Carleton University Department of Civil and Environmental Engineering

CIVE 4202A: WOOD ENGINEERING

Course Syllabus – Winter 2025

COURSE INSTRUCTOR

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Office Hours:
TBD (or by appointment)
See Brightspace for times

COURSE SCHEDULE

Lectures:
Tues/Thurs 10:05am-11:25am
Tutorials: ODD WEEKS ONLY
Mon 2:35pm-5:25pm
Term Tests:
Thurs. Feb 3 within 2:35pm-5:25pm
Thurs. Mar 10 within 2:35pm-5:25pm
Asynchronous Lecture Content:
Available on YouTube (unlisted)
Links provided on Brightspace

COURSE WEBSITE AND COMMUNICATION

All course information and online quizzes 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.

COURSE DESCRIPTION AND OBJECTIVES

Calendar Description: Structural design in timber. Properties, anatomy of wood, wood products, factors affecting strength and behaviour, strength evaluation and testing. Design of columns, beams and beam-columns. Design of trusses, frames, glulam structures, plywood components, formwork, foundations, connections and connectors. Inspection, maintenance and repair.

In CIVE4202, students will learn how to design wood/timber structures and will learn about the behaviour, deterioration and protection of wood as a structural material.

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

- Explain the behaviour of wood as a structural material, including shrinkage, creep and the effects of moisture and treatment.
- Identify and describe maintenance and repair problems for wood structures.
- Apply National Building Code of Canada (NBCC) loads and load combinations for the design of wood structures.
- Design sawn lumber and glulam structural elements including beams, columns, and beam-columns.
- Design connections for wood elements using nails, screws, bolts

- Create and annotate drawings of timber structures and connections.
- Summarize and explain the fire protection measures for wood structures

TEXTBOOK

It is mandatory that all students own a **paper** copy of the 2020 Wood Design Manual. This book is not available at the university bookstore. You must get a copy on your own directly from the Canadian Wood Council (CWC). Please order this book as soon as possible because it takes some time to ship, and you need it for in-class tests. It comes in two volumes, you need both, but they only come as a set. The manual costs $275 plus tax; however, the CWC offers a 40% discount for students, making the final cost approximately $165 plus tax. Follow these instructions to get the discount (also found at https://webstore.cwc.ca/student-promotion/):

1. Register to create an account or sign in at webstore.cwc.ca
2. Place your order online
3. Enter Promo Code "Student" in the Promotion/Coupon field
4. Finalize your order
5. Attach an image of the front and back of your student card or other proof of enrollment (alternately, can email proof to orders@cwc.ca)

A second-hand copy is fine, but it should be the 2020 edition of the manual.

COURSE OUTLINE (TOPIC AND DUE DATES SUBJECT TO CHANGE)

WK		DATE	TOPIC
1	Tutorial 0	Jan. 6	CANCELLED
	Lectures 1/2	Jan. 7/9	Introduction to wood engineering and construction,
2	Lecture 3/4	Jan. 14/15	Wood strength and modification factors and grading
3	Tutorial 1	Jan 20	Problem Analysis / Take-up / Questions
	Lecture 5/6	Jan. 21/23	Limit states design, load combinations and deflection limits, design for tension, design for compression parallel to grain
4	Lecture 7/8	Jan. 28/30	Design of built-up columns, design for compression perpendicular to grain (bearing) **PROJECT PART 1 DUE**
5	Tutorial 2	Feb. 3	**TERM TEST 1**
	Lecture 9/10	Feb. 4/6	Design of bending members and design for deflection
6	Lecture 11/12	Feb. 11/13	Design for shear **PROJECT PART 2 DUE**
			WINTER BREAK FEBRUARY 17 TO 21
7	Tutorial 3	Feb. 24	Problem Analysis / Take-up / Questions
	Lecture 13/14	Feb. 25/27	Design for combined compression and bending (beam-columns)
8	Lecture 15/16	Mar. 4/6	Introduction to Connections. Connection design guidelines. **PROJECT PART 3 DUE**
9	Tutorial 4	Mar. 10	**TERM TEST 2**
	Lecture 17/18	Mar. 11/13	Design of nailed connections
10	Lecture 19/20	Mar. 18/20	Design of nailed and bolted connections
11	Tutorial 5	Mar. 24	Problem Analysis / Take-up / Questions
	Lecture 21/22	Mar. 25/27	Design of bolted connections **PROJECT PART 4 DUE**
12	Lecture 23/24	Apr. 1/3	Connection Examples
13	Tutorial 6	Apr. 7	Problem Analysis / Take-up / Questions
	Lecture 25	Apr. 8	Introduction to lateral load design and design of concrete formwork. Introduction to cross-laminated timber (CLT) walls. Exam Review **PROJECT PART 5 DUE**

COURSE WORK AND ASSESSMENT

Pre-Lecture Surveys..... Not graded
Weekly Assignments ..... Not graded
In-Lecture Assignments..... Not graded
Project..... 20% (divided into five parts)
Term Tests..... 40% (20% each)
Final Exam..... 40%

Pre-Lecture Surveys

Before each week of lectures, each student has the opportunity to submit questions or feedback about the content and delivery through an online survey. The instructor reads all of these comments every week. In order to use the comments and questions to prepare for the upcoming week's lecture, students must submit the question **prior to 11:59pm on Sunday** (typically).

