

Carleton University Department of Civil and Environmental Engineering
ECOR 1046: MECHANICS
Course Syllabus – 2024 (Winter)

COURSE INSTRUCTORS and TEACHING ASSISTANTS

Section D & F

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Department of Civil and Environmental Engineering

Office Hour: flexible appointments. Send me an email with ALL your availabilities in the next 7 days.

Section E

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Department of Civil and Environmental Engineering

Office Hour: Tuesdays 10:30am – 11:30pm & 1:00 – 2:00pm

TA information will be posted on Brightspace

COURSE WEBSITE AND COMMUNICATION

All course information 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

This course introduces principles of mechanics for engineering structures. Learning mechanics will provide you with important problem-solving concepts and skills that are transferable to many subjects in your program of study. In this course, you will learn the basic applications of the science of physics to the profession of engineering. Mathematics also plays an important role in this course and here you will use basic concepts and skills in algebra, trigonometry, vectors, and calculus to solve engineering statics problems. To develop the skills required for this course you have to practice and participate in lectures, problem analysis (PA) sessions, and other course elements.

LEARNING OUTCOMES

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

- Analyze the equilibrium conditions of 2D particles and rigid bodies when solving 2D truss problems;
- Determine axial force, shear force, and moment (A, V, M) at a point for beams and frame elements;
- Determine shear and moment diagrams for beam elements;
- Understand and apply the basic structural engineering design process; and,
- Understand how to approach solving engineering problems.

COURSE DELIVERY

This course will be delivered fully in-person, this class is not catered towards online students or students who cannot access campus. Lecture slides from the lecture will be posted the day of the lecture. Office hours will be held in which you will have the opportunity to ask any further questions. All assessments will be in-person.

COURSE COMMUNICATION

We will be using the announcement function in Brightspace to send out any updates with important information related to the course. Using the announcement function is helpful because it keeps all communication from me about this course in one place instead of searching through your email every time you need to find a previous communication.

TEXTBOOK

Engineering Mechanics – Statics and Dynamics” 14th edition by R.C. Hibbler.

COURSE OUTLINE (SUBJECT TO CHANGE)

WEEK	DATE	LECTURE	TOPIC	TEXTBOOK CHAPTER
1	Oct 31	Lect. #1	Trusses Analysis I	Ch 6
	Nov 2	Lect. #2	Trusses Analysis II	Ch 6
2	Nov 7	Lect. #3	Trusses Analysis III	Ch 6
	Nov 9	Lect. #4	2D Frames and Machines	Ch 6
3	Nov 14	Lect. #5	Internal Forces in 2D Beam and frames I	Ch 7
	Nov 16	Lect. #6	Internal Forces in 2D Beam and frames II	Ch 7
4	Nov 21	Lect. #7	Internal Forces in 2D Beam and frames III	Ch 7
	Nov 23	Lect. #8	Normal and Shear Stress	Ch 1*
5	Nov 28	Lect. #9	Normal and Shear Strain	Ch 2*
	Nov 30	Lect. #10	Shear and Moment Diagrams for Beams I	Ch 7
6	Dec 5	Lect. #11	Shear and Moment Diagrams for Beams II	Ch 7
	Dec 7	Lect. #12	Shear and Moment Diagrams for Beams III	Ch 7

* Mechanics of Materials, 10th Edition, R.C. Hibbeler

COURSE WORK AND ASSESSMENT

Group Project 10% (2 Group Submissions + 2 Individual Submissions)

Midterm Exam 40%

Final Exam 50%

Project

The course project will have 2 total Submissions. A full description of the project, project deadlines, in addition to the rubrics for grading the deliverables will be posted on Brightspace.

Midterm Exam

Midterm exam will be scheduled on **Saturday, March 23rd, 9:30am – 10:30am**. The Midterm location will be posted on Brightspace. Midterm exam is a closed book, in-person exam, you are not allowed to bring any notes, formula sheet provided.

Final Exam

Final exam is a closed book, in-person, 2 hour exam, you are not allowed to bring any notes. 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 7 calendar days of the grade being made available. Appeals of grade can result in either a reduction or an increase in grade.

Academic dates

Students should be aware of the academic dates (eg. last day for academic withdrawal and examination period) posted on the Registrar's office web site

<https://carleton.ca/registrar/registration/dates/academic-dates/>

COURSE POLICIES

Email Policy

The instructor 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 (especially during weekends). Emails must come from official Carleton University email addresses or through Brightspace. The instructor will not respond to emails from external addresses.

Missed term work

Students who claim illness, injury or other extraordinary circumstances beyond their control as a reason for missed term work are held responsible for immediately informing the instructor concerned and for making alternate arrangements with the instructor and in all cases, this must occur no later than three (3) calendar days after the term work was due. The alternate arrangement must be made before the last day of classes in the term as published in the academic schedule. Consult [Section 4.4 of the University Calendar](#). There is no makeup or deferred midterm for this course.

GRADUATE ATTRIBUTES AND ACCREDITATION UNITS

The Canadian Engineering Accreditation Board (CEAB) requires graduates of undergraduate engineering programs to possess 12 attributes. Courses in all four years of our programs evaluate students' progress towards acquiring these attributes. Aggregate data (typically, the data collected in all sections of a course during an academic year) is used for accreditation purposes and to guide improvements to our programs. Some of the assessments used to measure GAs may also contribute to final grades; however, the GA measurements for individual students are not used to determine the student's year-to-year progression through the program or eligibility to graduate. This following list provides the GAs that will be measured in this course, along with the Learning Outcomes that are intended to develop abilities related to these attributes. For information on GAs and continual curriculum improvement, visit the [Accreditation section of Engineers Canada website](#).

GA - Indicator	Assessment Tool
1.3 – Fundamental Engineering Concepts	Overall course grade
4.1,4.2,4.4,4.5,4.6,4.7 – Engineering Design	Group Project rubrics
6.1,6.2,6.3 – Individual and teamwork	Peer feedback survey

Math	Natural Science	Complementary Studies	Engineering Science	Engineering Design
	25%		75%	

ACADEMIC INTEGRITY AND PLAGIARISM

- a) 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.
- b) 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.

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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](mailto:equity@carleton.ca) at equity@carleton.ca

ACADEMIC ACCOMMODATIONS

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. Please consult the [PMC website](#) for the deadline to request accommodations for the formally-scheduled exam (if applicable).

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.

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

1. **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/>

2. [Emergencies and Crisis](#) and [Emergency Numbers](#)
3. **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/>
4. **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/>
5. **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/>
6. **[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/>
7. **[Distress and Crisis Ontario](#)**, Available for chat 2 pm – 2 am EST. <https://www.dcontario.org/>
8. **[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/>.