

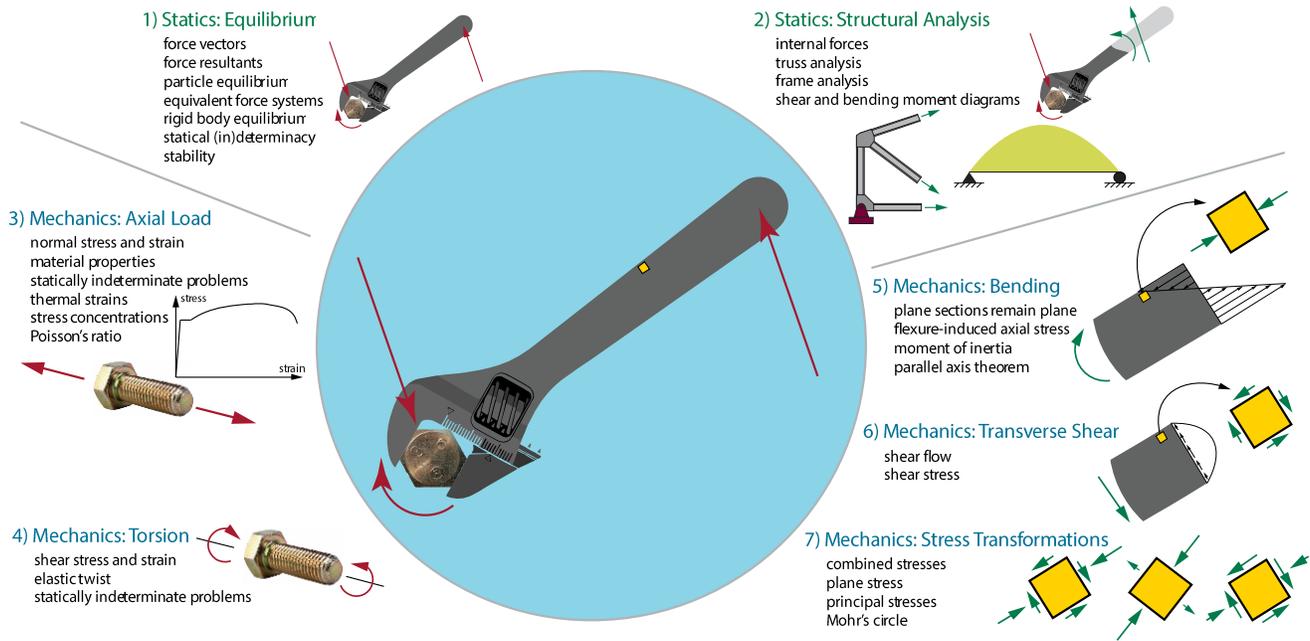
COURSE INFORMATION

Course Name:	Statics and Mechanics of Materials	Course Code: CIV ENG 2P04
Session Offered:	Fall 2020	
Calendar Description:	Principles of statics as applied to rigid bodies. Internal forces, shear and bending moment diagrams, Stress and strain, elastic behaviour of simple members under axial force, torsion, bending and traverse shear. Principal stresses.	
Pre-Requisites:	Physics 1D03 and registration in Level II or above of Civil Engineering program	
Instructor:	Dr. Lydell Wiebe (wiebel@mcmaster.ca , JHE 333, 905-525-9140 x24620)	
Teaching Assistants:	Saleh Ahmadi Soleimani (ahmadiss@mcmaster.ca) Oscar Camarillo (camarilo@mcmaster.ca) Phil Reinders (reinderp@mcmaster.ca)	
Lectures:	Tuesdays, Thursdays, and Fridays 11:30-12:20 via Zoom (see instructions on course website)	
Tutorials:	Mondays 3:30-5:20 pm via Zoom (see instructions on course website)	
	<i>Lectures and tutorials will be recorded and posted on the password-secured course website. You are under no obligation to appear or speak in the recording. If you choose to participate in an identifiable way, you are consenting to the recording being used as noted above.</i>	
Website:	On Avenue to Learn (http://avenue.mcmaster.ca). Please sign up immediately because important information and course documents will be posted there. It is your responsibility to check the course website regularly.	
Email:	The general email address for this course is CE2P04@mcmaster.ca. You can expect a response from TAs within 1 business day, or from the instructor within 3 business days.	
TA Office Hours:	Fridays 1:30-2:30 pm via Zoom – This is best for specific questions related to the next assignment.	
Instructor Office Hours:	Thursdays 1:30-2:30 pm via Zoom – This is best for general questions related to course concepts that could not be adequately addressed during lecture or tutorial.	
Accommodations:	In keeping with university policy (see Section 7), I am happy to work with you to arrange accommodations that may be needed to help you achieve your learning goals for this course. Please do not be afraid to reach out to discuss your unique circumstances.	