In-Lecture Assignments

Occasionally, short active learning assignments will be conducted during synchronous lectures or tutorials. Not every lecture will necessarily have an in-lecture assignment. These assignments are not for credit.

Project

A term-long project will be divided into five parts, with different submission dates as shown (tentatively) on the course outline. The project will be the design or retrofit of a wood frame structure. More details will follow. Students are expected to typeset calculations for the project using MathCad (free version) or an equivalent software. This mirrors practice in industry for production of presentation calculations for peer review.

Late project submissions will be accepted for 24 hours with a 10% penalty. Late submissions past 24 hours will not be accepted unless previous accommodation arrangements have been made with the instructor (previous to the due date).

Term Tests

There will be two term tests. They will be delivered during the scheduled tutorial periods on Thurs. Feb. 3 and Thurs. March 10.

Students will be permitted to use the wood design manual and a non-programmable calculator during the term tests.

Only circumstances which are truly outside of a student's control will be accepted as valid reasons to miss the test.

Students are required to submit a Declaration of Absence form within 48 hours of missing a term test. The instructor will determine if the absence is reasonable. Failure to submit the Declaration of Absence form by the deadline will result in a grade of zero which will be counted towards the final mark.

A make up tests or project may also be assigned at the instructor's discretion for students who miss a term test due to a valid reason.

Final Examination

The final exam has not yet been scheduled. Students will be permitted to use the wood design manual and a non-programmable calculator during the final exam.

A minimum mark of 40% on the final exam is required to pass the course.

Final exams are for evaluation purposes and will not be returned to students.

Deferred Final Examinations: Students who are unable to write the final examination because of a serious illness/emergency or other circumstance beyond their control may apply for accommodation by contacting the Registrar's office. Consult the Section 4.3 of the University Calendar.

Appeals

All appeals of marks assigned in this course must be made within 10 days of the posting date.

COURSE POLICIES

Academic Dates

Students should be aware of the academic dates (eg. last day for academic withdrawal) posted on the Registrar's office web site https://carleton.ca/registrar/registration/dates/academic-dates/

Academic Integrity and Plagiarism:

Please consult the Faculty of Engineering and Design information page about the Academic Integrity policy and our procedures: https://carleton.ca/engineering-design/current-students/fed-academic-integrity Violations of the Academic Integrity Policy will result in the assignment of a penalty such as reduced grades, the assignment of an F in a course, a suspension or, expulsion.

One of the main objectives of the Academic Integrity Policy is to ensure that **the work you submit is your own.** As a result, it is important to write your own solutions when studying and preparing with other students and to avoid plagiarism in your submissions. The University Academic Integrity Policy defines plagiarism as "presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one's own." This includes reproducing or paraphrasing portions of someone else's published or unpublished material, regardless of the source, and presenting these as one's own without proper citation or reference to the original source.

Examples of violations of the policy include, but are not limited to:

- any submission prepared in whole or in part, by someone else;
- using another's data or research findings without appropriate acknowledgement;
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one's own; and
- failing to acknowledge sources of information through the use of proper citations when using another's work and/or failing to use quotations marks.

AI / ChatGPT / Generative AI Policy:

The use of Artificial Intelligence (AI) tools (e.g. ChatGPT, Claude, Gemini, etc.) is not permitted in this course.

Email Policy

The instructor is more than happy to answer questions related to course content or administration via email. 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. In addition, complex technical questions should be addressed in tutorial, during office hours, or by appointment. Emails must come from official Carleton University email addresses or through Brightspace. The instructor will not respond to emails from outside addresses.

Extensions and Rewrites

In the interest of fairness for all students, requests for rewrites will only be granted for situations that are truly out of a student's control.

Course Material Copyright

The materials (including the course outline, slides, posted notes, videos, labs, projects, assignments, quizzes, exams, and solutions) created for this course are intended for personal use only. They may not be reproduced, redistributed, or transmitted in any form or by any means—electronic, mechanical, photocopying, recording, or otherwise—without written permission from the author(s), both during and after the semester.

Learning and Working Environment

The University and all members of the University community share responsibility for ensuring that the University's educational, work and living environments are free from discrimination and harassment. Should you have concerns about harassment or discrimination relating to your age, ancestry, citizenship, colour, creed (religion), disability, ethnic origin, family status, gender expression, gender identity, marital status, place of origin, race, sex (including pregnancy), or sexual orientation, please contact the Department of Equity and Inclusive Communities at equity@carleton.ca

We will strive to create an environment of mutual respect for all through equity, diversity, and inclusion within this course. The space which we work in will be safe for everyone. Please be considerate of everyone's personal beliefs, choices, and opinions.

