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COURSE INSTRUCTOR	COURSE SCHEDULE
<p><b>Dr. Christian Viau</b> Department of Civil and Env. Engineering Email: <a href="mailto:christian.viau@carleton.ca">christian.viau@carleton.ca</a></p> <p>Office: Engineering Design Centre, Room 4535 Drop-in Hours: Tuesdays: 1:30 pm – 2:30 pm</p>	<p><u>Lectures:</u> Tuesdays: 2:35 pm – 5:25 pm TB 340</p> <p><u>Lab Sessions:</u> Fridays: 2:35 pm – 5:25 pm AT 102</p>

#### COURSE WEBSITE AND COMMUNICATION

All course information, assignments, and problem sets will be available through Brightspace. All students are responsible for ensuring that they are correctly registered through Brightspace and that they are receiving messages properly through their official university email address. Students are responsible for checking the Brightspace course management site and their official email account frequently. The announcement function in Brightspace will be used to send out any updates with important information related to the course.

#### COURSE DESCRIPTION AND OBJECTIVES

This course introduces principles of structural analysis for engineering structures. Learning structural analysis will provide you with important problem-solving concepts and skills that are applicable to the topic of structural engineering. To develop the skills required for this course you have to practice and participate in lectures, laboratory sessions, and other course elements.

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

- Understand the important structural analysis concepts of elasticity, equilibrium and compatibility.
- Understand and perform structural analysis using the methods of equilibrium.
- Understand and perform structural analysis using the methods of work and energy.
- Understand and evaluate the concepts of structural stability and determinacy.
- Understand and perform analysis of structures subject to live and moving loads using influence lines.
- Determine structural displacements due to applied forces, temperature changes, member distortions and support movements using virtual work and energy methods.
- Understand and perform the analysis of statically indeterminate structures using a flexibility (Force, compatibility) method.
- Understand and perform the analysis of statically indeterminate structures using a stiffness (Displacement, equilibrium) method.

#### RECOMMENDED TEXTBOOKS

- “*Structural Analysis*”, 10<sup>th</sup> edition by R.C. Hibbeler. [CarletonBookstore](#), [Amazon](#), [Publisher](#).
- “*An Introduction to Structural Analysis for Civil Engineers*”, by J. Erochko [free [online website](#)].

COURSE DELIVERY AND PEDAGOGY

*Lectures*

Lectures will take place during the official lecture times. Incomplete lecture slides (in PDF) will be posted on the day of or the day before each lecture. Annotated “full” lecture notes will be posted following the end of the lecture, however, attendance to the lectures is **HEAVILY** recommended as not everything will be jotted down on the posted slides.

*Laboratories / PA Sessions*

The laboratory sessions for this course are problem-solving sessions, and will be run by the teaching assistants (TAs). In each session, you will work through problems on the material currently being covered in class. Attendance is **HEAVILY** recommended and is a great way to reinforce what is learnt in the classroom.

*Drop-in Hours*

Drop-in hours (aka “office hours”) are specifically allocated by the instructor and TAs to make themselves available to you to ask questions and receive clarifications regarding course content. Remember: a 10-minute meeting with the instructor or TA can save you hours of hardship during the study period of your midterm and final exam. Also, we don’t bite...

*Assessments*

All exams will take place in-person, and all assignments will need to be handed in-person as physical copies.

COURSE OUTLINE (SUBJECT TO CHANGE)

WEEK	LECTURE DATE	TOPIC	LAB SESSION	TEXTBOOK CHAPTER
1	Sept. 13	Introduction to Structural Analysis	Lab 1	1
2	Sept. 20	Analysis of Statically Determinate Structures		2, 3
3	Sept. 27	Internal Forces and Shear/Bending Moment Diagrams 1	Lab 2	4
4	Oct. 4*	Internal Forces and Shear/Bending Moment Diagrams 2		4
5	Oct. 11	Virtual Work Method	Lab 3	9
6	Oct. 18	Deflections and Moment-Area Method		8, 9
7	Oct. 25	<b>Reading Week</b>		
8	Nov. 1	Conjugate Beam Method	<b>Midterm</b>	8
9	Nov. 8	Influence Lines 1		6
10	Nov. 15	Influence Lines 2	Lab 4	6
11	Nov. 22	Castigliano’s Theorem		9
12	Nov. 29	Force Method	Lab 5	10
13	Dec. 6	Slope-Deflection Method		11