1. COURSE OBJECTIVES

Please refer to Section 5 for the Learning Outcomes of this course. As shown in the graphical outline on the next page, the first section of this course will focus on fundamentals of statics, including equivalent force systems, equilibrium in two dimensions, internal forces, truss solution techniques, and shear and bending moment diagrams.

The second section of the course will be devoted to mechanics of materials, including fundamentals of stress and strain, response of members to axial, torsion, bending, and transverse shear. We will conclude with an introduction to stress transformations.



2. COURSE SPECIFIC POLICIES

My goal in every class is to provide the best possible environment for everyone in the class to become competent structural engineering professionals. Online meetings can make it easier to forget or ignore expectations for interacting with others that we would follow during class. To promote the best possible learning environment, please remember to:

- **Speak (write) with respect.** Do not say or write something online that would be inappropriate to say in person.
- **Show with respect.** If you choose to turn on your video or share your screen, ensure that the video does not show anything that would be inappropriate to show in person. Dress in a way that would be acceptable for an in-person class, and do not show anything (e.g. your background) that would be considered offensive.
- **Be prepared to work.** Check the course website before coming and expect to participate actively in every class, including have a calculator with you.
- **Participate in class like you would in person.** Do not try to multi-task.

If you are disrupting the class, I may need to remove you from the session, potentially without warning. I may also need to meet with you and the Chair of the Department.

If you are bothered by the behaviour of other students, please let me know so that I can address your concerns.

Very Highly Recommended Book (see Section 4):

Hibbeler RC. 2017. Statics and Mechanics of Materials, 5th Ed. Pearson Education.

COURSE OUTLINE

Extreme Circumstances and Other Modifications

In accordance with McMaster Policy as noted in Section 7, the instructor may adjust the lecture and assessment schedule during the term. If this happens, the class will be given reasonable notice, an explanation, and an opportunity to comment, although the instructor will not necessarily make changes in response to comments received. It is your responsibility to stay informed of changes by attending all lectures and by checking the course website regularly.

Academic Integrity

As an example of the Academic Integrity Policy (Section 7), most problem set questions in this course will have a single correct answer. Discussing your solution technique with your classmates is encouraged, but copying some or all of the solution from another student is considered an example of academic dishonesty. Quizzes and the final exam are expected to be completed independently; both receiving and giving information regarding these assessments before all students have completed them are considered examples of academic dishonesty. **You will be required to include a cover sheet attesting to your integrity for everything you wish to receive credit for in this course.**

Equity, Diversity, and Inclusion

In keeping with the Anti-Discrimination Policy (Section 7), I want to note that you have a right to an environment that is free of discrimination and harassment. If you have any concerns, please do not hesitate to contact me or a human rights officer (equity.mcmaster.ca). Like many people, I am still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone, including me) that made you feel uncomfortable, it is always an option to speak to me about it or to send anonymous feedback.

