Syllabi for Statics Courses

The two syllabi included in this document were used during statics courses that were taught as part of a research study on the effect on student outcomes of introducing projects to a traditional lecture course.

This study was supported by the National Science Foundation under Grant No. 1137023 Research Initiation Grant: Problem/Project-Based Learning in Statics, a Stepping Stone to Engineering Education Research. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Syllabus for Comparison Section
CIVE 260 – Engineering Mechanics – Statics
Section 1 Fall 2012
MWF 12:00-12:50pm Natural Resources 113

Instructor:
Dr. Rebecca Atadero
Office : A207J Engineering
Email : Rebecca.Atadero@colostate.edu
Phone : 491-3584
Course Website: RamCT
Office Hours: MW 2:30-3:30 pm, T 10:00-11:00 am
The grader will also have office hours from 10:00am-noon on Tuesdays in Engineering E116.

Course Objectives:
- To idealize, model and analyze 2D and 3D determinate structures and mechanical systems in static equilibrium.
- To prepare students for future courses in engineering mechanics and design by teaching problem solving skills and critical thinking.

By the end of the semester students should be able to:
- Solve for forces required to establish equilibrium of particles and rigid bodies in 2D and 3D.
- Perform vector operations including breaking a force into rectangular components and finding vector resultants.
- Isolate an appropriate portion of a system or problem and draw accurate free body diagrams of the isolated portion.
- Apply equilibrium equations to structures/systems including: cable and pulley systems, trusses, beams, frames, and machines.
- Calculate cross-sectional properties including centroids and area moments of inertia
- Solve equilibrium problems including the effect of dry friction.
- Solve equilibrium problems for machines with many configurations using virtual work.

ABET Outcomes Addressed:
(a) an ability to apply knowledge of mathematics, science, and engineering
(e) an ability to identify, formulate, and solve engineering problems

Required Text:
Meriam, J.L. and Kraige, L.G. *Engineering Mechanics – Statics*, 7th edition. Hoboken, NJ: Wiley, 2011.

Prerequisites: MATH 160, PH 141

Assignments and Grading:
Homework Assignments (15%)
A few textbook problems will be assigned most days. Although they will not be due until at least one week after they are assigned, I encourage you to at least attempt the assignments before the next class session. This will help you keep up to date on the material. These assignments should be completed individually. Although I encourage you to consult with other students and me when necessary, make sure you give every problem a reasonable amount of effort before seeking help. Remember that working through the problems is one of the best ways to learn the material and

prepare for tests, and that homework is assigned to give you practice and help you learn – not because grading is fun.
Assignments will be due by **3:00pm** on the assigned due date. They can be submitted in class, to my office or to my mailbox in the main CEE office. **Late assignments will not be accepted.**

Give special attention to the organization, neatness and completeness of your assignments. Engineers must be able to communicate their work to each other, and hand calculations are part of the design documentation process. It is important to practice this and form good habits while you are a student. (It will also be helpful when you review your assignments before an exam). Please follow the guidelines below. Assignments that do not follow these guidelines may not be graded at the discretion of the grader.

Homework Guidelines

1. Put your First and Last name on the assignment
2. Use engineering paper
3. Use one side of the paper
4. Number the pages and staple them together
5. Put no more than 2 problems on one page
6. Read the question completely to ensure you are providing the requested answer. Provide a brief restatement of the problem on your assignment.
7. Draw neat and accurate free body diagrams and sketches (use a straightedge when appropriate).
8. Show all work (If you do not show the work that led to your answer you will not receive credit).
9. Box or underline your final answer(s).
10. Watch units and significant figures on your answer.

Class Participation/Behavior (10%)
Iclickers will be used to give students credit for class participation during the lecture. Roughly two-thirds of the clicker grade will be based on participation and the remaining one-third will be based on correctness. In order to receive a participation grade, you will need to register your iClicker remote online within the first two weeks of class. To do this, go to:

clicker.colostate.edu/registration.aspx

Login with your eIdentity eName and password. In the iClicker ID field, enter your remote ID and select the "Register" button. The remote ID is the number found on the back of your iClicker remote. iClicker will be used every day in class, and you are responsible for bringing your remote daily.

I also expect students to be respectful to me and their classmates during class. One percentage point will be subtracted for each occurrence of disrespectful behavior such as (but not limited to) students holding private conversations while I am talking or disruptive entrances and exits from the classroom. Students who continue to display disruptive behavior after they have lost 5% will be referred to the Office of Conflict Resolution and Student Conduct Services.

Completion of surveys related to the research being conducted about this course (or alternative assignments for students who choose not to participate in the research) will also count toward your participation grade. Up to 2% points can be lost for failure to complete the surveys or alternative assignments.

Exams (75%)

There will be three midterms (15% each) in this class and a final (30%). All tests will be cumulative with an emphasis on more recent material. **Students must use a FE approved calculator on exams.** Tests will be closed book.

