Department of Civil Engineering  
McMaster University
CIV ENG 4CM4 – Construction Engineering and Management, Fall 2017

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Days</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVENG 4CM4-C01</td>
<td>Construction Eng. &amp; Mngt. (Lecture)</td>
<td>Tue</td>
<td>8:30 - 10:20</td>
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<td></td>
<td></td>
<td>Thurs</td>
<td>8:30 - 9:20</td>
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<tr>
<td>CIVENG 4CM4-T01</td>
<td>Construction Eng. &amp; Mngt. (Tutorial)</td>
<td>Fri</td>
<td>14:30 - 16:20</td>
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</tbody>
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INSTRUCTOR:  
Samin Shokri, samin.sh@gmail.com  
Office hours: TBA

TAs:  
Shuming Du, dus5@mcmaster.ca, Office Hours: TBA

COURSE OVERVIEW
This course covers fundamental concepts of construction engineering and management; advanced scheduling techniques; scheduling linear and repetitive projects; improving schedules; time-cost trade-offs; and resource allocation and leveling. The course also covers various computer-aided project management and scheduling techniques, construction safety, construction site work and materials management, and earthwork operations in construction.

Success in this course heavily relies on the student’s participation and engagement and therefore the attendance and participation are necessary. The course materials will be supplemented by guest lectures, computer labs, audiovisual materials and/or site visits.

LEARNING OUTCOMES

- Investigation:
  ✓ Students will be capable of selecting appropriate construction scheduling model and methods and identify assumptions and constraints in the resources (CEAB Indicator 3.2).
  ✓ Students will be able to estimate outcomes and uncertainties in terms of project duration and cost, and determine appropriate equipment or data type to collect (CEAB Indicator 3.3).

- Learning:
  ✓ Through the term project and the course assignments, 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 contractors and consultants to fulfill the requirements of the projects and assignments (CEAB Indicator 12.1).

- Team Work:
  ✓ Through active participation in the course and also term group project, students will be able to develop and implement processes and methodologies to manage the effectiveness of a team both in terms of the quality of the work produced by the team as well as the inter-personal relationships within the team. This is an important skill that is essential for the success of students in their future careers. (CEAB Indicator 6.2).
COURSE OUTLINE

- Introduction to the course
- Project scheduling overview
- Scheduling of linear and repetitive projects
- Constraint-based scheduling: Resource allocation
- Constraint-based scheduling: Resource leveling
- Constraint-based scheduling: Time/Cost trade-offs
- Scheduling: PERT
- Computer-aided project management
- Construction safety
- Construction site work and materials management
- Earth work operation
- Advanced technologies in construction

RECOMMENDED TEXTS (optional)


OTHER REFERENCES


COURSE EVALUATION

Grade components will be weighted as follows in computation of the final course grade:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>5 Assignments (3% each)</td>
<td>15%</td>
</tr>
<tr>
<td>Computer Project</td>
<td>15%</td>
</tr>
<tr>
<td>Midterm</td>
<td>30%</td>
</tr>
<tr>
<td>Term Group Project</td>
<td>30%</td>
</tr>
<tr>
<td>Class Participation</td>
<td>10%</td>
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- Late submission of assignments and projects will not be accepted.
TERM PROJECT

Students are expected to perform a comprehensive research study on one of the project topics and report on the state of the art on that topic. It is students’ responsibility to understand what constitutes academic dishonesty and avoid it. It is also extremely important to reference the work properly and according to the standards.

Project Topics:

- Your suggested topic (to be approved by the instructor)
- Civil Information Modeling (CIM)
- Virtual reality in construction
- Automated resource tracking and control
- Modularization
- Lean Construction
- Intelligent jobsites technologies and applications
- Automation in construction management practices
- Construction site planning, layout and control
- Paving
- Cast-in-place concrete
- Precast concrete
- Tunneling construction
- Non-invasive, non-destructive condition assessment of civil infrastructure

The term project will be conducted, reported and presented by teams of 3 to 5 students. The teams are self-selecting and self-governing. Teams will be randomly scheduled for final presentations. Presentations should be a collaborative effort and all members are expected to be available.

POLICIES

Discriminations
The Faculty of Engineering is concerned with ensuring an environment that is free from all adverse discrimination. If there is a problem that cannot be resolved by discussion among the persons concerned, individuals are reminded that they should contact their department chair, the sexual harassment office, or the human right consultant as soon as possible.

Academic Dishonesty
Attention is drawn to the “Statement of Academic Ethics” and the Senate Resolutions on Academic Dishonesty as found in the Senate Policy Statement distributed at registration and available in the Senate office. Any student who infringes one of these resolutions will be treated according to the published policy.

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and 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.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty, please refer to the Academic Integrity Policy, specifically Appendix 3, located at: https://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf
The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
2. Improper collaboration in group work or individual assignments.
3. Copying or using unauthorized aids in tests and examinations.

Requests for Relief for Missed Academic Term Work (Assignments, Mid-Terms, etc.)
The McMaster Student Absence Form is a self-reporting tool for Undergraduate Students to report absences that last up to **3 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 3 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.

http://academiccalendars.romcmaster.ca/content.php?catoid=11&navoid=1698#Requests_for_Relief_for_Missed_Academic_Term_Work

Student Code of Conduct

The Student Code of Conduct (SCC) exists to promote the safety and security of all the students in the McMaster community and to encourage respect for others, their property and the laws of the land. McMaster University is a community which values mutual respect for the rights, responsibilities, dignity and well-being of others. The purpose of the Student Code of Conduct is to outline accepted standards of behavior that are harmonious with the goals and the well-being of the University community, and to define the procedures to be followed when students fail to meet the accepted standards of behavior. All students have the responsibility to familiarize themselves with the University regulations and the conduct expected of them while studying at McMaster University.


**Note:** This structure represents a plan and is subject to adjustment. The instructor and the university reserve the right to modify elements of the course during the term. The university 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 changes.

Course-Specific Policies

Students are expected to attend and actively participate in class sessions offering insight, comment, reinforcement, contrary views, and underscoring examples.

**Late assignments will not be accepted.** Assignments that have not been submitted by the due date/time will not be graded and will receive a mark of ZERO.

Announcements made in class or placed on Avenue are considered to have been communicated to all students including those individuals that are not in class.