Civil Engineering
CIVENG 4CA4
Construction Management and Automation
Winter 2026

McMaster University
ENGINEERING

Instructor Information

Dr. Saiedeh Razavi
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Office Hours:
Weekdays by Appointment

TA Information

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Class Times

Lectures:

Tuesdays 2:30-4:20 PM,

Thursdays 2:30 -3:20 PM

Tutorials:

We 12:30PM - 2:20 PM

Class Format

In Person Attendance is Required for This Course.

Course Dates: 01/05/2026 - 04/07/2026
Units: 4.00
Course Delivery Mode: In Person
Course Description: This course covers the fundamental concepts of construction projects and construction management as well as tools and techniques in construction scheduling, estimating, and project control. The course includes an introduction to a range of computer-aided construction management tools and concepts including Building Information Modeling (BIM), automation and telematics, and advanced technological trends in construction. Three lectures, one tutorial (two hours); one term Prerequisite(s): ENGINEER 2B03 or ENGINEER 3PX3 or IBEHS 4P04 Anti-Requisite(s): CIVENG 3RR3, 4CM4

Instructor-Specific Course Information

- Attending lectures and tutorials is mandatory. Our goal is to provide an environment that is free of discrimination and harassment, as well as that supports you to become competent in transportation engineering.
- All formal communications regarding this course will be through Avenue to Learn (A2L).
- In addition to using A2L as our Learning Management System, **we will be using Top Hat** (https://tophat.com) for class participation. Top Hat is an educational platform that integrates interactive features into learning materials, enhancing class engagement and comprehension.

- To enrol correctly into your course on Top Hat, you **must click the Top Hat Link** in your course in A2L under the "Content" and then enroll. You will have the option to either create a student account or log in to an existing Top Hat account. If you are signing up for Top Hat for the first time, please use your official school email address and a web browser to complete the process.
- This course has a group project. Groups are self-selecting and self-governing. Teams are expected to prepare and submit a “Group Contract,” for which a sample is provided on A2L. Those not joining any group by the deadline must complete the project individually.
- In-class demonstrations of software tools will be presented. They are intended to provide students with preliminary introductions to the tools and give them a “jump start,” not to fully train students on the use of tools. Students will require self-study before they can work effectively with the tools.

Meeting Details

Our goal is to provide an environment that is free of discrimination and harassment, as well as an environment that supports your learning in construction management. If you require a meeting with the instructor or TAs outside the classroom, communicate with them using your McMaster e-mail account and/or Avenue to Learn. The e-mail subject line must start with the course number (otherwise, your e-mail may receive a low priority). Meetings can be coordinated to be in-person or online.

Important Links

- Mosaic
- Avenue to Learn
- Student Accessibility Services - Accommodations
- McMaster University Library
- eReserves

McMaster University's writing support: https://studentsuccess.mcmaster.ca/writing-andacademic-

skills/appointments/

Land Acknowledgement: We recognize and acknowledge that students of McMaster University meet and learn on the traditional territories of the Mississauga and Haudenosaunee nations and within the lands protected by the "Dish With One Spoon" wampum, an agreement to peaceably share and care for the resources around the Great Lakes.

Please find more information at the following links:

https://libguides.mcmaster.ca/welcome-to-mcmaster

https://indigservices.mcmaster.ca

Course Learning Outcomes

- Life-Long Learning: Through the term project, students will be able to critically evaluate and apply knowledge, methods and skills procured through self-directed and self-identified sources, including those that lie outside the nominal course curriculum. Students are encouraged to consult with construction practitioners to gain a better understanding and to fulfill the requirements of the projects (CEAB Indicator 12.2).

- Use of Tools: The ability to create, adapt, modify and extend tools and techniques to manage and solve problems, in particular in project and construction management. The students will learn tools and techniques for planning, scheduling, estimating, and project control and will develop the ability to adopt or enhance them to manage projects more efficiently (CEAB Indicator 5.2).

- Communication: Through active participation in the course and also term group projects, students Students will learn to deliver an effective oral presentation of their term project to the class. (CEAB Indicator 7.2 and 7.3).

Graduate Attributes

The Canadian Engineering Accreditation Board (CEAB) is a division of Engineers Canada and is responsible for accrediting undergraduate engineering programs across Canada. Accreditation by the CEAB ensures that the engineering programs meet a national standard of quality and cover essential educational requirements. Graduate Attributes are a set of qualities and skills that the CEAB expects engineering graduates to possess. These attributes are a benchmark for the learning outcomes of accredited engineering programs. This section lists the Graduate Attribute Indicators associated with the Learning Outcomes in this course. The following Graduate Attribute indicators are associated with this course and its learning outcomes as indicated in the previous section.

- CEAB 12.2: Seeks and acquires appropriate external information as required, including showing awareness of sources of information and ability to critically evaluate them (1st learning outcome);
- CEAB 5.2: Successfully uses engineering tools (2nd learning outcome);
- CEAB 7.2 Composes an effectively written document for the intended audience (3rd learning outcome);
- CEAB 7.3 Composes and delivers an effective oral presentation for the intended audience (3rd learning outcome).

Lab Safety

The Faculty of Engineering is committed to McMaster University's Workplace and Environmental Health and Safety Policy which states: "Students are required by University policy to comply with all University health, safety and environmental programs". It is your responsibility to understand McMaster University Workplace and Environmental Health and Safety programs and policies. For information on these programs and policies please refer to McMaster University Health and Safety. The Lab Safety Handbook is available here, as well as on A2L.

