COURSE INFORMATION

Course Name: INTEGRATED CAPSTONE DESIGN COURSE   Course Code: **CE 4X06A/B**

Session Offered: Fall 2024 & Winter 2025

Calendar Description: Capstone project supervised by faculty members in civil engineering, involving design and synthesis that reinforces concepts from structural and/or municipal engineering. Exposure to elements of teamwork, sustainability, social responsibility, and project management.

Fall Instructor(s):	**Email**	**Office**	**Office Hours/Contact:**
Dr. Samir E. Chidiac	chidiac@mcmaster.ca		By Appointment
Dr. Yiping Guo	guoy@mcmaster.ca		By Appointment

Lecture Schedule Day(s):	Mon, Wed, Thu	Time:	5:30 PM – 6:20 PM
Laboratory Schedule Day(s):	Tu	Time:	1:30 PM – 2:20 PM
	Thu	Time:	12:30 PM – 1:20 PM

Winter Instructor(s):	**Email**	**Office**	**Office Hours/Contact:**
Dr. Peijun Guo	guop@mcmaster.ca		By Appointment
Dr. Zoe Li	zoeli@mcmaster.ca		By Appointment

Lecture Schedule Day(s):	Mon, Thu	Time:	5:30 PM – 6:20 PM
	Wed	Time:	5:30 PM – 6:20 PM
Laboratory Schedule Day(s):	Thu	Time:	12:30 PM – 1:20 PM

1. COURSE OBJECTIVES

This course will focus upon the maturing area of sustainability, with an emphasis on how sustainability relates to civil engineering and the sub-disciplines of civil engineering. This course is the integrated capstone design course for students in civil engineering, and places considerable emphasis on the fundamentals of design that minimize environmental impact and maximize the resiliency, vibrancy, and accessibility of built communities and their built infrastructure. The course project will focus on a real-world design application from a broad sustainability perspective, where several civil engineering and related sub-disciplines come into play.

2. COURSE SPECIFIC POLICIES

"**The instructor and university reserve the right to modify elements of the course during the term. The university and instructor may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on the changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.**"

1. **All email exchanges are to be via a McMaster University e-mail account**. **Emails from non-McMaster accounts will not receive a reply**.
2. We will not check nor reply to emails sent via Avenue.
3. Students are required to work together. If there are any problems, communication/delivery or other problems, among group members, you are encouraged to first resolve it among yourselves. If the problem is not resolved within one week, the group is expected to contact the instructor for assistance.

Student self-reflection

Every student is required to submit a self-reflection report on Friday September 27, 2024 and Thursday January 30, 2025. For information, students are strongly encouraged to read the "Engineering Reflection Guidebook" that was prepared by the McMaster University faculty of Engineering. The guide which is available at

https://ecampusontario.pressbooks.pub/engineeringreflectiontoolkit/, includes one module for training students on writing a reflection based on the "What? So what? Now what?" model, and another module to guide instructional teams with evaluating and providing feedback on a reflection essay.

Individual and Group Marks

To ascertain that each member of a group is contributing positively to the project, the chapter hand-ins and final report will largely be individually marked. In the proposal, each team must include ten (10) chapters and a tentative submission date for each chapter. The chapters' submission date(s) can be changed as many times as needed without penalty provided the submission schedule is revised no later than 2 days before the chapter submission date. All group members must contribute to every chapter. For each submitted chapter, every member of the team must submit their own summary of the chapter content and their contribution to the chapter. Group member(s) that do not have a chapter summary included with the submission will receive a zero for that chapter, and if the contributions of the individual group members are not specified, all the members will receive equal percentage. The percentage contribution to each chapter will be used to calculate the individual mark. Each chapter will be out of 10 with the technical content being 80%, and 20% for presentation and writing quality. For the final report, 25% of the grade will be a group mark which reflects the overall quality of the report (every member of the team will receive the same group mark) and 75% will be individual marks based upon their contribution to the final report. During the course, groups may resubmit up to 2 chapters for re-marking, however the entire group must agree that a chapter can be resubmitted. Chapters resubmitted for re-marking must include an additional section entitled "Response to Instructors Comments" that clearly describe how the comments/suggestions/ corrections of the TA/Faculty have been addressed in the revised chapter.

Chapter Due Dates

Chapters submission day is Monday and there will generally be a one-week turnaround for marking and feedback. The last day to submit chapters for grading and feedback is Monday November 25th, 2024, for the Fall term, and Monday February 24th, 2025, for the Winter term. The final report is due by noon on March 12, 2025.

