

EM 222

WKU Engineering Statics

Summer 2019 (CRN#39305)

Gordon Smith, Ph.D.

gordon.smith@wku.edu

doc@wku.edu

office: EBS1119

270-745-2464

Course Description

A study of forces on bodies at rest. Vector algebra, study of force systems, equivalent force systems, distributed forces, internal forces, principles of equilibrium, application to trusses, frames, and beams and friction.

Prerequisites: MATH136 (Calculus I)

Corequisites: MATH137 (Calculus II)

PHY255 (University Physics I)

Required Materials

- **Vector Mechanics for Engineers - Statics, 11th Edition**, 2015, by Beer, Johnston and Mazurek. This text is part of a two-volume series (Statics and Dynamics), and is included as an electronic textbook with your MHConnect access (see below). A lot of people like a physical copy as well (I'm one of them), and there are several ways you can get the information in a physical version of the text:

1. As the current physical edition of the combined textbook, Statics and Dynamics (ISBN 978-0073398242)
2. As the separate, first half of the series, Statics (ISBN 978-0077687304)
3. As an earlier physical edition of the combined or separate text (so 9th or 10th edition is ok, but you'll need to keep an eye on the changeups).

- **MHConnect Access.** This is an online homework system where all nontest assignments will be found. You do need to be careful in how you get this, however. There are two ways.

1. Purchase the Access Card from the Bookstore. They have the correct magic numbers, and I have asked them to provide it separately and bundled with the current edition of the textbook.
2. Purchase the access directly from MHConnect. When the course starts and you register for homework access, there will be an opportunity to purchase access at that time.

From time to time, students have tried to find another way to buy the access card (through Amazon or other used sources), but this almost never works because MHConnect is particular about which version goes with which course. Trust me, it's not worth the risk.

- **Scientific Calculator.** While you can use any calculator to complete homework and quizzes, the tests and the final will follow NCEES Standard (what you will be allowed to use for professional exams). As of 2015, this is limited to:

Casio : All FX-115 models

HP: HP33s and HP35s models

TI: All TI 30X and TI36X models

If you don't have the right calculator for the tests or the final, you won't be allowed to use your "regular" calculator, or pass a classmate's calculator back and forth, or a calculator on your cell phone. I might have one, but quantities are sure to be limited.

Course Resources

Blackboard. Blackboard is a Learning Management System which will be used for assignments and gradebook in this course. You can login to Blackboard at <http://blackboard.wku.edu> with your username (NetID) and password.

MH Connect will be used extensively for homework and quizzes. Students will be expected to check KCTCS email regularly. If a student has any difficulty using Blackboard or the textbook website, they have one week from the first day of class to make those issues known to the instructor.

Course Outcomes

1. Perform vector operations
2. Identify and draw appropriate free body diagrams
3. Determine moment of a force about a point or line and moment of a couple
4. Write appropriate equilibrium equations and solve for unknowns
5. Determine resultants of force-couple systems and distributed loadings
6. Analyze (as a whole or in separate pieces) truss and frame structures
7. Identify and calculate internal forces in structural members
8. Draw shear force and bending moment diagrams
9. Solve problems involving dry friction
10. Determine first moments of area and volume
11. Locate center of gravity and centroid of a body
12. Determine second moment of area and moment of inertia for an area

Course Grade

Your grade in this course stems from a variety of sources

25%	Homework	Homework is assigned through MH Connect, an online resource. Problems will be available on a weekly basis, subject to the following breakdown: <ul style="list-style-type: none">• <u>NUMERICAL ACCURACY</u>, automatically graded by MH Connect. You can repeat the assignment over and over until you achieve a perfect score. Problems are randomized per student, both in scenario and numeric value.
40%	Exams	Exams will be held during the normal class period, graded on form and result. In addition to writing implements, a ruler, and scratch paper, you will only be allowed a NCEES-approved calculator for the exam.
<u>35%</u>	Final Exam	The final exam will be held during finals week, and is cumulative.
100% Total		

Grades are based on a 10-point scale (A: 90-100, B: 80-89.999, etc)

Professional Conduct

It is expected that all students be present in each lesson, will be courteous of others' ideas, and otherwise will conduct themselves in a professional manner in accordance with the WKU Student Handbook. Conduct determined to be unacceptable may result in the loss of points. Notify the instructor in advance of any absence for in- or out-of-class activities. Note that work may not be made up after the fact, only turned in early (informing after the fact will result in a zero for the assignment).

Use of any form of tobacco or alcohol in the classroom is considered inappropriate for this classroom. Cell phones and other devices should be turned off or otherwise left at home. If you need to answer your phone during class, you need to leave the room; re-admittance may or may not be permitted. Other activity that diminishes the professional quality of the class-room will not be tolerated.

Classroom Conduct Policy

In an effort to create and foster a better learning environment in the classroom, the following policies have been adopted:

1. Student cell phones are to be turned off during class. If you are expecting a critical call, set your phone to vibrate, and let me know before class that you may have to step out.
2. Use of computers during class is strictly limited to course related activities.
3. Do not get up and leave the classroom during a lecture. If there is a critical conflict, let me know before class so that it's not taken as unprofessional
4. All unnecessary classroom disturbances such as trips to the bathroom, getting a drink at the water fountain and so forth are prohibited unless it is an emergency situation.

Other activities that diminish the professional quality of the classroom will not be tolerated. Failure to comply with the policies and procedures above will result in a two (2) point deduction from the student's final grade in the course.

Calculator Policy

You will only be allowed to use an NCEES approved calculator on exams, the same calculators used on the FE and PE exams. This list changes from time to time, but the most recent version can be found at <http://ncees.org/exams/calculator-policy/>. As of 2015, this is limited to:

Casio : All FX-115 models

HP: HP33s and HP35s models

TI: All TI 30X and TI36X models

If you don't have the right calculator for the tests or the final, you won't be allowed to use your "regular" calculator, or pass a classmate's calculator back and forth, or use a calculator on your cell phone. I might have one, but quantities are sure to be limited.

Ethics

As a student at WKU, you are expected to refrain from any form of academic dishonesty or deception such as cheating, stealing, plagiarism or lying on assignments, homework, quizzes, tests or exams. Executing or participating in academic dishonesty risks the consequences of such behavior, as stated in the WKU Catalog under Academic Dishonesty.

Further, you are training to be a professional engineer. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness, and equity, and must be dedicated to the protection of the public health, safety, and welfare.

Put simply, if you feel the need to cheat in order to finish any of the material (say, by copying out of solutions manuals or copying the submissions of your fellow students), or try to present your skills as more than they are, you are pursuing the wrong degree.

Student Disability Services

In compliance with university policy, students with disabilities who require accommodations (academic adjustments and/or auxiliary aids or services) for this course must contact the Office for Student Disability Services in DUC A-200 of the Student Success Center in Downing University Center. The phone number is 745-5004.

Please DO NOT request accommodations directly from the professor or instructor without a letter of accommodation from the Office for Student Disability Services.