

UNIVERSITY OF UTAH
Department of Civil & Environmental Engineering
CVEEN 3210 Structural Loads and Analysis, Fall 2019
M, W, F 7:30 – 8:20 am

Instructor:

Luis Ibarra, luis.ibarra@utah.edu (801) 585-9307

Office hours:

Monday: 1:30 PM – 3:00 PM

Wednesday: 1:30 PM – 3:00 PM (Meldrum Building, Rm 2024).

Teaching Assistant:

Pratiksha Dhakal, pratiksha.dhakal@utah.edu

Office hours:

Tuesday: TBD

Thursday: TBD.

Course Objectives:

The objective of structural analysis is to assess the effects of external loads on structures. At the end of the course you should:

- Understand the fundamentals of structural loads.
- Draw deflected shapes of structures
- Calculate deflections of beams and trusses.
- Compute influence lines.
- Compute axial, shear, and moment forces on members of statically indeterminate structures.
- Use structural analysis software to analyze structural systems.

Prerequisites:

CVEEN 2140 (Strength of Materials) and MATH 2210 (Calculus III)

Textbook:

Hibbeler R.C. "Structural Analysis," 10th Edition. Editorial prentice Hall. 2017.

Recommended material:

Leet, K.M., and Uang, C.M. "Fundamentals of Structural Analysis." Ed. McGraw Hill.

Aslam Kassimali "Structural Analysis" 5th Edition. Cengage Learning.

ASCE 7-10, or 7-16. "Minimum Design Loads for Buildings and Other Structures," American Society of Civil Engineers.

Exams

- First Midterm (Design loads and statically determinate structures): W October 2nd (during class time).
- Second Midterm (Statically determinate structural analysis and deformations): F November 9th (during class time).
- Final exam (comprehensive with emphasis on statically indeterminate structures): Monday December 11, 2019 (8:00 – 10:00 am).

No quizzes ☺...

Review Sessions

Two tutorials on SAP2000 will be offered during the first month of classes.

If needed review sessions will be offered before some exams.

Lectures

For most lectures, handouts with blanks will be uploaded in Canvas before the topic is covered in the classroom.

Suggestion: Use a binder to place the material distributed during the semester.

Smart phones are prohibited. Computers and tablets can only be used in class when there is an activity that requires a laptop, or if the student is filling in HOs' blanks in these devices.

Homework

Homework will be assigned on weekly basis. HW is due at the start of the class of the due date (usually a week after it is assigned). Late HW will be graded for 80% credit. HWs can only be submitted during the following class after the deadline.

Solutions will be distributed when the HWs are returned. In some HWs, you will be encouraged to work in teams of two students. You can solve the HW with some of your classmates, even if you provide individual solutions, as long as you work independently and only consult the rest of the group. You cannot copy HW solutions from books, manuals, classmates, or any other source.

For problems requiring a computer program you can use SAP2000, STAAD, RAM, or any program you are familiar with. If you use SAP2000 you can help from the instructor and TA.

Canvas

Handouts, homework, and class electronic communication will be done in Canvas.

HOs with blanks will be uploaded in Canvas before the topic has been covered in the classroom. Bring them to class if you want to fill them in during the lectures. You can fill them in in a hard copy or using a tablet or computer.

Always use your university's email to contact the instructor and TAs.

Grade Weights

Homework	20%
First Midterm exam	25%
Second Midterm exam	25%
Final exam	30%

Grades

A- to A	90-100
B- to B+	80-89
C- to C+	70-79
D	60-69
E	<60

More grade information at:

<http://www.law.utah.edu/student-handbook/grading-system/>

Academic honesty:

The University of Utah rules of academic honesty apply to homework and exams (<http://www.admin.utah.edu/ppmanual/8/8-10.html>). Academic misconduct will be sanctioned as outlined therein.

Behavior in class:

- Be respectful with the rest of the class.
- Be sure to be in the classroom when the class starts, and do not leave earlier.
- Cell phones are not allowed during the class.
- Laptops are only allowed if we are discussing computer applications.

University Accommodation Policies:

The U of U seeks to provide equal access to services to people with disabilities. If you need accommodations in the class, you should notify the Center for Disability Services (581-5020, <http://disability.utah.edu/>). All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

CvEEN 3210 Content Overview

	Topic	Textbook Sections *	Approx Sessions
1	Introduction to Structural Analysis	-	1
Design Loads			
3	Dead and live Loads	1.1-1.3, 2.1-2.3	2
4	Snow Loads	1.3	2
5	Wind Loads	1.3	2
6	Seismic Loads	1.3	3
Statically Determinate Structural Analysis			
7	Stability and static determinacy*	2.4-2.5	‡
8	Analysis of statically determinate trusses	2.4-2.5, 3.1-3.6, 3.8	2
9	Axial, shear and moment diagrams for beams	2.5, 4.1-4.3, 4.5	2
10	Axial, shear and moment diagrams for frames	2.5, 4.4	3
11	Influence lines and highway loads	6.1-6.4, 6.6-6.7	4
Deformation of Beams and Trusses			
12	Double integration method	8.1-8.3	1
13	Moment area method	8.4	3
14	Virtual work method	9.1-9.4,9.7	3
Statically Indeterminate Structural Analysis			
15	Moment distribution method for beams	12.1-12.3	4
16	Moment distribution method for frames	12.4	4
17	Approximate methods	7.3-7.4	2
Special topics			
18	Cables	5.1-5.3	2
19	Arches	5.4-5.6	1
* Textbook sections correspond to the ninth textbook edition.			
‡ Stability and static determinacy is covered on truss, beam, and frame sections.			