

Course Syllabus
Fall 2013 – CIVE 260 – Engineering Mechanics - Statics

Colorado State University
Department of Civil and Environmental Engineering
Fall 2013
CIVE 260-003 - Engineering Mechanics-Statics (3-0-0)



Instructor: Dr. Ryan Bailey

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Office phone: 491-5045 (will change mid-September)

Office location: Engineering A207-G (will move to A209 mid-September)

Office hours: T-R 1:00 – 2:00

Class Time: 12:00 – 12:50 pm

Class Location: Clark C144

Exam Time: See Course Outline below

Exam Location: See Course Outline below

Class Website: <https://ramct.colostate.edu/> The RamCT website will be used to post homework assignments, additional instructional material, announcements, etc.

Course Overview

Course Description:

Statics is the branch of engineering mechanics that is concerned with the analysis of forces on physical systems in static equilibrium. It will also help you interpret the forces supporting objects we encounter in our daily lives.

Course Objectives:

Upon completion of this course you will be able to:

- Understand the basic principles that govern the static equilibrium of bodies under the action of forces
- Apply the knowledge and tools of statics to solve engineering problems

You should also expect to:

- Take responsibility for your learning
 - Read textbook on your own
 - Ask questions: to myself, your classmates and yourself
 - Turn in excellent assignments demonstrating your knowledge of the solution
- Become an active participant in your Statics education, taking full advantage of lectures, texts, homework, and office hours.

Teaching Philosophy: The successful completion of this course requires your attention, hard work, and respect. In return, I will strive to create a classroom setting that encourages learning, critical thinking, and respect for all students. I will endeavor to meet your academic needs, and as such encourage all students to take advantage of the weekly office hours. I enjoy helping students outside of the classroom. However, please be respectful of my time, as I have other duties to perform within the department. This course will be challenging, but your hard work will be rewarded by positive feedback, representative grades, and better understanding of the mechanical and dynamic world and necessary preparation for future courses.

Academic Integrity: Academic dishonesty is extremely serious. University rules, including academic penalty and further investigation by the university authorities, will be strictly enforced in this course. Please review the CSU Student Code for details regarding these rules. I know that solution manuals are available for most textbooks on the internet. Copying from them not only will prevent you from learning, and thereby result in lower exam scores, but also may lead to dismissal from the course.

Group Work: Copying of assignments is prohibited. However, I encourage you to work alongside each other as you work on homework assignments. The interaction of teaching and learning within a group setting is a great way to learn the principles taught in class. Of course, exams are a purely individual responsibility.

Course Logistics

Textbook: Engineering Mechanics: Statics. 13th Edition, by R.C. Hibbeler, published by Pearson 2013.

Calculators: Only FE permitted calculators listed below will be allowed for use on Exams. No cell phones, laptops, or any other electronic device may be used.

| | |
|--------------------------|---|
| Casio | All fx-115 models. Any Casio calculator must contain fx-115 in its model name |
| Hewlett Packard | The HP 33s and HP 35s models, but no others |
| Texas Instruments | All TI-30X and TI-36X models. Any Texas Instruments calculator must contain either TI-30X or TI-36X in its model name |

Laptops and Tablets: You do not need a laptop or tablet in this course. Please do not bring them to class.

Course Grading:

The grading breakdown is as follows:

- Homework 20%
- Midterm Exams (3) 20% each
- Final Exam 20%

Term grades for this course will use the \pm grading system as described in the CSU catalog. Grades will be assigned according to the following range:

| | |
|-----------|---|
| 90 – 100% | A |
| 80 – 89% | B |
| 70 – 79% | C |
| 60 – 69% | D |
| < 60% | F |

This range will not be shifted up. However, it may be shifted down based on relative difficulty of homework exercises and exams. If, at the end of the semester, a student's score is 0.5% from a higher grade, then that student will receive the higher grade *if* the student's semester homework score is higher than the student's overall semester score.

Reading Assignments: Reading assignments will be assigned daily to complement lectures. Ideally, the assigned material should be studied prior to the corresponding lecture. You are responsible for the assigned readings besides the content that is presented during lectures.

Homework:

- **Assignments:** Homework assignments will be posted and announced in class each Friday. Assignments are due the following Friday by the end of the class period. Homework must be turned in to the instructor in the classroom. ***No late homework assignments will be accepted.*** However, your lowest homework grade will be dropped.
- **Completion of Assignments:** Assignments should follow a format similar to that used by professional engineers. Assignments should be written clearly on one side of engineering paper. Diagrams or graphs should be given when necessary. They should be clearly labeled and contain enough information so that they can stand alone.
- **Guidelines:** Each homework set should meet the following 9 guidelines (points will be taken off for failing to meet these guidelines):
 1. Paper. Engineering paper, problems (maximum 2 per page) on only one side.
 2. Name. Name, course #, and assignment written on every page.
 3. Problem. Define the problem, including a list of known/unknown parameters.
 4. Sketch. Sketch the problem and a free body diagram (when appropriate).
 5. Steps. Show each step explicitly so that your work can be easily followed.
 6. Equations. Label each equation used in the problem: (1), (2), (3), etc...
 7. Units. Write down units throughout the problem.
 8. Answer. Include units and box your answer.
 9. Clasp. Staple the homework set before turning in.
- **Grading System:**
 1. Each homework assignment will consist of at least 4 problems
 2. Two problems (not indicated until after the assignment has been turned in) will be thoroughly graded, each worth 0 to 5 points
 3. Remaining problems will be checked for completeness, each worth 0 (not complete) or 1 (complete) point.