Groups

All students will form self-selected groups of 6 people to a total of 20 groups. All groups are to be formed by September 6th, anybody not in a group will be assigned to one. If a student has not contacted their group by September 16, 2024, he/she will be asked to withdraw from the course. Proposals submission date starts September 23rd and ends September 26, 2024. Meetings between the groups and the instructors to review the proposal will be approximately 2 working days following the submission depending on the number and date of submissions. Each group will be assigned 2 TAs to advise the members while developing their proposal.

Chapter Completion

All groups are expected to successfully complete and submit a minimum of 4 chapters by the end of the Fall term. If 4 chapters were not submitted by the due date, a 10% penalty will be imposed on the final report. It should be noted that no more than 2 chapters can be submitted at one time.

Submissions

All the submissions are to be done electronically through A2L.

Additional Specific Information

The following two documents entitled "Introduction 2024.pdf" and "Project proposal.pdf" form part of the course outline.

Awards

Three awards will be handed out this year for the project that have 1) Best overall design, 2) Best innovative design, and 3) Design with most sustainability attributes. Also, five projects will be identified as potential candidates to represent the department at the CSCE conference for the capstone project competition. The selected groups will have to make a 5 to 7 min presentation to a committee that will select the group moving forward. The selected group will have expenses paid to travel and present the capstone project at the upcoming CSCE Conference. Details will be provided shortly.

McMaster team won the 2024 CSCE capstone project competition.

3. SCHEDULE

WEEK 1	Introduction	Form groups
WEEK 2-13	Optimization Sustainability Structural Information Transfer Municipal Information Transfer Geotechnical Information Transfer Building Science Information Transfer Pavement Information Transfer	Project proposal Self reflection reports Project Report Chapters Mini Presentations Peer evaluations

4. ASSESSMENT OF LEARNING

4. ASSESSMENT OF LEARNING	WEIGHT %
Self reflection (2 reports)	5%
Proposal (report and presentation/meeting)	5%
Chapter Hand-ins	40% (individual)
Final Poster presentation and/or project Video	10%
Final Design Project Report	40%

Late projects (Final Design Project Report) will be subject to a 10% per day penalty.

5. LEARNING OUTCOMES

Upon completion of the course, students will be able to:

1) Understand how to apply their undergraduate civil engineering knowledge to a contemporary design.
2) Design an engineering solution to a challenging contemporary problem, within realistic constraints and utilizing appropriate standards.
3) Use project management and teamwork skills to deliver a solution within time constraints.
4) Deliver a professional presentation appropriate to a broad audience.
5) Demonstrate effective written technical communication skills through final project reports.

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*, 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.

COURSE OUTLINE

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

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

COURSE OUTLINE

Civil Engineering 4X06
Integrated Capstone Design Course

Fall Term 2024-25

Samir E Chidiac, PhD PEng FCSCE - chidiac@mcmaster.ca

Yiping Guo, PhD PEng - guoy@mcmaster.ca

Winter Term 2024-25

Zoe Li, PhD PEng – zoeli@mcmaster.ca

Peijun Guo, PhD PEng - guop@mcmaster.ca

September 4, 2024

TA – Fall 2024

1. **Mohamed Elgendy (Water)**   elgendym@mcmaster.ca
2. **Almustafa Monjee (Structural)**   almustm@mcmaster.ca
3. **Yuhang Gu (Transportation)**   gu1@mcmaster.ca
4. **Tarek Biddah (Structural)**   biddaht@mcmaster.ca
5. **Mohamed Abouyoussef (Structural)**   abouyoum@mcmaster.ca

Course Description

This course is the integrated capstone design course for students in civil engineering, and places considerable emphasis on the fundamentals of design that minimize environmental impact and maximize the resiliency and vibrancy of built communities and their built infrastructure. The course project will focus on a real-world design application from a broad sustainability perspective, where several civil engineering and related sub-disciplines come into play.