3. APPROXIMATE SCHEDULE

Week	Lecture Topics (subject to change without notice)
1. Sep 7	Statics: Force Vectors at a Point
2. Sep 14	Statics: Forces on 2D Rigid Bodies
3. Sep 21	Statics: Statical Determinacy; Introduction to Trusses
4. Sep 28	Statics: Structural Analysis of Trusses and Frames
5. Oct 5	Statics: Structural Analysis of Beams: Shear and Bending Moment Diagrams
Oct 12	Midterm Recess: No Lectures or Tutorial
6. Oct 19	Mechanics of Materials: Stress & Strain; Behaviour under Axial Load
7. Oct 26	Mechanics of Materials: Axial Deformations
8. Nov 2	Mechanics of Materials: Torsion
9. Nov 9	Mechanics of Materials: Bending
10. Nov 16	Mechanics of Materials: Transverse Shear
11. Nov 23	Mechanics of Materials: Combined Loading
12. Nov 30	Mechanics of Materials: Stress Transformations
13. Dec 7	Course Wrap-Up
FINAL EXAMINATION	Scheduled during the regular University Final Examination period established by the Registrar's Office

COURSE OUTLINE

4. ASSESSMENT OF LEARNING	WEIGHT
<p>Required Components:</p> <p>Final Exam (to be scheduled by the Registrar's Office) This will be a cumulative synchronous exam, to be scheduled by the Registrar's Office. The weight of the exam can be reduced by completed Problem Sets, as described below.</p> <p>Weekly Quizzes (second hour of tutorial) There will be a quiz during the second hour of tutorial each week. Quizzes are cumulative, but with a focus on new material. Only your best 10 quizzes will count.</p>	<p>up to 60%</p> <p>10 x (up to 4%) = up to 40%</p>
<p>Optional Components to Increase Grade:</p> <p>Problem Sets (optional) There will be one problem set every week, due at the start of tutorial and taken up by the TA during tutorial. The problem sets will normally be assigned from the textbook, so you will need access to the textbook if you wish to complete the problem sets. For each problem set where your grade is higher than your final exam score, that problem set will count for 1.5% of your final grade and will reduce your final exam grade by the same amount. <i>Example:</i> You submit only the first 2 problem sets, scoring 90% on the first and 50% on the second. You score 60% on the final exam. In this case, the problem set where you scored 90% will be worth 1.5% of your final grade, the problem set where you scored 50% will not be included in your grade, and your final exam will be worth 58.5% of your final grade.</p> <p>Participation (optional) Several poll questions will be asked during every lecture, with a limited time for you to respond. Each lecture where you answer every poll will count as "attended," regardless of whether your answers are correct. The percentage of lectures "attended" will be multiplied by 10% to produce your participation grade, and the weight of the weekly quizzes will be reduced by the same amount. <i>Example:</i> You connect for every lecture, but due to internet problems, you sometimes can't answer all the polls in time. You end up qualifying as having "attended" 80% of lectures. In this case, your participation grade will be 8% and your weekly quizzes will be worth 32% of your grade (3.2% per quiz that counts).</p>	<p>up to 12 x 1.5% = up to 18%</p> <p>up to 10%</p>
<p>Notes:</p> <ol style="list-style-type: none"> Late submissions: Because of the number of items that can be omitted from your grade and the desire to provide feedback as quickly as possible, no late submissions will be accepted for any part of this course. Discussions of Feedback: You are encouraged to discuss the feedback that you receive on any assessment with your TAs or the course instructor. If you believe that you have received an incorrect grade on any piece of assessment, you must return it to the person who marked it, together with a written explanation of why you believe the grade was incorrect, within one week of the day that the assessment was returned. This may result in the grade increasing, decreasing, or remaining the same. MSAFs: <i>In the event of an absence for medical or other reasons, students should review and follow the regulations regarding Requests for Relief for Missed Academic Term Work.</i> However, because the lowest quiz and problem set scores will already not contribute to your grade, submitting an MSAF will not normally result in any further accommodations or adjustments to the way that your grade is calculated. 	