Academic Accommodation

Students with diverse learning styles and needs are welcome in this course.

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Academic Accommodations for Students with Disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders

(ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at **613-520-6608** or pmc@carleton.ca.

You should request your academic accommodations in the Ventus Student Portal, for each course at the beginning of every term. For in-term tests or midterms, please request accommodations at least two (2) weeks before the first test or midterm. For final exams, the deadlines to request accommodations are published in the University academic calendars for both undergraduate and graduate students.

Accommodation for Student Activities: Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see the Senate Policy on Accommodation for Student Activities (PDF).

Pregnancy Obligation: Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, please review the Student Guide to Academic Accommodation (PDF).

Religious Obligation: Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, please review the Student Guide to Academic Accommodation (PDF).

Survivors of Sexual Violence: As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit the Sexual Violence Prevention & Survivor Support.

Engineering Academic Advising

The Engineering Academic Support Service assists undergraduate engineering students with course selection, registration, and learning support from first-year through to graduation.

Academic Advisors Contact can be found here: https://carleton.ca/engineering-design/current-students/undergrad-academic-support/undergraduate-advisors/

Student Mental Health and Wellness

As a university student you may experience a range of mental health challenges that can significantly impact your academic success and overall well-being. Carleton's Wellness Services Navigator is designed to help students connect with mental health and wellness resources.

If you need to talk to someone from the department for more information and support with connecting to resources, you can contact the following faculty members, depending on your program. Or contact the department at or CEEUGChair@cunet.carleton.ca.

ACSE: Prof. Elie Azar
Email: Elie.Azar@carleton.ca, Office: 3432 Mackenzie

CIVE: Prof. Heng Khoo
Email: heng.khoo@carleton.ca, Office: 3364 Mackenzie

ENVE: Prof. Shoeleh Shams
Email: shoelehshams@cunet.carleton.ca, Office: 4242 Mackenzie

Here is a list of on-campus and off-campus recourses:

1. **Carleton's Wellness Desk:** Located at 204A MacOdrum Library, is a space for students to learn about resources, connect with our Wellness Coordinator, and decompress during stressful times of the year. You can pop into the Wellness Desk any time during its hours of operation – no appointments necessary! https://wellness.carleton.ca/mental-health/wellness-desk/

2. **Carleton's Health and Counselling Services:** To book an appointment contact the main clinic by calling (613) 520-6674. If urgent, let the Patient Care Coordinator know or go in person to the main clinic (2500 Carleton Technology and Training Centre Building) and indicate that they are in crisis and need to speak to someone right away. For more information, please see https://carleton.ca/health/

3. **Residence Counselling and Wellness Service**: Counselling services specifically for students in residence. https://carleton.ca/health/residence-counselling/

4. **Therapy Dogs**: Carleton's therapy dogs are around campus with their owners (who are Carleton University staff and faculty) to comfort and provide support to help you thrive as a university student. https://carleton.ca/wellness/dogs/

5. Emergencies and Crisis and Emergency Numbers

6. **Good2Talk (1-866-925-5454):** Good2Talk is a free, confidential helpline providing professional counselling and information and referrals for mental health, addictions and well-being to post-secondary students in Ontario, 24/7/36 https://good2talk.ca/

7. **Empower Me:** Undergraduate students have access to free counselling services in the community through Empower Me, either in person, by telephone, video-counselling or e-counselling. **This free service is accessible 24/7, 365 days per year.** Call **1-844-741-6389 (toll free)** to make an appointment with a counsellor in the community. More information is available https://students.carleton.ca/services/empower-me-counselling-services/

8. **The Walk-In Counselling Clinic (off-campus community resource):** The walk-in Counselling Clinic have offices in various locations across Ottawa and the greater Champlain region that are open 7 days a week. Individuals will be assisted, with no appointment, on a first-come, first-serve basis during the Walk-in Counselling Clinic hours. The Walk-in Counselling Clinic **offers services in many languages** and is free and confidential. More information can be found at: https://walkincounselling.com/

9. **Distress Centre of Ottawa and Region**: Available 10am-11pm, 7 days/week, 365 days/year. **Distress Line:** 613-238-3311, **Crisis Line:** 613-722-6914 or 1-866-996-0991, **Text:** 343-306-5550. https://www.dcottawa.on.ca/

10. **Distress and Crisis Ontario**, Available for chat 2 pm – 2 am EST. https://www.dcontario.org/

11. **BounceBack Ontario (Toll-Free: 1-866-345-0224)** is a free skill-building program managed by the Canadian Mental Health Association (CMHA). It is designed to help adults and youth 15+ manage low mood, mild to moderate depression and anxiety, stress or worry. Delivered over the phone with a coach and through online videos, you will get access to tools that will support you on your path to mental wellness. https://bouncebackontario.ca/.