

CARLETON UNIVERSITY
Department of Civil and Environmental Engineering
CIVE2101 - Engineering Mechanics (Winter 2022)

Instructor: Abhijit Sarkar Office: 3076 MC
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Office Hours: TBA

Teaching Assistants: TBA

Web: Brightspace

Some course materials, announcements, etc. may be posted on the course web page in cuLearn. It is highly recommended that students visit this page as often as possible for the latest updates.

Textbook (Required):

Engineering Mechanics – Statics and Dynamics, 14th Edition, R.C. Hibbeler.

Tentative Lecture Schedule

Week	Lecture	Topic
1	1	Force Systems, Equilibrium: Particles & Bodies
	2	Friction: Introduction & Basic Problems
2	3	Friction: Wedges
	4	Friction: Threads/Screws
3	5	Friction: Bearings/Clutches
	6	Friction: Belt Friction
4	7	Virtual Work: Particles & Rigid Body
	8	Virtual Work & Potential energy
5	9	Review: Particle Kinematics
	10	Review: Particle Kinetics
6	11	Review: Energy & Momentum
	12	Planar Kinematics: Translation & Rotation
7	13	General motion: Velocities
	14	Instantaneous centre
8	15	General motion: Acceleration
	16	Sliding contacts (Absolute motion analysis)
9	17	Moving Reference Frames (Rotating Axes)
	18	Moment of Inertia
10	19	Planar Kinetics: Equations of motion
	20	Planar Kinetics: Rotation about a fixed axis
11	21	Planar Kinetics: General Plane motion
	22	Work & Energy
12	23	Impulse and Momentum
	24	Impacts

Student Learning Outcomes:

At the end of this course, students will be able to:

- Understand and solve basic problems in friction.
- Understand and solve problems in wedges, threads, clutches and belt friction.
- Apply the principle of virtual work and potential energy in solving problems in statics.
- Understand and solve problems in kinematics of rigid bodies in two dimensions.

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Marking Scheme:

Two (2) Tests/Exams (Each 17.5%, Total 35%,): All topics covered until the end of the week before the tests will be included. Missing any test will automatically result in a mark of zero for that component unless acceptable documentation is presented to justify your absence within three days of the date of the test. The instructor will decide what documentations are acceptable. You must obtain approval prior to the test(s) if you cannot write the test(s) at the scheduled time(s) (except in cases of unexpected emergencies). If unsure of what would be proper documentation for the given circumstances, please consult with your instructor. If you miss any test and present acceptable documentations, the percentage/weight of the test will be added to the next test (if a student misses the first test) or a make-up test (if a student misses the second test). There will be only one make-up test, time and place to be announced. All topics covered until the end of the week before the test will be included.

Tentative Schedule: February 1 and March 15; the tests will be conducted during your PA session.

Final Exam (65%): Maximum 3 hours. Date and time determined by the university. A minimum mark of 30% in term-work (two tests), 30% in the final exam, and 50% of the total mark (two tests + final exam) is required to pass this course.

Notes:

- * The course will be delivered in synchronous mode via web conferencing tools at scheduled times.
- * Use of e-Proctoring system: This course has timed written assessments, which may consist of tests, midterms and/or final examinations. The Carleton University e-Proctoring system may be used in your assessments, and requires the use of webcams, microphones, and smart phones.
- * The instructor may modify the outline during the term as the course progresses.
- * Attendance to all tests/exams and PA/Labs are mandatory.
- * The final exam is for evaluation purposes only, and the paper will not be returned or made available to students by the instructors after it is marked.
- * All grade appeals in this course must be made within seven days of the posting or return of the graded component. Appeals are to be addressed to the marking TA first.
- * Academic integrity is essential to the pursuit of learning and scholarship in a university. As a result, the University treats cases of cheating and plagiarism very seriously. Carleton University's Policy on Academic Integrity (<http://www.carleton.ca/registrar/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.
- * Students will be assigned a grade of Failure if they failed to achieve a mark of less than 30% on the term work, regardless of the mark on the final exam.
- * **Copyright on Materials:** The materials created for this course are intended for personal use and may not be reproduced, redistributed, or posted on any website without prior written permission from the author(s).
- * **Graduate Attributes:** 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.
- * **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. For more information, please consult: <http://students.carleton.ca/course-outline>

Pregnancy Obligation: Please contact the instructor with any requests for academic accommo-

dation 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 consult: <http://students.carleton.ca/course-outline>.

Religious Obligation: Please contact the 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 consult: <http://students.carleton.ca/course-outline>.

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 for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your **Letter of Accommodation** at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). **Requests made within two weeks will be reviewed on a case-by-case basis.** After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (<http://www.carleton.ca/pmc>) for the deadline to request accommodations for the formally-scheduled exam (if applicable).

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 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, please visit: <http://www.carleton.ca/sexual-violence-support>.

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 the 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 information, please consult: <http://students.carleton.ca/course-outline>.