Statics
Fall 2011
Engineering 8
Sections #56506 and #56278

Instructor: Dr. John Heathcote
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Class Times: TTh 9:00-10:15 am or ONLINE
Room: PHY-70

Office Hours: Mondays, 9:00-10:50 am and 12:00-12:50pm
Wednesdays, 10:00-10;50 am and 12:00-12:50 pm
Fridays, 10:00-10:50 am
Or feel free to stop by or make an appointment

Prerequisite: PHYS 4A
Corequisite: MATH 6

Catalog Description: The study of rigid bodies in static equilibrium when acted upon by forces and couples in two- and three- dimensional space. Included are equilibrium of rigid bodies, trusses, frames and machines, as well as the calculation of centers of mass, centroids, friction, and moments of inertia. Additional topics, which may be covered, include distributed forces in cables, beams, and fluid statics, mass moments of inertia, and virtual work.

Important Note about this Course:
This course is being taught with both a traditional "face-to-face" section of students and an online section of students. The assignments and tests will be the same for both groups of students. Students in the "face-to-face" section will be taught in class each week, while students in the online section will receive that material online. (The online material will include videos of lectures and worked out problems and written notes.) Students in the "face-to-face" class can also access this online material to either catch up on missed work or to supplement in-class learning. Likewise, online students are welcome to come to a "face-to-face" class whenever they desire as well.

Required Textbook: *Homework problems will be assigned from this textbook. If you try to use an older edition, the content will be generally the same. However, the problems may be different. You would need to access the homework problems from this edition.*

Vector Mechanics for Engineers: Statics
Beer, Johnston, Mazurek, and Eisenberg
9th Edition
ISBN: 978-0-07-352923-3

Grading:	70%	Four Tests
	15%	Design Project(s)
	15%	Homework

Tests and Final Exam: There will be four tests during the term. Each test may cover material from the entire semester. Rules for what is allowed for each test will be announced before each test. "Face-to-face" students will take these tests during regularly scheduled classes. Online students will come on campus at prearranged times to take these tests.

Design Project: In order to apply some of the concepts from this course, one or more design projects will be assigned. In these projects, you will use what you have learned in the course to design or analyze some sort of engineering structure. The actual construction of this structure may not be assigned. An important part of this project will be the design report that accompanies it.

Homework: Homework will be assigned in order to practice the problem-solving skills taught in class. Homework for this course will be traditional written homework from the textbook. Each week, a list of homework problems will be posted. Specific problems will be submitted for grading. Other problems will not be submitted, but students will be strongly encouraged to complete them.

Late Work and Make-up Tests: Homework should be submitted on time in order to receive full credit. If there is a valid reason that the work must be turned in late, please inform the instructor ahead of time. Make-up tests will only be arranged upon prior approval. If you will miss a test, you MUST let the instructor know beforehand.

Cheating and/or plagiarism: Cheating and/or plagiarism will not be tolerated. A student will receive no credit for the assignment if in the opinion of the instructor the individual has cheated.

Grading Scale:

90-100%	A
80-89.9%	B
70-79.9%	C
60-69.9%	D
<60%	F

Attendance: In order to successfully complete this course, you must learn the material that is presented during lecture. You should either **attend class or access the material that is posted online**.

Accommodations for Students with Disabilities:
If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.

Add Date:	Friday, September 2nd	Last day to add a course
Drop Date:	Friday, October 14th	Last day to drop this course
Holidays:	Thursday, November 24th	Thanksgiving Day
Final Exam:	Tuesday, December 13th (for face-to-face section)	9:00-10:50 pm

Exam Schedule

On exam days, students can take tests at either of these times / locations:

PHY-70 during the 9AM class period.
The Math Center – FEM-1 – at 6pm.

Exam #1:	Thursday, September 8th
Exam #2:	Thursday, October 6th
Exam #3:	Thursday, November 3rd
Exam #4:	Thursday, December 15th (evening date)

Course Outline:

Unit	Chapters	Topics	Weeks
A	1, 2	Introduction, Vectors, Force Systems	1-4
B	3, 4	Moments, equilibrium in two dimensions	5-8
C	6, 8	Equilbrium in 3-D, Structures	9-12
D	5, 7, 8, 9	Centroids beams, friction, moments of inertia	13-18

COURSE OBJECTIVES:

In the process of completing this course, students will:

A. Understand the vector operations of addition, subtraction, dot product, and cross product and use them in applications.
B. Draw the free body diagram of an object subjected to external forces and couples.
C. Apply the principles of mechanical equilibrium to solve problems involving a force system acting on a point mass.
D. Define and use the concepts of moment, couple, and resultant as they apply to static equilibrium problems.
E. Apply the principles of mechanical equilibrium to solve problems involving forces and couples acting on a theoretical rigid body.
F. Learn the analytical techniques appropriate for objects subjected to distributed forces.
G. Solve truss, frame, and machine application problems, using the principles of mechanical equilibrium.
H. Define and use the concepts of shear force, normal force, and bending moment in the solution of internal force problems.
I. Generate shear and bending moment equations and draw shear and bending moment diagrams for a loaded beam.
J. Solve different classes of dry friction problems.
K. Apply the theory of dry friction to application problems.
L. Define and calculate centroid, center of mass, and center of gravity for various 1-D, 2-D, 3-D, and composite bodies.
M. Define and calculate moment of inertia and mass moment of inertia for various 1-D, 2-D, 3-D, and composite bodies.
N. Use the concept of virtual work to solve simple problems in systems with variable equilibrium states.