What is Required

- Lots of civil engineering analysis and design
- Most civil engineering sub-disciplines
- A sustainability element
- An economic element
- An innovation element
- An EDI [Equity/Diversity/Inclusion] element - Accessibility
- Quantifiable technical justification for <u>all</u> decisions

Schedule – Fall 2024

Day	Time	Activity	Room
Monday	5:30-6:20	Information Session	KTH B135
Tuesday	1:30-2:20	Lab	MDCL 1102
Wednesday	5:30-6:20	Information Session	KTH B135
Thursday	12:30-1:20	Lab	KTH B135
Thursday	5:30-6:20	Information Session	KTH B135

Milestones

- Groups – September 06, 2024
- Proposals – September 23-26, 2024
- Self-Reflection 1 – Friday September 27, 2024
- Meetings with Instructors/TAs – September 25 – October 07 2024
- Mini Presentation – Monday November 4, 2024
- Meetings with Instructors/TAs – January 08, 2025
- Self-Reflection 2 – Thursday January 30, 2025
- Project report due – noon Monday March 12, 2025
- Poster / Video Presentation – Dates to be announced

Anybody that has not contacted their group by September 16, 2024, will be required to withdraw from this course.

Assessment

Self-Reflection	5%	
Proposal (report and meeting)	5%	
Chapter Hand-ins	40%	(individual)
Final Poster Presentation / Video	10%	
Final Design Project Report	40%	(25% group & 75% individual)

Individual and Group Marks

- All group members are required to contribute to every chapter.

- For every chapter, the following information must be included for the chapter to be graded:

  1. Member's individual summary of the chapter content in his/her own words (be careful with plagiarism),

  2. his/her contribution to the chapter, and

  3. his/her contribution in percentage of the total.

  The information is used to assign your percent of the chapter mark.

  Ex 1. Mark=8/10, No of members = 6, Contribution = 1/6, Mark = 6*(8)*1/6 = 8/10 for that chapter.

  Ex 2. Mark=8/10, No of members = 6, Contribution = 10%, Mark = 6*(8)*0.1 = 4.8/10 for that chapter.

Proposal

- Executive Summary
- Introduction
- Objective
- Description of project (details such as location, design elements, architectural drawings, scope…)
- Identify the Innovative aspect of your design
- Identify the Sustainability Element, the Economic Element, and Accessibility (EDI) element
- Detailed breakdown of the 10 chapters
- Identify learning gaps
- Schedule – Tentative submission dates for the 10 chapters

Self-Reflection

- All group members are required to submit Self-reflection.

Mini Presentations Monday November 4th

- Each group will have one member present a short synopsis of their project
- The presentation will be a maximum of 7 minutes
- You need to provide the following:
  - A description of the project
  - The innovations/sustainability/Accessibility within it
  - The technical challenges you have or expected to encounter
- Please submit your PPT presentation by 8:30am on Monday Nov 4th (name your file with your group #)

Chapter Hand-Ins

- Chapters are to be submitted on Mondays and there will generally be a one-week turn around for marking and feedback.
- All the submissions and marking will be done electronically through A2L.
- The last day to submit material in the Fall semester is November 25th
- The last day to submit chapters for grading and feedback is Monday February 24th.

Submitting Chapters

- Electronic submissions are due on Mondays at 9:30 am on A2L.
- Always include a title page with a project summary at the front, Individual member chapter summary, and group members contribution pages at the end of the document.
- On the title page include the group number, team members name and student number, date of submission, title, and chapter number
- Summary consists of a short paragraph that describes the project
- All submissions to Avenue are to be pdf (including revised schedules)
- Each week a maximum of 2 chapters can be submitted for review and marking (including resubmissions)
- Resubmitted chapter must include a section entitled "Response to Reviewer Comments" which clearly document the response to the comments and steps/approach taken to address them.

Online Submissions

- This is the naming convention for chapter submissions to Avenue:

  'group'#_'chapter'#_Title.pdf

  ### i.e. group14_chapter4_Structural_Loads.pdf

- There is also a naming convention for schedule revisions:

  'group'#_'schedule'_'v"#.pdf

  ### i.e. group14_schedule_v4.pdf

Updating Schedules

- If a chapter does not get handed in on the scheduled time, the group receives a zero mark for that chapter
- There is no penalty for revising your schedule
- **Schedule revisions must be submitted to Avenue Dropbox by Friday at Midnight for any changes that affect the Monday submission**
- **Failure to update your schedule by Friday will mean an automatic zero for the chapter that was due on Monday**
- The marking rubric for each chapter will vary slightly depending on the structure of the submitted report

Re-Submitting Chapters

- Two chapters may be re-submitted for re-marking
- The last day to re-submit a chapter in the Fall term is Monday November 25th
- The original marked chapter along with the Response to Reviewer Comments **must** be included for the revised chapter to be marked

Consultation

- Instructors, and TAs are happy to help you
- You need to complete and submit a Consultation Request Document with all the details and we will contact you to confirm the meeting
- The form will be available on Avenue
- We are here to assist you and advise you

Good Luck and Stay Safe