Exams: There will be 3 evening exams and a Final Exam. Exam material will be drawn from lectures and from the textbook. Collaboration or copying from others during an exam will not be tolerated and may result in 0 credit, dismissal from the class, and referral to Student Conduct Services. *One side of one page of notes will be allowed for each exam, with two sides of a single page allowed for the final.* Each exam will be preceded by an in-class review session.

Makeup exam policy: For students who cannot attend regular exams due to university business duty, serious illness, or family emergency (all with written proof), a makeup exam may be arranged AFTER the regular exam. The instructor must be notified prior to the exam, and no exceptions will be made without a legitimate reason and a timely arrangement.

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Course Outline

***Daily topics may change**

| Date | Day | Topic | Topic Details* | Reading | HW |
|------------|-----|----------------------------|---|-------------------|-------|
| 8/26/2013 | Mon | Introduction | Review syllabus, Fundamental Concepts | 1.1 - 1.6 | |
| 8/28/2013 | Wed | | Fundamental concepts, Course Outline | 1.1 - 1.6 | |
| 8/30/2013 | Fri | Force Systems | 2D Force Systems | 2.1 - 2.4 | HW 1 |
| 9/2/2013 | Mon | LABOR DAY | | | |
| 9/4/2013 | Wed | Force Systems | 2D Force Systems | 2.1-2.4, 4.1-4.7 | |
| 9/6/2013 | Fri | | 2D Force Systems, 3D Force Systems | 2.1-2.4, 4.1-4.7 | HW 2 |
| 9/9/2013 | Mon | | 3D Force Systems | 2.5-2.9, 4.1-4.7 | |
| 9/11/2013 | Wed | | 3D Force Systems | 2.5-2.9, 4.1-4.7 | |
| 9/13/2013 | Fri | Equilibrium | Equations and Methods | 5.1 - 5.4 | HW 3 |
| 9/16/2013 | Mon | | Equilibrium in 2D | 5.1 - 5.4 | |
| 9/18/2013 | Wed | | Equilibrium in 2D | 5.5 - 5.7 | |
| 9/20/2013 | Fri | | Equilibrium in 3D | 5.5 - 5.7 | HW 4 |
| 9/23/2013 | Mon | Review for Exam 1 | Review for Midterm Exam #1 | | |
| 9/25/2013 | Wed | EXAM 1 evening exam | 5:00-6:50pm Plant Sciences C 101 | | |
| 9/27/2013 | Fri | Equilibrium | Equilibrium in 3D | 5.5 - 5.7 | |
| 9/30/2013 | Mon | Structural Analysis | Introduction to Trusses | 6.1, 6.3 | |
| 10/2/2013 | Wed | | Methods of Analysis | 6.2 | |
| 10/4/2013 | Fri | | Methods of Analysis | 6.4 | HW 5 |
| 10/7/2013 | Mon | | Space Trusses | 6.5 | |
| 10/9/2013 | Wed | | Truss Review Problems | | |
| 10/11/2013 | Fri | | Frames and Machines | 6.6 | HW 6 |
| 10/14/2013 | Mon | Distributed Forces | Center of Gravity, Mass; Centroids | 9.1-9.4, 9.3, 4.9 | |
| 10/16/2013 | Wed | | Application to Structures | 9.5 | |
| 10/18/2013 | Fri | | Application to Structures | | HW 7 |
| 10/21/2013 | Mon | Internal Forces | Internal Loadings | 7.1 | |
| 10/23/2013 | Wed | | Shear and Moment Equations and Diagrams | 7.2 | |
| 10/25/2013 | Fri | | Shear and Moment Equations and Diagrams | 7.3 | HW 8 |
| 10/28/2013 | Mon | Review for Exam 2 | Review for Midterm Exam #2 | | |
| 10/30/2013 | Wed | EXAM 2 in evening | 5:00-6:50pm Plant Sciences C 101 | | |
| 11/1/2013 | Fri | Friction | Introduction to Friction | 8.1 | |
| 11/4/2013 | Mon | | Problems involving Friction | 8.2 | |
| 11/6/2013 | Wed | | Problems involving Friction | 8.2 | |
| 11/8/2013 | Fri | | Friction in Machines | 8.3 - 8.7 | HW 9 |
| 11/11/2013 | Mon | | Friction in Machines | 8.3 - 8.7 | |
| 11/13/2013 | Wed | | Friction: Review Problems | | |
| 11/15/2013 | Fri | Virtual Work | Principle of Virtual Work | 11.1 - 11.3 | HW 10 |
| 11/18/2013 | Mon | | Equilibrium Problems | 11.1 - 11.3 | |
| 11/20/2013 | Wed | | Equilibrium Problems | 11.1 - 11.3 | |
| 11/22/2013 | Fri | | Potential Energy | 11.4 - 11.5 | HW 11 |
| 11/25/2013 | Mon | FALL RECESS | | | |
| 11/27/2013 | Wed | FALL RECESS | | | |
| 11/29/2013 | Fri | FALL RECESS | | | |
| 12/2/2013 | Mon | Review for Exam 3 | Review for Midterm Exam #3 | | |
| 12/4/2013 | Wed | EXAM 3 in | 5:00-6:50pm Plant Sciences C 101 | | |

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| evening | | | | |
|---------------------------|-----|--------------------------------|--|-------------|
| 12/6/2013 | Fri | Topics for Next Courses | Areal Geometrical Properties | 10.1 - 10.6 |
| 12/9/2013 | Mon | | Areal Geometrical Properties | 10.1 - 10.6 |
| 12/11/2013 | Wed | | Mass Moment of Inertia | 10.8 |
| 12/13/2013 | Fri | Final Day of Class | Review for Final Exam Complete course evaluations | |
| 12/19/2013 4:10-6:10pm | Mon | FINAL EXAM | | |
| 12/23/2013 | Mon | Grades Due | | |