CEE 465 Design of structural systems

Spring 2024

Instructor:	Ann Sychterz	**Time:**	M/W 10:00am - 11:50am
Email:	asychter@illinois.edu	**Place:**	Newmark 3019

Vision: Develop excellent engineers who understand the fundamental behavior of building structural systems and who can apply this understanding to the integrated design process, leading to safe and economical buildings with reliable performance.
Learning Objectives: This course will enable students to:

- Explain the principles and procedures for designing building structural systems
- Assess fundamental concepts of structural theory and mechanics related to behavior and engineering of building structural systems in the context of the integrated design process
- Design building structural systems using codes and specifications

Prerequisites: Credit in either CEE 460 or CEE 461.

Instructor:
Ann Sychterz, PhD
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Design Consultant:
James Pawlikowski, S.E., LEED AP
Principal, Datum Engineers, UIUC CEE Adjunct Professor
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Teaching Assistant:
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Office Hours:
Sychterz, Monday 12:00 pm to 1:00 pm Wednesday 8:30am to 9:30 ams (Newmark 2122)
Baruah, Tuesday 4:00pm to 5:00pm (Newmark 1233)
Pawlikowski, Friday 12:00 - 1:00pm (Online, select dates)
Course Pages: Canvas will be used to administer, distribute course material, to make course announcements and post questions. https://canvas.illinois.edu/courses/38179

Grading Policy:

- Project Submittals: 50% group grade. PS#1 5%, PS#2 10%, PS#3 15%, PS#4 20%
- Homework Assignments: 40% individual grade, HW#1 8%, HW#2 8%, HW#3 8%, HW#4 8%, HW#5 8%,
- Presentations: 10%, group grade (5% midterm, 5% final)

Project Teams: Teams of 4 people can be self-selected. However each team will need to have at least one student who has taken the concrete design course and one student that has taken the steel design course. Teams will submit their roster with each person's completed courses of CEE 460 or 461. Changes to team rosters by the instructor may be necessary to ensure a balance of experience.

Late Policy:

- Project submittals are to be compiled as one *.pdf document and submitted by one team member to the canvas course page by 11:55pm on the due date.
- Homework assignments are to be submitted as one *.pdf document to the canvas course page by 11:55pm on the due date.

- Late assignments without notification prior to deadline will receive a penalty of 5% per day to a maximum of 50%

Important Dates:

Project Submittal #1 due February 9, 2024
Project Submittal #2 due March 22, 2024
Project Submittal #3 due April 5, 2024
Project Submittal #4 due May 1, 2024
Homework #1 due February 5, 2024
Homework #2 due March 6, 2024
Homework #3 due March 27, 2024
Homework #4 due April 10, 2024
Homework #5 due May 1, 2024
Interm progress presentations March 25, 2024
Final presentations May 1, 2024

Academic Integrity: Development of excellent engineers includes the practice of integrity in outputted work. Please review Article 1, Part 4 - Academic integrity policy and procedure. https://studentcode.illinois.edu/article1/part4/1-401/

Disability Statement: To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603, e-mail disability@illinois.edu or go to the DRES website. If you are concerned you have a disability-related condition that is impacting your academic progress, there are academic screening appointments available on campus that can help diagnosis a previously undiagnosed disability by visiting the DRES website and selecting "Sign-Up for an Academic Screening" at the bottom of the page.

Anti-Racist and Inclusivity Statement: The Grainger College of Engineering is committed to the creation of an anti-racist, inclusive community that welcomes diversity along a number of dimensions, including, but not limited to, race, ethnicity and national origins, gender and gender identity, sexuality, disability status, class, age, or religious beliefs. The College recognizes that we are learning together in the midst of the Black Lives Matter movement, that Black, Hispanic, and Indigenous voices and contributions have largely either been excluded from, or not recognized in, science and engineering, and that both overt racism and micro-aggressions threaten the well-being of our students and our university community. If you witness or experience racism, discrimination, micro-aggressions, or other offensive behavior, you are encouraged to bring this to the attention of the course director if you feel comfortable. You can also report these behaviors to the Bias Assessment and Response Team (BART) (https://bart.illinois.edu/).

Safety information resources: This page contains safety information provided by UIUC Division of Public Safety. You are also encouraged to watch this two-minute video: http://police.illinois.edu/emergency-preparedness/run-hide-fight/ Emergencies can happen anywhere and at any time. It is important that we take a minute to prepare for a situation in which our safety or even our lives could depend on our ability to react quickly. When we're faced with any kind of emergency – like fire, severe weather or if someone is trying to hurt you – we have three options: Run, hide or fight.

Extra Credit and Perks:

Extra credit: 2% on the midterm presentation will be given if all students in the class complete the informal early feedback survey. 2% on the final presentation will be given if all students in the class complete the ICES evaluation for CEE 498 this semester.

Tentative Course Outline:

Date	Day	Topic
15.01	Monday	*MLK Day*
17.01	Wednesday	Course and project intro
22.01	Monday	Design criteria and codes
24.01	Wednesday	Live and snow load design example
29.01	Monday	VR activity
31.01	Wednesday	Composite Beam Design: Composite design
05.02	Monday	Composite Beam Design: Shear Stud Design
07.02	Wednesday	Composite Beam Design: Precomposite Design
12.02	Monday	Column design example part 1
14.02	Wednesday	Column and Framing seminar
19.02	Monday	Column design example part 2
21.02	Wednesday	Gravity connections example
26.02	Monday	Sustainability in design and LEED
28.02	Wednesday	Wind design seminar
04.03	Monday	Wind design example part 1
06.03	Wednesday	Wind design example part 2
11.03	Monday	*Spring Break*
13.03	Wednesday	*Spring Break*
18.03	Monday	Introduction to Structural Dynamics and Seismic
20.03	Wednesday	Progress meeting (individually with teams)
25.03	Monday	Interim progress presentations (formal)
27.03	Wednesday	Seismic design example part 1
01.04	Monday	Seismic design example part 2
03.04	Wednesday	LFRS design example
08.04	Monday	LFRS design example
10.04	Wednesday	Foundations: Base Plates
15.04	Monday	Foundations: Footings
17.04	Wednesday	Foundations: Walls
22.04	Monday	Deep foundations seminar and law
24.04	Wednesday	Intro to bridge design
29.04	Monday	Progress meeting (individually with teams)
01.05	Wednesday	Final presentations