

Engr 2401: Engineering Mechanics – Statics

Lecture on TTh 11:10 am – 1:00 pm
Science Building, Room 214

Syllabus – Fall 2010

Instructor: Dr. April K. Andreas
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Department Website: <http://www.mcclennan.edu/departments/engr/>
Course Website: <http://www.cleverfred.com/mcc/>

Course Description: Basic theory of engineering mechanics, using calculus, involving the description of forces, moments, and couples acting on stationary engineering structures; equilibrium in two and three dimensions; free-body diagrams; friction; centroids; centers of gravity; and moments of inertia. Semester hours 4 (4 lec)

Prerequisites: Students must have completed PHYS 2425 – Principles of Physics I. Also concurrent enrollment in or previous completion of MATH 2414 – Calculus II

Learning Outcomes: Upon successful completion of this course, the student will be able to demonstrate the following learning outcomes:

1. State the fundamental principles used in the study of mechanics.
2. Define magnitude and directions of forces and moments and identify associated scalar and vector products.
3. Draw free body diagrams for two- and three-dimensional force systems.
4. Solve problems using the equations of static equilibrium.
5. Compute the moment of force about a specified point or line.
6. Replace a system of forces by an equivalent simplified system.
7. Analyze the forces and couples acting on a variety of objects.
8. Determine unknown forces and couples acting on objects in equilibrium.
9. Analyze simple trusses using the method of joints or the method of sections.
10. Determine the location of the centroid and the center of mass for a system of discrete particles and for objects of arbitrary shape.
11. Analyze structures with a distributed load.
12. Calculate moments of inertia for lines, areas, and volumes.
13. Apply the parallel axis theorem to compute moments of inertia for composite regions.
14. Solve problems involving equilibrium of rigid bodies subjected to a system of forces and moments that include friction.
15. Solve problems involving dry sliding friction, including problems with wedges and belts.

Required Text & Material:

- Engineering Mechanics: Statics & Dynamics, 12e by Hibbeler w/ MasteringEngineering Access Code
ISBN: 0132135167
- Schaum's Outline of Mathematical Handbook of Formulas and Tables, 3ed
McGraw-Hill
ISBN: 978-0071548557 or 0071548556
- A scientific calculator. TI-89s are my favorite, but any calculator that can do exponents, logarithms, and trigonometric functions should be fine.

Additional requirements: Student must have a reliable computer and internet connection. Students must be able to demonstrate basic computer literacy skills such as keyboarding, sending and receiving email, and using a web browser.

Office Hours: Unless announced otherwise, my office hours will be MW 12:00 pm – 1 pm and TTH 9:00 am – 10:30 am. You can also make an appointment to meet with me at another particular time, and are also welcome to drop by my office without an appointment.

Learning Lab: The Learning Lab in the Science Building, room 135, has many reference books available, and you may find some success studying there. There are also five computers you can use to work on your homework. We do ask that if another engineering student needs to use a computer to work on SolidWorks that you relinquish your computer in a reasonable amount of time. SolidWorks is only available on a small number of campus computers, whereas your online homework can be done from any campus computer.

Attendance: Attendance is mandatory. Per MCC policy, you will be automatically dropped after missing 25% of class meetings, **or 8 lectures**. For this purpose, arriving late and leaving early both count as half an absence. If you are dropped before the official drop date, you will receive a grade of W. If you are dropped after the official drop date, you will receive a grade of F, unless there are highly unusual circumstances.

MCC allows for “excused” absences caused by (1) authorized participation in official College functions, (2) personal illness, (3) an illness or a death in the immediate family, or (4) the observance of a religious holy day. It is your responsibility to let me know the reason for an absence the day you return to campus and provide sufficient documentation (doctor’s note, email from coach, etc.).

ADA Statement: “In accordance with the requirements of the Americans with Disabilities Act (ADA), and the regulations published by the United States Department of Justice 28 C.F.R. 35.107(a), MCC’s designated ADA co-coordinators, Mr. Gene Gooch - Vice President, Finance and Administration and Dr. Santos Martinez – Vice President, Student Services shall be responsible for coordinating the College’s efforts to comply with and carry out its responsibilities under ADA. Students with disabilities requiring physical, classroom, or testing accommodations should contact Mr. Marcus Sweatt, Disabilities Specialist, at 299-8122 or msweatt@mclennan.edu.”

Six Drop Rule: Students who enroll at MCC as entering freshman or first-time college students during the fall 2007 semester or any subsequent semester may not drop more than six courses. The six-course limit does not apply to students who were enrolled in college courses prior to the fall 2007 semester. Students who have completed a baccalaureate degree at any accredited public or private institution are not subject to the six-course limit. The six –course limit includes courses taken at MCC or any other Texas public institution of higher education. If a seventh drop is attempted, the student and instructor will be informed that the student must remain in the course and the student will receive a grade of A, B, C, D, F or 1. He/she will not be able to receive a W or withdrawal grade and will not be due a refund of tuition and fees. All courses dropped after the semester census date are included in the six-course limit unless (1) the student withdraws from all courses or (2) the drop is an approved drop exemption.

Academic Integrity: Any student that is found guilty of academic dishonesty such as cheating, plagiarism, or collusion, will receive the zero grade on every test or assignment involved. For repeated violations, a guilty student can be assigned a failing grade in this course and can be recommended for suspension from the McLennan Community College District.

Privacy: Because of Privacy Laws, I can only discuss your grade with you, in person and in private. I can only discuss grades by e-mail if you e-mail me with your university address.

