

## **CE 2343: Structural Analysis**

Department of Civil Engineering



### **Instructor**

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Office Hours: M/W 10:00-12:00 (other times by appointment)

### **Teaching Assistant**

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TBD

Office Hours: TBD

### **Course Description**

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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**

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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
3. Apply mechanics principles to solve static equilibrium and deformation problems
4. Solve for forces in statically determinate trusses
5. Draw shear and moment diagrams for beams and frames
6. Draw influence lines for reactions, forces, shears and moments
7. Estimate deflections in beams, frames, and trusses
8. Solve for simple statically indeterminate structures using classical methods
9. Develop an understanding of current structural engineering practice
10. Document structural calculations and understand the responsibility of an engineer
11. Use the internet as a resource to obtain information in support of structural analyses
12. Use and interpret results of structural analysis software

## ***Grading***

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Homework:	10% (No late homework accepted, but lowest grade is dropped)
Exams:	30% for Mid-term and 30% for Final Exam
Quizzes:	10% (Spread throughout the term)
Project/Paper:	15% (Details to follow)
Participation:	5% (Pilot Study on REEF Polling)

Homework will be a combination of problems from the book, and other problems that will be provided to you. Start a problem with one new sheet. Use only one side of a sheet. Write down the course number, problem number, and student name on the top line of each sheet. Staple each set of homework problems. All problems should contain a free body diagram. Neatness is essential. Give necessary details in the solution so that people can easily follow your calculations. **Homework assignments are subject to the computer policy below.**

Exams will be in-class and closed book. 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 very brief, generally at the start of classes.

A term project will be assigned early in the term. This project will be completed partially on an individual basis and partially in groups. The purpose of the project is to learn about current structural engineering practice, to think critically about real-world situations, and to develop presentation, writing and communication skills.

Participation will be determined based on how frequently you participate in in-class questions via REEF polling, a new classroom response system being piloted this term. It is free, and you can use your cell phone. Details for signing up will be posted on BlackBoard.

## ***Honor Code***

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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>).

## ***Computer Policy***

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When explicitly required by the instructor, all hand calculations must be checked using a contemporary structural analysis software package. If the output from a computer analysis is not submitted when required, no credit will be given for the assignment.

## ***References***

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Leet, K, C-M Uang, and A. Gilbert (2010) “Fundamentals of Structural Analysis,” 4<sup>th</sup> Edition, McGraw-Hill Science/Engineering/Math

White, R.N, P. Gergely, and R.G. Sexsmith (1976) "Structural Engineering," Combined Edition, Volumes 1 & 2, John Wiley and Sons, Inc.

McCormac, J.C. (2007) "Structural Analysis, Using Classical and Matrix Methods," 4<sup>th</sup> Edition, John Wiley and Sons, Inc.

Hibbeler, R.C. (2002) "Structural Analysis", 5<sup>th</sup> Edition, Prentice Hall, Upper Saddle River, NJ.