

ARCH 260: Principles of Structures

Territorial Acknowledgement

We acknowledge that the School of Architecture is located on the traditional territory of the Neutral, Anishinaabeg and Haudenosaunee peoples. The University is situated on the Haldimand Tract, the land promised to the Six Nations that includes 10 kilometres on each side of the Grand River. (see references here: <https://uwaterloo.ca/engineering/about/territorial-acknowledgement>)

Instructor

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Teaching Assistant

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Lectures

Wednesdays 9am -1pm (several breaks included)

Recordings posted to LEARN

Tutorials

Fridays 2pm-4pm

Recordings posted to LEARN

Course Description

This course covers the fundamentals of mechanics as related to architectural design. Topics covered can be grouped into three categories: static analysis, strength of materials, and member design. Topics within static analysis are: structures in equilibrium, analysis of pinned frames, analysis of trusses, analysis of beams, the superposition principle and indeterminate structures. Strength of materials consists of: section properties, stress and strain. Member design will cover: the design of beams, the design of columns. About half the course will be dedicated to static analysis, while the remainder of the course will be split between the other two categories.

Learning Objectives

By the end of the course, students will be able to:

- Understand and apply the three equilibrium equations to analyze three types of determinate structures: pinned frames, trusses, and beams
- Draw shear and bending moment diagrams of beams
- Compute properties of member cross sections
- Use the superposition principle to analyze indeterminate beams
- Understand the concepts of stress and strain within solids
- Apply limits states design principles to design columns and beam

- Understand the difference between strength and stability

Required Text

Course note package available from the UW bookstore. Additional homework questions available on LEARN.

Grading

Final marks will be calculated on the following basis:

Assignments	30%
Midterm	30%
Final Exam	40%

Note: In the event you do not pass the final exam (mark is <50%), the following grading scheme applies:

Assignments	20%
Midterm Exam	20%
Final Exam	60%

It is imperative that you pass the final exam to do well in this course.

Assignments

There are weekly assignments in this course, more details are given in the Assignments Outline posted on LEARN. Submission criteria, group work policy, and late submission policy are also detailed in the Assignments Outline.

Homework

Each week, practice questions additional to the weekly assignment will be posted to LEARN. This work will not be evaluated but should be used to deepen your understanding of course topics and prepare for exams.

Exams

You are permitted to use your course note package to assist you during the Midterm and Final exam; however, from my own experience, it is unnecessarily time consuming to have to search through a book during a timed exam. It is strongly recommended that you summarize key formulas, concepts, and question methodologies on a single page for quick reference.

Topics & Schedule

The course schedule, which includes all evaluation dates, is provided in the ARCH 260 2020 Schedule document.

Remote Course Delivery Platforms & Communication

During remote learning, we will be using additional platforms to deliver, organize and share course content, learning and work. Here is a breakdown of tools we will use in this course:

All course announcements, course documents, and evaluations will be disseminated through LEARN. The idea is to reduce the number of platforms that you will have to juggle and LEARN is official university platform. Lectures and tutorials will be given through WebEx, and recordings will be posted to LEARN. Although other platform might be more user friendly, WebEx is endorsed by the university as the video conferencing platform of choice.

Course Time Zone

All dates and times communicated in the document are expressed in Eastern Time (Local time in Waterloo Ontario, Canada). From September 8 – October 24 2020 times are indicated in Eastern Daylight Time (EDT, UTC−4:00) and from October 25 – December 31 2020, times are indicated in Eastern Standard Time (EST, UTC−5:00)

Fall 2020 COVID-19 Special Statement

Given the continuously evolving situation around COVID-19, students are to refer to the University of Waterloo's developing information resource page (<https://uwaterloo.ca/coronavirus/>) for up-to-date information on academic updates, health services, important dates, co-op, accommodation rules and other university level responses to COVID-19.

Student Notice of Recording

The course's official *Notice of Recording* document is found on the course's LEARN site. This document outlines shared responsibilities for instructors and students around issues of privacy and security. Each student is responsible for reviewing this document.

All live lectures, tutorials, and seminars will be recorded and made available through LEARN. Students wishing not to be captured in the recordings have the options of participating through the direct chat or question and answer functions in WebEx.

Mental Health Support

All of us need a support system. We encourage you to seek out mental health supports when they are needed. Please reach out to Campus Wellness (<https://uwaterloo.ca/campus-wellness/>) and Counselling Services (<https://uwaterloo.ca/campus-wellness/counselling-services>).

We understand that these circumstances can be troubling, and you may need to speak with someone for emotional support. Good2Talk (<https://good2talk.ca/>) is a post-secondary student helpline based in Ontario, Canada that is available to all students.

Equity, Diversity and Inclusion Commitment

At the School of Architecture, we are committed to foster and support equity, diversity and inclusion. We recognize however, that discrimination does occur, sometimes through an isolated act of discrimination, but also through practices and policies that must be rewritten. If you ever experience

discrimination and need to report any instances of micro-aggressions and other forms of racism, sexism, discrimination against LGBTQ2S+, or disability, please note that there are different pathways to report these instances:

- A) if you feel comfortable bringing this up directly with the Faculty or person who has said or done something offensive, we invite you, or a friend, to speak directly with this person.
- B) If you do not wish to bring this up with this person directly, you are invited to reach out to either the undergraduate ([Donna Woolcott](#) or [Maya Przybylski](#)) or graduate office ([Nicole Guenther](#), [Lola Sheppard](#), or [Jane Hutton](#)). If you contact any of these people in confidence, they are bound to preserve your anonymity and will be able to follow up on the report. Alternatively, you may always reach out to director [Anne Bordeleau](#) directly, and she will protect your identity and follow up on the report.
- C) Finally, you may also choose to report centrally to the Equity Office. The Equity Office can be reached by emailing equity@uwaterloo.ca. More information on the functions and services of the equity office can be found here: <https://uwaterloo.ca/human-rights-equity-inclusion/about/equity-office>.

[Academic integrity, grievance, discipline, appeals and note for students with disabilities:](#)

Academic integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility.

[Check [the Office of Academic Integrity](#) for more information.]

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70, Student Petitions and Grievances, Section 4](#). When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for his/her actions. [Check [the Office of Academic Integrity](#) for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to [Policy 71, Student Discipline](#). For typical penalties, check [Guidelines for the Assessment of Penalties](#).

Appeals: A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals.

Note for students with disabilities: [AccessAbility Services](#), located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with [AccessAbility Services](#) at the beginning of each academic term.

Turnitin.com: Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin in this course.

It is the responsibility of the student to notify the instructor if they, in the first week of term or at the time assignment details are provided, wish to submit the alternate assignment.