\* October 4th lecture will be given asynchronously (video recording)

**COURSE WORK AND ASSESSMENT**

- Assignments**..... 15%
- Midterm** ..... 35%
- Final Exam** ..... 50%

*Assignments*

There will be a total of 4 assignments posted and due on the following dates:

Assignments	Posted Date	Due Date (at 4:00 pm)
Assignment 1	Sept. 28	Oct. 12
Assignment 2	Oct. 12	Oct. 21
Assignment 3	Nov. 2	Nov. 16
Assignment 4	Nov. 16	Nov. 30

Submission of the assignments will be done in person through the submission of physical assignments copies in the assignment box located in front of the Department of Civil & Environmental Engineering (Mackenzie Building, 3<sup>rd</sup> floor, 4<sup>th</sup> module). While it is permitted (and recommended) to discuss and work through the assignments with colleagues to enhance your personal understanding, it is crucial that assignments are completed individually. Attempting assignments individually is the only way to have an opportunity to test your understanding and practice for the midterm and the final exam.

As the first day of class, each student will be given two (2) “**class tokens**”. Each token allows for a one-time 24-hour extension of any assignment of their choosing **without penalty**. Tokens may be combined for a single assignment (i.e., 48-hour extension). Tokens may not be transferred to other students. All tokens expire at the end of the semester.

*Midterm Exam*

The midterm exam is scheduled to take place on **Friday, November 4<sup>th</sup> from 2:35 pm – 5:25 pm**. The midterm exam location is the same room as the laboratory room, Azrieli Theatre 102 (AT 102). The midterm will cover all the material from weeks 1 through 6, inclusively.

*Final Exam*

The final exam has not yet been scheduled. You will be notified of the date, time and location through the university once SES makes the exam schedule available.

*Appeals*

All appeals of marks assigned in this course must be made within **7 calendar days of the grade being made available**. Appeals of grade **can result in either a reduction or an increase** in grade.

*Graduate Attribute data collection*

The Canadian Engineering Accreditation Board (CEAB) requires the faculty to collect data on graduate attributes and use that data to improve our program. The aggregate data is used for accreditation purposes and to guide program improvements only and have no impact on individual student progression or evaluation. Data is collected in many courses across the faculty. The attribute being measured in this course relate to knowledgebase of fundamental engineering concepts.

## COURSE POLICIES

### *Academic Integrity:*

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensure that a degree from Carleton University is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. Carleton University's Policy on Academic Integrity (<http://www.carleton.ca/studentaffairs/academic-integrity>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. It is your responsibility to be familiar with these policies. Any students who do not act with academic integrity will face severe consequences including immediate referral to Associate Dean of Student Affairs.

### *Email Policy*

The professor is more than happy to answer questions related to administration via email. **For course content questions, please use the office hours.** Effort will be made to reply to emails as soon as possible, but please expect a possible delay of up to 48 hours for a response. Emails will not be answered during weekends or holidays.

For enquiries regarding assignments and problems seen during laboratory sessions, please contact the respective TA.

### *Absences*

In the interest of fairness for all students, requests for accommodating absences will only be granted for situations that are truly out of a student's control. Accommodations cannot be granted more than 48 hours after assignment deadlines. Notification of absence from a midterm cannot be accommodated more than 24 hours after the midterm end time.

If an absence from an evaluation is deemed justified:

- 1) Assignments: the weight of a justified missed assignment will be transferred onto the remaining assignments.
- 2) Midterm exam: you will need to write a makeup midterm exam. There will be only one make-up mid-term exam, with time and place to be announced following the schedule midterm exam.
- 3) Final exam: the student will have to consult the academic secretariat of the faculty for the procedure to follow.