5. LEARNING OUTCOMES

When you have successfully completed this course, you will have increased your knowledge base for engineering so that you will be able to:

- draw and label free body diagrams of physical problems [CEAB Indicator 1.2]
- apply the equations of static equilibrium to calculate resultant and reaction force vectors [1.1, 1.2]
- distinguish statical determinacy and indeterminacy [3.1]
- calculate and express the forces within members of a statically determinate truss under load [1.2]
- calculate and express the forces within a bending member under load [1.1, 1.2]
- define terms related to stress, strain, and stress-strain relationships [1.2]
- calculate the stresses, strains, and deformations within members under axial load, shear force, flexure, and torsion [1.1, 1.2]
- calculate the deformations and forces within simple statically indeterminate structures [1.2, 3.1]
- transform stresses on elements of plane stress [1.2, 3.1]

Graduate Attributes and CEAB Indicators

Through this course, you will develop in the following graduate attributes and indicators:

1. A knowledge base for engineering (Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.)
 - 1.1 Competence in Mathematics
 - 1.2 Competence in Natural Sciences
3. Investigation (An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data, and synthesis of information in order to reach valid conclusions.)
 - 3.1 Able to recognize and discuss applicable theory knowledge base

6. COMMUNICATIONS

It is the student's responsibility to:

- Maintain current contact information with the University, including address, phone numbers, and emergency contact information.
- Use the University provided e-mail address or maintain a valid forwarding e-mail address.
- Regularly check the official University communications channels. Official University communications are considered received if sent by postal mail, by fax, or by e-mail to the student's designated primary e-mail account via their "@mcmaster.ca" alias.
- Accept that forwarded e-mails may be lost and that e-mail is considered received if sent via the student's @mcmaster.ca alias.
- Check the McMaster/Avenue email and course websites on a regular basis during the term.

7. POLICIES

ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. **It is your responsibility to understand what constitutes academic dishonesty.**

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the [Academic Integrity Policy](https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/), located at <https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/>.

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

AUTHENTICITY / PLAGIARISM DETECTION

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to www.mcmaster.ca/academicintegrity.

COURSES WITH AN ON-LINE ELEMENT

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

ONLINE PROCTORING

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

CONDUCT EXPECTATIONS

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the [Code of Student Rights & Responsibilities](#) (the “Code”). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online**.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students’ access to these platforms.

ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES

Students with disabilities who require academic accommodation must contact [Student Accessibility Services](#) (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University’s [Academic Accommodation of Students with Disabilities](#) policy.

REQUESTS FOR RELIEF FOR MISSED ACADEMIC TERM WORK

[McMaster Student Absence Form \(MSAF\)](#): In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”.

The McMaster Student Absence Form is a self-reporting tool for **Undergraduate Students** to report absences that last up to 5 days and provides the ability to request accommodation for any missed academic work. Please note, this tool cannot be used during any final examination period. You may submit a maximum of 1 Academic Work Missed requests per term. It is **your** responsibility to follow up with your Instructor immediately regarding the nature of the accommodation. If you are absent more than 5 days or exceed 1 request per term you **must** visit your Associate Dean's Office (Faculty Office). You may be required to provide supporting documentation. This form should be filled out immediately when you are about to return to class after your absence.

ACADEMIC ACCOMMODATION FOR RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVANCES (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the [RISO](#) policy. Students should submit their request to their Faculty Office **normally within 10 working days** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

COPYRIGHT AND RECORDING

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

PROTECTION OF PRIVACY ACT (FIPPA)

The Freedom of Information and Protection of Privacy Act (FIPPA) applies to universities. Instructors should take care to protect student names, student numbers, grades, and all other personal information at all times. For example, the submission and return of assignments and the posting of grades must be done in a manner that ensures confidentiality – see <http://www.mcmaster.ca/univsec/fippa/fippa.cfm>.

ANTI-DISCRIMINATION

The Faculty of Engineering is concerned with ensuring an environment that is free of all discrimination. If there is a problem, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer, or the Human Rights Consultant, as soon as possible. [https://www.mcmaster.ca/policy/General/HR/Discrimination and Harassment.pdf](https://www.mcmaster.ca/policy/General/HR/Discrimination%20and%20Harassment.pdf)

EXTREME CIRCUMSTANCES

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.

8. MCMASTER GRADING SCALE

Grade	Equivalent Grade Point	Equivalent Percentages
A+	12	90-100
A	11	85-89
A-	10	80-84
B+	9	77-79
B	8	73-76
B-	7	70-72
C+	6	67-69
C	5	63-66
C-	4	60-62
D+	3	57-59
D	2	53-56
D-	1	50-52
F	0	0-49