AEM2011: Statics

<u>Instructor:</u> Peter Seiler
Office: 224 Akerman Hall
Phone: 612-626-5289, Email: `seile017@umn.edu`
Office Hours: M 10:00-11:00am, W 12:30pm-1:30pm, or by appointment

<u>Course Information:</u>
Lectures: MWF 9:05 - 9:55am in 101 Tate Hall (3 Credits)
Discussions: Tu 8:00-8:50 (211 AkerH), 1:25-2:15 (215 AkerH), 9:05-9:55 (217 Lind)
Webpage: `https://www.aem.umn.edu/courses/aem2011/spring2019/`
University Policy Statements: `http://www.aem.umn.edu/teaching/syllabi.shtml`
Prerequisites: PHYS 1301W, concurrent MATH 2374 or equivalent

<u>Teaching Assistants and Graders:</u>

	Email	Office	Office Hours
TBD	TBD@umn.edu	TBD	TBD
AEM General OH		130A Akerman	TBD

<u>Textbook:</u>
E.P. Beer, E.R. Johnston, and D.F. Mazurek, Vector Mechanics for Engineers: Statics, 12th Edition, McGraw-Hill, 2012. The book "Vector Mechanics for Engineers: Statics & Dynamics", by the same authors may be used instead. The "Statics" part in the two books is identical.

<u>Course Objectives:</u>
Develop an understanding of the principles of statics and the ability to construct free body diagrams. Understand how to solve equilibrium problems involving trusses frames and machines. Be able to analyze distributed loads. Understand the concept of internal forces in members, and be able to draw shear and bending-moment diagrams for beams. Obtain knowledge of the laws of dry friction. Understand properties of areas and be able to calculate centroids and moments of inertia for areas.

<u>Course Outcomes:</u>
Students who successfully complete the course will demonstrate the following outcomes by tests and homework:
1. An ability to construct free-body diagrams and to calculate the reactions necessary to ensure static equilibrium.
2. An understanding of the analysis of distributed loads.
3. A knowledge of internal forces and moments in members.
4. An ability to calculate centroids and moments of inertia.
5. An ability to solve static equilibrium problems involving friction.

<u>Homeworks and Quizzes:</u>
Recommended homework problems will be posted weekly on the course website. You should solve as many of these problems as possible to improve your understanding of the material. You are encouraged to contact the instructor and/or the TAs with any questions. You are also free to work together with your classmates on the homework, however you should be able to solve the problems on your own. Solutions will be posted but the homeworks will not be collected. Instead, a short quiz will be given at the beginning of each recitation section. The quiz problem will be based (with minor changes) on one of the homework problems from the previous week. There will be 11 quizzes throughout the semester. Each quiz will be worth 2% of your total grade and your quiz score will only be counted if it is greater than your final exam score. The contribution of the quizzes to your final grade will be

$$0.02 \times \sum_{i=1}^{11} \max\{\text{Score of Quiz } i, \text{Final Exam Score}\}$$

The above grading policy means that it will not adversely affect your final grade if you miss a quiz for any other reason (e.g. illness) or simply do poorly on it. Quizzes that are missed for any reason cannot be made up. It is not necessary to inform the teaching staff if you plan to miss a quiz.

Exams:
There will be two 50 minute in-class exams and one final exam. All exams will be closed note and closed book except for one 8.5×11 sheet (front and back) of notes. You will not be allowed to have any books or class notes in the classroom on exam day. Exams cannot be made up without a valid, documented excuse (e.g. letter from doctor).

Electronic Devices:
During quizzes/exams you may only use a simple calculator that does not communicate in any wireless manner. Pagers, cell phones, and all other communications devices must be turned off during quizzes/exams.

Scholastic Dishonesty:
Cheating is completely unacceptable. University policies on scholastic conduct (see link) will be strictly enforced. https://regents.umn.edu/sites/regents.umn.edu/files/policies/Student_Conduct_Code.pdf

Regrades:
Your quizzes and exams will be graded and handed back as soon as possible. If you have any questions or comments on the grading please contact the TA who graded your paper. If you feel your work was incorrectly graded then submit your request for a regrade in writing to the TA. **You have one week to deal with grade disputes. The grade will be final if no request is made within one week.** When disputing a grade, be aware that your work will be reexamined and as a result your grade can be reduced as well as increased.

Grading:
Letter grades for the course will be assigned using the following scale:

A,A-	90.0 - 100
B+,B,B-	80.0 - 89.9
C+,C,C-	70.0 - 79.9
D+,D,	60.0 - 69.9
F	below 60.0

This is only a rough scale. This scale may be adjusted depending on the performance of the class. Any adjustments to the scale will only lower the cut-offs to achieve a specified grade; cut-offs will not be raised beyond those listed here. Grades will be weighted as follows: Quizzes 22%, Exam 1 22%, Exam 2 22%, and Final Exam: 34%. **Students can check their posted grades at:** http://www.aem.umn.edu/srs. No extra credit opportunities to improve grades will be available either during or at the end of the semester.

Course Outline:
Below is an outline of the tentative course schedule. This outline may be modified slightly as the term progresses.

Week	Dates	Textbook Sections	Quizzes/Exams
1	Jan. 23, 25	1.1-6, 2.1-2	
2	Jan. 28, 30, Feb. 1	2.3, 2.4, 2.5	Quiz 1 (2.1-2.2)
3	Feb. 4, 6, 8	3.1, 3.1 (cont.), 3.2	Quiz 2 (2.3-2.5)
4	Feb. 11, 13, 15	3.3, 3.4, 3.4 (cont.)	Quiz 3 (3.1-3.2)
5	Feb. 18, 20, 22	4.1, 4.1 (cont.), 4.2	Quiz 4 (3.3-3.4)
6	Feb. 25, 27, Mar. 1	Examples, 4.3, 5.1	Quiz 5 (4.1-4.2)
7	Mar. 4, 6, 8	5.1 (cont.), 5.2	**Exam 1** on 3/8
8	Mar. 11, 13, 15	5.2 (cont.), 5.3, 5.4	Quiz 6 (4.3, 5.1)
	Mar. 17-23	Spring Break	
9	Mar. 25, 27, 29	6.1.(A/B), 6.1.C, 6.2	Quiz 7 (5.2-5.4)
10	Apr. 1, 3, 5	6.3, 6.4, 7.1	Quiz 8 (6.1-6.2)
11	Apr. 8, 10, 12	7.2, Examples, 7.3	Quiz 9 (6.3-6.4, 7.1)
12	Apr. 15, 17, 19	Examples, 8.1	**Exam 2** on 4/19
13	Apr. 22, 24, 26	8.1 (Cont.), 8.2.A, 8.2.A (Cont.)	Quiz 10 (7.2-7.3, 8.1)
14	Apr. 29, May 1, 3	Examples, 8.4, 9.1.(A/B)	Quiz 11 (8.1-8.2)
15	May 6	9.2	
			Final Exam: Mon. 5/13 1:30-3:30 p.m.