### *Course Material Copyright*

Classroom teaching and learning activities, including lectures, discussions, presentations, etc., are copy protected and remain the intellectual property of the instructor. All course materials, including PowerPoint presentations, outlines, and other materials, are also protected by copyright and remain the intellectual property of the instructor. Students registered in the course may take notes and make copies of course materials for their own educational use only. Students are not permitted to reproduce or distribute lecture notes and course materials publicly for commercial or non-commercial purposes without express written consent from the copyright holder(s). Students are not permitted to upload these copyrighted course materials to any online repositories.

### *Classroom Behaviour*

Carleton University is committed to providing a living and learning environment that promotes student success inside and outside of the classroom. The Office of Student Affairs would like to remind all students that Carleton's conduct policies and students' rights and responsibilities also apply to online communication. Students are required to observe standards of behaviour expected in a university environment and in the profession of engineering. Please maintain a professional, respectful, attentive, and engaging classroom environment.

### *Academic Accommodation*

You may need special arrangements to meet your academic obligations during the term. For a comprehensive list of academic accommodation requests and their processes, please refer to the following [link](#). Please contact the course instructor if you would like to discuss your specific accommodations.

## STUDENT MENTAL HEALTH AND WELLNESS

Social isolation, career uncertainty, health concerns, and stresses of your studies can combine to create adverse mental health effects to students. These mental health effects and any feelings of anxiety and uncertainty are valid, and I strongly advise you to reach out and seek help and guidance when you feel it is necessary. There are [many resources](#) available to provide you with support and guidance through turbulent times, yet if you feel like you need to speak about it with me to guide you towards one of these resources, then please reach out! As a professor, my duty is not only to teach and evaluate learning, but to provide the best environment possible to facilitate the learning process, and that includes helping students get the support they need for success.

## **IMPORTANT**

### SPECIAL INFORMATION FOR PANDEMIC MEASURES

It is important to remember that COVID is still present in Ottawa. The situation can change at any time and the risks of new variants and outbreaks are very real. There are a number of actions you can take to lower your risk and the risk you pose to those around you including being vaccinated, wearing a mask, staying home when you're sick, washing your hands and maintaining proper respiratory and cough etiquette.

**If you are feeling sick, please stay home. If you require assistance from missing a lecture due to staying home, please contact a colleague, TA, or the course instructor. You will not be penalized for staying home if you are feeling unwell.** Remaining vigilant and not attending work or school when sick or with symptoms is critically important for the wellbeing of your peers and Carleton University staff. If you feel ill or exhibit symptoms while on campus or in class, please leave campus immediately. In all situations, you must follow [Carleton's symptom reporting protocols](#).

**In the event that the course instructor falls ill and/or tests positive for COVID-19 prior to a lecture, an announcement will be made on Brightspace and the in-person lecture will be canceled.** A recorded lecture will be posted on Brightspace shortly afterwards.

**Masks:** In light of the recent announcements from Ontario's Chief Medical Officer of Health and the evolving recommendations from Ottawa Public Health, **Carleton has paused its mandatory mask mandate as of June 25, 2022.** Even though masks will no longer be mandatory, we continue to strongly recommend and encourage masking when indoors, particularly if physical distancing cannot be maintained. It must be noted that it may become necessary for the University to bring back masking requirements on short notice if the situation and public health advice changes.

**Vaccines:** While proof of vaccination is no longer required as of May 1 2022 to attend campus or in-person activity, it may become necessary for the University to bring back proof of vaccination requirements on short notice if the situation and public health advice changes. Students are strongly encouraged to get a full course of vaccination, including booster doses as soon as they are eligible, and submit their booster dose information in [cuScreen](#) as soon as possible. Please note that Carleton cannot guarantee that it will be able to offer virtual or hybrid learning options for those who are unable to attend the campus.

All members of the Carleton community are required to follow requirements and guidelines regarding health and safety which may change from time to time. For the most recent information about Carleton's COVID-19 response and health and safety requirements please see the [University's COVID-19 website](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact [covidinfo@carleton.ca](mailto:covidinfo@carleton.ca)