The midterms will be given in class, and are scheduled for Wednesday September 26th, Friday October 26th, and Wednesday November 28th. The final exam will be given on Tuesday, May 11th from 9:40-11:40am as scheduled by the university. Make-up exams will be given only in extraordinary, documented circumstances.

I am often asked about the best way to prepare for tests. I firmly believe that the best way to prepare is to learn the material as we go and just spend a few hours reviewing your old homeworks, and notes before the test.

Final Grades
Term grades for this course will be assigned using +/- grading. Remember these grades are a reflection of your work throughout the semester. You need to start worrying about your final grade NOW. By the time we get to December it is too late.

Academic Integrity:
This course will adhere to the Academic Integrity Policy of the Colorado State University General Catalog (online at http://catalog.colostate.edu/FrontPDF/1.6POLICIES1112f.pdf) and the Student Conduct Code (online at http://www.conflictresolution.colostate.edu/conduct-code.aspx).

As stated by the Catalog ***"Academic integrity is conceptualized as doing and taking credit for one's own work."*** In this class some work will be completed by individuals and some work will be completed in groups. Below I have described in general terms how academic integrity applies to each graded component. This description is not all inclusive, please contact me if you have questions about behaviors not specifically described here.

Exams will include the following honor pledge for you to sign:

I pledge on my honor that I have not received or given any unauthorized assistance in this exam.

Homework Assignments – Students are encouraged to consult with and learn from each other, but the final submitted assignment must reflect the individual effort and understanding of the student submitting the assignment. Direct copying is not acceptable and in this case all students with the same work will be given a zero.

Exams – The midterm and final exams should be completed individually without aid from other students. Exams must be taken with FE approved calculators.

Class Participation/Behavior – If students are absent from class they should not ask other students to use their iclicker for them, and you should not use the iclicker for people who are not in class.

Special Needs:
If you have any special needs please come visit me during office hours so that we can discuss how I can help you be successful in this course.

Syllabus for Intervention Section
CIVE 260 – Engineering Mechanics – Statics
Section 2 Fall 2012
MWF 1:00-1:50pm TILT 221

Instructor:
Dr. Rebecca Atadero
Office : A207J Engineering
Email : Rebecca.Atadero@colostate.edu
Phone : 491-3584
Course Website: RamCT
Office Hours: MW 2:30-3:30 pm, T 10:00-11:00 am
The grader will also have office hours from 10:00am-12:00pm on Tuesdays in _____

Course Objectives:
- To idealize, model and analyze 2D and 3D determinate structures and mechanical systems in static equilibrium.
- To prepare students for future courses in engineering mechanics and design by teaching problem solving skills, critical thinking, and the engineering design process.

By the end of the semester students should be able to:
- Solve for forces required to establish equilibrium of particles and rigid bodies in 2D and 3D.
- Perform vector operations including breaking a force into rectangular components and finding vector resultants.
- Isolate an appropriate portion of a system or problem and draw accurate free body diagrams of the isolated portion.
- Apply equilibrium equations to structures/systems including: cable and pulley systems, trusses, beams, frames, and machines.
- Calculate cross-sectional properties including centroids and area moments of inertia
- Solve equilibrium problems including the effect of dry friction.
- Solve equilibrium problems for machines with many configurations using virtual work.
- Describe and apply the engineering design process.

ABET Outcomes Addressed:
(a) an ability to apply knowledge of mathematics, science, and engineering
(c) an ability to design a system, component, or process to meet desired needs …
(d) an ability to function on multidisciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(g) an ability to communicate effectively

Required Text:
Meriam, J.L. and Kraige, L.G. *Engineering Mechanics – Statics*, 7th edition. Hoboken, NJ: Wiley, 2011.

Prerequisites: MATH 160, PH 141

Assignments and Grading:
Group Design Projects (30% total, 3 projects at 10% each)
The course will be divided into three units: 1) Equilibrium, 2)Applications, and 3) Friction & Virtual Work. A group design project will be assigned at the beginning of each unit. Projects will require students to work in groups to design and construct an engineering system to be demonstrated to

the class and to write a report describing the design process. The assignment sheet for each project will include specific design and reporting requirements and a detailed breakdown of how points will be assigned. Some time for group work will be provided in class. Project presentations will use the evening exam time specified in the schedule of courses. Presentations will be made from 5-7pm on **Wednesday September 19th, Wednesday October 24th and Wednesday December 5th** in Clark A201**.**

Homework Assignments (13%)
A few textbook problems will be assigned most days. Although they will not be due until at least one week after they are assigned, I encourage you to at least attempt the assignments before the next class session. This will help you keep up to date on the material. These assignments should be completed individually. Although I encourage you to consult with other students and me when necessary, make sure you give every problem a reasonable amount of effort before seeking help. Remember that working through the problems is one of the best ways to learn the material and prepare for tests, and that homework is assigned to give you practice and help you learn – not because grading is fun.

