under Course Resources/Exam Solutions.
- Make up exams will be offered to students only in following cases.
 - a) Medical emergency with an official letter from hospital or doctors
 - b) Students with disability can contact CSD to schedule exam in a private room with extended time.
 - c) Athletic team members also can reschedule exam with a letter from their coach (in case of conflict between exams and their tournaments).

Final Exam

Final Exam in class: Comprehensive exam, Date and Time to be announced (2 hours) [Week 1 to Week 14]

Grading Scale: (Subjected to change)

Undergrad

Grade	Letter Grade	GPA
93-100	A	4.0
90-92	A-	3.7
87-89	B+	3.3
83-86	B	3.0
80-82	B-	2.7
77-79	C+	2.3
73-76	C	2.0
70-72	C-	1.7
67-69	D+	1.3
63-66	D	1.0
60-62	D-	0.7
<60	F	0.0

Due Dates and Late Policy

All course due dates are identified in the calendar available in HuskyCT under Syllabus& Calendars. Deadlines are based on Eastern Standard Time; if you are in a different time zone, please adjust your submittal times accordingly. *The instructor reserves the right to change dates accordingly as the semester progresses. All changes will be communicated in an appropriate manner.*

No late assignments will be accepted. No makeup quiz will be offered.

Feedback and Grades

You will receive online feedbacks on your assignments and quizzes. Midterm exams and final exams results will be available to you in a week after the exam date. In addition solutions to all home works, quizzes, midterm exams, and final exams will be available in huskyCT under Course Resources.

Student Responsibilities and Resources

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. 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

(add additional items as needed and link to <http://ecampus.uconn.edu/plugin-ins.html>)

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). Students also have 24x7 access to live chat, phone and support documents through 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.

(add additional items as needed and link to <http://ecampus.uconn.edu/plugin-ins.html>)

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.