ENGR211: STATICS
FALL 2008

Instructor: C.J. Riley (you may call me C.J.)
Office: Owens 113
Office Hours: Mondays and Wednesdays from 1pm to 3pm and Tuesdays from 10am to 11am, or when my door is open, or by appointment
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Class: Mondays, Wednesdays, Thursdays and Fridays from 10:00 to 10:50 am in Owens 223.

Prerequisites: MATH 252 – Integral Calculus

Text: Engineering Mechanics – Statics, 11th Edition, R.C. Hibbeler

Course Description:
Statics is the fundamental basis for continued study in structural analysis and mechanics of solids and fluids. Upon completion of the course you will have an intimate understanding of the concept of static equilibrium and its application to rigid structural and mechanical systems. Specifically, you will be able to analyze the internal and reaction forces of loaded systems of axial, torsional, and beam type members.

Topics:
- Background physical concepts
- Units
- Analysis procedure for engineering problems
- Vector mathematics and representation of forces
- Free-body diagrams
- Planar and spatial force equilibrium
- Force and moment resultants
- Rigid body equilibrium
- Force analysis of trusses, beams, and frames
- Center of gravity, centroid, and moment of inertia
- Dry friction

Objectives:
- Develop a fundamental understanding of the static equilibrium of particles and rigid bodies and methods of mathematical representation.
- Develop an ability to manipulate the vector representations of forces.
- Analyze internal and resultant forces in statically determinate trusses, beams, and frames.
- Develop a familiarity with shear and moment diagrams and their mathematical basis.
- Determine the location of centers of gravity and area, quantify cross sectional properties like area and moment of inertia and understand their implications with respect to engineering design.
- Effectively communicate an engineering problem solution by showing (1) the problem, (2) the method of solution, and (3) the result.

Grading: This may vary depending on the success of the class in general, but you can calculate your grade by compiling simple weighted averages of your work:

- A: 90-100%
- B: 80-90%
- C: 70-80%
- D: 60-70%
- F: <60%

Actual grades will be made available upon request as the course progresses. The weighting of assigned work is as follows:

- Homework: 30% - Assigned Mondays through Friday as covered and due every Monday
- Midterm Exams (4): 40% (10% each given every two weeks)
- Final (Comprehensive): 30%

Comments:

- Given that this is a course in very fundamental material, you should pay very close attention to the details of your work and seek to understand *why* you are doing what you are doing. It is often easy to simply solve problems without regard for what they mean or why you are doing them. Don't fall into this trap! By working the problems in this class you are building skills that you will continue to develop in future classes. These skills will serve you beyond your time in this course. Start developing good habits here and you will see benefits well into the future!
- I encourage working together to solve problems, but what you turn in should be your individual work. Formulating a strategy or reinforcing concepts with others is a great way to learn, but you should write your solution based on your own efforts. Any problem solutions that match in format and in error will be cause for concern on my part. Don't put yourself or me in the position of having to deal with academic dishonesty. It's not worth it. I am available and willing to help with any comprehension issues you have. Take full advantage of me in that regard via office hours and class participation.
- Some instructors will enumerate every detail of a good solution to an engineering problem down to the type of lead you should use. I will not do this here, but I will stress that you follow the outline presented in the textbook example problems as far as diagrams to draw and information to give. I require that you
    - start each problem at the top of a new page
    - rewrite the problem statement on the sheet where you provide the solution and box the final answer
    - place your name and a page number on your homework
    - use a ruler to draw straight lines
    - write neatly…even if you normally have terrible penmanship, you can write more slowly and neatly. Try all caps. It looks snazzy.

  Note that I didn't enumerate above…those are bullet points!

Annoying details:

- Cell phones – please set them to vibrate in class, don't look at them, and don't text during class. If everyone's cell phone vibrates at the same time then there's an emergency on campus and we probably should look at our phones.
- Academic honesty – the university policy on this (effectively a two-strike policy) is very serious. Don't make the mistake of violating it.