Assignments will be due by **3:00pm** on the assigned due date. They can be submitted in class, to my office or to my mailbox in the main CEE office. **Late assignments will not be accepted.**

Give special attention to the organization, neatness and completeness of your assignments. Engineers must be able to communicate their work to each other, and hand calculations are part of the design documentation process. It is important to practice this and form good habits while you are a student. (It will also be helpful when you review your assignments before an exam). Please follow the guidelines below. Assignments that do not follow these guidelines may not be graded at the discretion of the grader.

Homework Guidelines

11. Put your First and Last name on the assignment
12. Use engineering paper
13. Use one side of the paper
14. Number the pages and staple them together
15. Put no more than 2 problems on one page
16. Read the question completely to ensure you are providing the requested answer. Provide a brief restatement of the problem on your assignment.
17. Draw neat and accurate free body diagrams and sketches (use a straightedge when appropriate).
18. Show all work (If you do not show the work that led to your answer you will not receive credit).
19. Box or underline your final answer(s).
20. Watch units and significant figures on your answer.

Class Participation/Behavior (7%)
Iclickers will be used to give students credit for class participation during the lecture. Roughly two-thirds of the clicker grade will be based on participation and the remaining one-third will be based on correctness. In order to receive a participation grade, you will need to register your iClicker remote online within the first two weeks of class. To do this, go to:

clicker.colostate.edu/registration.aspx

Login with your eIdentity eName and password. In the iClicker ID field, enter your remote ID and select the "Register" button. The remote ID is the number found on the back of your iClicker remote. iClicker will be used every day in class, and you are responsible for bringing your remote daily.

I also expect students to be respectful to me and their classmates during class. One percentage point will be subtracted for each occurrence of disrespectful behavior such as (but not limited to) students holding private conversations while I am talking or disruptive entrances and exits from the classroom. Students who continue to display disruptive behavior after they have lost 5% will be referred to the Office of Conflict Resolution and Student Conduct Services.

Completion of surveys related to the research being conducted about this course (or alternative assignments for students who choose not to participate in the research) will also count toward your participation grade. Up to 2% points can be lost for failure to complete the surveys or alternative assignments.

Exams (50%)
There will be three midterms (10% each) in this class and a final (20%). All tests will be cumulative with an emphasis on more recent material. **Students must use a FE approved calculator on exams.** Tests will be closed book.

The midterms will be given in class, and are scheduled for Wednesday September 26th, Friday October 26th, and Wednesday November 28th. The final exam will be given on Monday, December 10th from 2:00-4:00pm as scheduled by the university. Make-up exams will be given only in extraordinary, documented circumstances.

I am often asked about the best way to prepare for tests. I firmly believe that the best way to prepare is to learn the material as we go and just spend a few hours reviewing your old homeworks, and notes before the test.

Final Grades
Term grades for this course will be assigned using +/- grading. Remember these grades are a reflection of your work throughout the semester. You need to start worrying about your final grade NOW. By the time we get to December it is too late.

Academic Integrity:
This course will adhere to the Academic Integrity Policy of the Colorado State University General Catalog (online at http://catalog.colostate.edu/FrontPDF/1.6POLICIES1112f.pdf) and the Student Conduct Code (online at http://www.conflictresolution.colostate.edu/conduct-code.aspx).

As stated by the Catalog ***"Academic integrity is conceptualized as doing and taking credit for one's own work."*** In this class some work will be completed by individuals and some work will be completed in groups. Below I have described in general terms how academic integrity applies to each graded component. This description is not all inclusive, please contact me if you have questions about behaviors not specifically described here.

Exams will include the following honor pledge for you to sign:

I pledge on my honor that I have not received or given any unauthorized assistance in this exam.

Group Design Projects – Group projects should reflect the effort of the students in the group. If external sources are referenced when writing project reports, they should be cited; please see me or the website for the CSU Writing Center if you need help with this. Furthermore, in a group setting, I interpret academic integrity as pulling your own weight within a group.

Homework Assignments – Students are encouraged to consult with and learn from each other, but the final submitted assignment must reflect the individual effort and understanding of the student submitting the assignment. Direct copying is not acceptable and in this case all students with the same work will be given a zero.

Exams – The midterm and final exams should be completed individually without aid from other students. Exams must be taken with FE approved calculators.

Class Participation/Behavior – When I ask for group work during class sessions it is important that each student participates in the assignment, so as not to compromise the learning opportunity of other students. If students are absent from class they should not ask other students to use their iclicker for them, and you should not use the iclicker for people who are not in class.

Special Needs:
If you have any special needs please come visit me during office hours so that we can discuss how I can help you be successful in this course.