

CE 2343: Structural Analysis

Department of Civil Engineering



Instructor

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Office Hours: Tuesday/Friday 8AM to 10AM (Most days, Dr. Weidner will be present as well)

Course Description

From the university course catalog:

A study of framed structures, trusses, girders, beams including applications of static and moving loads and bridges

My description:

A study of structural forms, components, actions, and responses stemming from various loading scenarios including both classical and computer (finite element modeling) solution approaches with a focus on current practice and trends.

Course Objectives

By the end of this course you should be able to:

1. Identify structural components, applicable loads, and requisite analysis assumptions
2. Rapidly assess simple structures for stability and determinacy (review)
3. Apply mechanics principles to solve static equilibrium problems (review)
4. Solve for forces in statically determinate trusses (review)
5. Draw shear and moment diagrams for beams and frames (review)
6. Draw influence lines for reactions, forces, shears and moments
7. Determine internal forces in arches and cables
8. Estimate deflections in beams, frames, and trusses
9. Solve for simple statically indeterminate structures using classical methods
10. Develop a stiffness matrix and solve simple problems using matrix methods
11. Develop an understanding of current structural engineering practice
12. Document structural calculations and understand the responsibility of an engineer
13. Use the internet as a resource to obtain information in support of structural analyses
14. Use and interpret results of structural analysis software

Grading

Exams:	25% for Mid-term 1 25% for Mid-term 2 25% for Final Exam
Quizzes:	15%
Homework:	10%

Exams will be in-class and closed book. The final exam will be cumulative. Only NCEES approved calculators will be permitted, as these are what is allowed for the Fundamentals of Engineering exam. Visit the NCEES website (<http://ncees.org/exams/calculator/>) for more information.

Quizzes will be online using the Pearson Mastering Engineering system, or in class, depending on the material. .

There will be three types of homework assignments. The first type of homework assignments will be primarily designed to provide you with ample practice for a certain technique. These assignments will be through the Mastering Engineering system. The second type of homework assignment will be using RISA 2D, the provided structural analysis software package. The third type of homework will be conceptual and comprehensive problems that you will solve completely and I will grade very thoroughly.

Neatness Policy

Part of being an engineer is executing tasks in a neat, understandable and repeatable manner. This is a critical aspect of engineering education that is often overlooked. In this class, I ask that you do the following:

- Complete homework assignments on engineering paper (available in the bookstore or on Amazon). Loose-leaf paper is not permitted.
- Homework must be stapled.
- Use sharp pencils and a straight-edge for your work. Write precisely and neatly.
- Include your name on every page of your homework.
- Number, title and date the pages of your homework.
- Clearly sketch out any diagrams with labels as required.
- Box answers so they can be readily identified.
- List any external references used in the homework (i.e., textbook tables)

After three weeks of class, homework assignments which do not adhere to this policy will not be accepted.

Honor Code

Students are expected to adhere to the Honor Code of the Department of Civil Engineering, which can be found here (<http://ce.utep.edu/honorcode.htm>). Instances of suspected cheating or other violations of the Honor Code will be handled according to the procedures in the UTEP Handbook of Procedures.

Group Work Policy

Working in groups is encouraged for homework assignments, but everyone must submit their own work. Blatant copying is not permitted and both the copier and the person who provided their work to be copied will lose credit for the assignment.

Computer Policy

When explicitly required by the instructor, homework assignments must be checked using a contemporary structural analysis software package (RISA 2D is provided). If the output from a computer analysis is not submitted when required, no credit will be given for the assignment. Please see ETC to ensure that you have access to RISA through the Citrix My.Apps system used by UTEP.

Textbook

Hibbeler, R.C. 9th Edition

Note that this is the Mastering Engineering edition.