Miscellaneous:

- Your success in this class depends on you keeping up with assignments. Once you fall behind, you're going to be in significant academic pain.
- In case the school has to close due to inclement weather, please visit the school website for up to date official information at <http://www.mclennan.edu/>.
- Normally, please do not bring your children, friends, or guests to the class. (Please discuss this with me because I do not want you missing class if you cannot make child care arrangements.)

Makeup Policy and Late Assignments. Late assignments will not be accepted. Since most all assignments and due dates are posted a week in advance, even if you get sick the day before it is due, you still must have it in on time. If you are legitimately ill for a week or more at a time (with documentation from a doctor's office), I will do what I can do work with you. If you have to miss class on the day that an assignment is due for either a college event or religious holiday, you must turn in the assignment early.

If you are legitimately ill during an in-class exam, you must email me the morning of the exam (before you miss it), and provide a doctor's note the first day you are back in class in order to receive consideration for a makeup exam.

Grading Policy

Grade Distribution	
Homework	40%
Tests	35%
Final	25%
Total	100%

A 90-100%

B 80-89%

C 70-79%

D 60-69%

F 0-59%

Homework: Homework must be in by 11:00 am on the day it is due *whether or not you are in class that day*. Specific problems will be posted on MasteringEngineering, along with additional requirements. Unless we have a test, homework will be due every class day.

While you should attempt to complete all assignments through MasteringEngineering, in the event that MasteringEngineering is not working, you may complete the corresponding problems from your book on paper and turn them in at the beginning of class. These problems will be posted on the course website listed at the top of the syllabus and on Blackboard. If you do not show your work, you will not receive credit. Do not turn in assignments on paper unless there is a significant technical problem with MasteringEngineering. **You may not turn in more than 3 paper assignments during the year.**

Tests: Three tests will be given during the semester. While taking the tests, cell phones must be put away and turned off. You must complete each test during the time given. If you are late for class, you forfeit that amount of time to work. Makeup exams will only be given in rare cases, following the policy outlined earlier in the syllabus.

You may not use your textbook, but you may use your Schaum's guide, as long as there are no stray marks or notes in it. **You will need a scientific calculator (not on your phone) to complete the tests.** You can substitute your final exam grade for your lowest test score, if that grade is higher than any of your test grades.

- Example 1: If your test grades are 95, 80, and 68, and your final exam grade is 83, your test average will be $(95 + 80 + 83)/3 = 86$.
- Example 2: If your test grades are 95, 80, and 68, and your final exam grade is 32, your test average will be $(95 + 80 + 68)/3 = 81$.
- Example 3: If you miss a test, your test average will average the two tests you did take and your final exam grade.

You can get up to 5 bonus points on a test by completing the associated practice problems specified in MasteringEngineering. You can try the practice problems as many times as you want. I will only consider a problem complete if you have earned a score of 100% on it. Practice problems must be completed by 11 am on the associated test day.

You will earn 0.5 bonus points per practice problem successfully completed. Any problems completed beyond the first 10 are “for your enrichment.” *These practice problems should be completed as we progress through the course, which is why they are organized according to lecture. They will take hours, and if you try to do them the night before a test, you will be at a great disadvantage.*

Applicable Practice Problems	Total Problems Available	Due Date
Lecture 1 – 5 Practice	18	Sep 16
Lecture 6 – 12 Practice	14	Oct 19
Lecture 13 – 20 Practice	11	Nov 16

Comprehensive Final Exam: The comprehensive final will be **Thursday, December 9, from 11:10 am – 1:10 pm**. It will be taken in class. The final exam grade cannot be dropped or retaken. You may not use your textbook, but you may use your Schaum’s guide, as long as there are no stray marks or notes in it. You will also need a scientific calculator that’s not on your phone. No bonus points may be earned for the final exam.

Tentative Lecture Schedule

Below is an initial sketch of when we will cover material and when tests will be scheduled. It is your responsibility to attend class so you will know of any changes to this schedule, including any changes in test dates.

Date	Material Covered
Tue, Aug 24	Sections 1.1 – 1.6 Sections 2.1 – 2.3
Thu, Aug 26	Sections 2.4 – 2.6
Tue, Aug 31	Sections 2.7– 2.9
Thu, Sep 2	Sections 3.1 – 3.3
Tue, Sep 7	Sections 3.4, 4.1
Thu, Sep 9	Sections 4.2 – 4.4
Tue, Sep 14	Sections 4.5 – 4.6
Thu, Sep 16	Test on Chapter 1 – 3
Tue, Sep 21	Sections 4.7 – 4.8
Thu, Sep 23	Section 4.9
Tue, Sep 28	Sections 5.1 – 5.2
Thu, Sep 30	Sections 5.3 – 5.4
Tue, Oct 5	Sections 5.5 – 5.7
Thu, Oct 7	Sections 6.1 – 6.3

Date	Material Covered
Tue, Oct 12	Section 6.4
Thu, Oct 14	Section 6.6
Tue, Oct 19	Test on Chapters 4 – 5
Thu, Oct 21	Section 7.1
Tue, Oct 26	Sections 7.2 – 7.3
Thu, Oct 28	Section 7.4
Tue, Nov 2	Sections 8.1 – 8.2
Thu, Nov 4	Sections 8.3 – 8.5
Tue, Nov 9	Section 9.1
Thu, Nov 11	Section 9.2
Tue, Nov 16	Test on Chapters 6 – 8
Thu, Nov 18	Sections 10.1 – 10.3
Tue, Nov 23	Sections 10.4, 10.8
Tue, Nov 30	Instructor's Choice
Thu, Dec 2	Review Day

I reserve the right to change any term on this syllabus at any time during the semester.