It is also your responsibility to follow any specific Standard Operating Procedures (SOPs) provided for some of the experiments and the laboratory equipment. A laboratory-specific

set of rules can also be added to ensure that students fully understand laboratory safety rules that are in place prior to their first session.

Course Schedule

- Introduction to the Course
- Introduction to Microsoft Project
- Construction Industry & Construction Project Management
- Construction project participants
- Construction Risks and Project Delivery Methods
- Construction Contracts
- Introduction to BIM and Integrated Project Delivery
- New Technologies and Trends in the Construction Industry
- Scheduling Fundamentals & Network Diagrams
- Critical Path Method (CPM & PDM)
- Resource-Constrained Scheduling Techniques
    - Recourse Levelling
    - Resource Allocation
    - Time-Cost Trade-Off
- Estimating Fundamentals
- Project Control and Earned Value Method
- Construction equipment & Civil and Site Work
- Earthmoving Materials and Operations
- Construction Health, Safety, and Law

Required Materials and Texts

Please sign in with your MacID here to view your booklist

Project Management Institute RSMeans Cost Data Student Edition
Publisher: R. S. Means Company, Incorporated
Publication Date: 2012
https://ebookcentral.proquest.com/lib/mcmu/reader.action?docID=843674&ppg=3

Optional Course Materials

Please sign in with your MacID here to view your booklist

BIM Handbook : A Guide to Building Information Modeling for Owners, Designers, Engineers, Contractors, and Facility Managers
Authors: Eastman, Ch., Teicholz, P., Sacks, R., Liston, K.
Publisher: Wiley & Sons, Inc.
Publication Date: 2018
Edition: 3rd
https://ebookcentral.proquest.com/lib/mcmu/detail.action?docID=5447327

Construction Management, 4th Edition
Authors: Daniel W. Halpin and Bolivar A. Senior.
Publisher: John Wiley & Sons, Inc
Publication Date: 2011
Edition: 4th

Managing the Construction Process: Estimating, Scheduling, and Project Control
Authors: Gould, F. E
Publication Date: 2012
Edition: 4th

Computer-Based Construction Project Management
Authors: Hegazy, T
Publisher: Prentice Hall
Publication Date: 2002

Construction Planning, Equipment, and Methods
Authors: Peurifoy, Robert L., Schexnayder, Cliff J., Schmitt, Robert, Shapira, Aviad
Publisher: McGrawHill
Publication Date: 2018
Edition: 9th
https://mcmaster.primo.exlibrisgroup.com/permalink/01OCUL_MU/deno1h/alma991028679449707371

Course Evaluation

Assessment of Learning	Weight (%)
Class Participation and Quizzes	15%
Midterm 1	25%
Midterm 2 (Cumulative)	25%
Term Project	15%
Assignments	20%

Undergraduate Grading Scale

The McMaster 12 Point 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

Grade	Equivalent Grade Point	Equivalent Percentages
D	2	53-56
D-	1	50-52
F	0	0-49

Graduate Grading Scale

Graduate Student Grading Scale (Except for MBA and Master of Finance)

Grade	Points	Equivalent Percentage	Pass/Fail
A+	12	90-100	P+
A	11	85-89	P
A-	10	80-84	
B+	9	77-79	
B	8	73-76	
B-	7	70-72	
F	0	69 and under	F

MBA and Master of Finance Grading Scale

Grade	Points	Equivalent Percentage	Pass/Fail
A+	12	90-100	P+
A	11	85-89	P
A-	10	80-84	
B+	9	75-79	
B	8	70-74	
B-	7	60-69	
F	0	59 and under	F

Late Assignments

No late assignments will be accepted.

Absences, Missed Work, Illness

Following the MSAF policy, the MSAF accommodation for this course will be to reallocate the weight of missed items at the discretion of the instructor and in consultation with the

undergraduate advisor.

Students who **miss any of the Midterms (25%)** due to unforeseen circumstances may be eligible for a rewrite. To qualify for such accommodations, students must report to their Faculty/Program Office to discuss their situation. They will be required to provide appropriate supporting documentation (See the documentation requirements in the Policy on Requests for Relief for Missed Academic Term Work). If warranted, the Faculty/Program Office will approve the absence, and the instructor will determine appropriate relief.

Course Modification

The instructor reserves the right to change the dates and deadlines for any elements of the course. Changes will be communicated through regular communication channels, such as in-class announcements and notifications on A2L.

Generative AI: Some Use Permitted

Students may use generative AI for editing/translating/outlining/brainstorming/revising their work throughout the course so long as the use of generative AI is referenced and/or acknowledged in their submitted work. Use of generative AI outside the stated use of [editing/translating/outlining/brainstorming/revising/etc.] without citation or acknowledgement will constitute academic dishonesty. It is the student's responsibility to be clear on the limitations for use and to be clear on the expectations for citation and reference, and to do so appropriately.

Turnitin.com

We use a web-based service (Turnitin.com) to reveal the authenticity and ownership of student-submitted project reports. Students will be expected to submit their work electronically via the A2L platform 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.

APPROVED ADVISORY STATEMENTS

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.

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

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. Avenue to Learn, 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, 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

In the event of an absence for medical or other reasons, students should review and follow the Policy on Requests for Relief for Missed Academic Term Work.

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.

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, Avenue to Learn and/or McMaster email.