Department of Civil Engineering
McMaster University
CIV ENG 4CM4 – Advanced Construction Management, Fall 2018

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Days</th>
<th>Time</th>
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<tbody>
<tr>
<td>CIVENG 4CM4-C01</td>
<td>Construction Eng. &amp; Mngt. (Lecture)</td>
<td>We</td>
<td>12:30 - 13:20</td>
<td>ABB 164</td>
<td>Sep 4, 2018-Dec 5, 2018</td>
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<td>Mo</td>
<td>14:30 - 16:20</td>
<td>ABB 164</td>
<td>Sep 4, 2018-Dec 5, 2018</td>
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<tr>
<td>CIVENG 4CM4-T01</td>
<td>Construction Eng. &amp; Mngt. (Tutorial)</td>
<td>Th</td>
<td>14:30 - 16:20</td>
<td>JHE 326H</td>
<td>Sep 4, 2018-Dec 5, 2018</td>
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INSTRUCTOR:
Saiedeh Razavi, JHE-337, razavi@mcmaster.ca
Office hours: By appointment, JHE-337

TA:
Shuming Du, dus5@mcmaster.ca, Office Hours: Fr. 2-4PM, TA office room (JHE 329A)

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, earth work operations, and the advanced technology trends in construction.

Success in this course heavily relies on the student’s participation and engagement and therefore the attendance and participation are necessary. The materials of the course will be provided via the Top Hat teaching platform to facilitate the engagement of the students. The course materials will be supplemented by site visits, guest lectures, computer labs, and/or audiovisual materials.

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).
RECOMMENDED TEXTS (optional)


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

- Assignments: 25%
- Midterm: 40%
- Term Group Project: 20%
- Class Participation and Avenue Quizzes: 15%

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
- Building Information Modeling (BIM)
- Construction safety
- Construction site work and materials management
- Earth work operation
- Advanced technology trends in construction

SOFTWARE DEMONSTRATIONS
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 will be able to work effectively with the tools.
TERM PROJECT
Building information modeling (BIM) is dramatically changing the way infrastructure projects are designed, constructed, and operated today. Some project teams apply BIM in a specific phase like design; some use BIM throughout the project lifecycle.

Develop one case study on one project that utilized BIM in any way and discuss the following:

• Briefly describe the project and the challenges faced which led to the use of BIM.
• What technologies were used? Why were these technologies pertinent to the problem they were addressing?
• How was BIM implemented in the project and in which phase of project lifecycle?
• How did these technologies facilitate project success? Were there any measurable improvements?
• What challenges were faced in BIM implementation?

Deliverables: Each team should prepare a 10-15-minute presentation for their case study and an 8-12 pages written report on their case study (page limit includes figures and references). Follow the formatting instructions that will be provided by the instructor.

Deadlines: Please refer to our class schedule for your project due date.

Sources of information: Your project will be based on interviews with project participants, site visits and project documents. Given that getting in touch with professionals and finding a project to develop a case study on requires considerable time, you are encouraged to start early!

The term project will be conducted, reported and presented by teams of 2 to 3 students. The teams are self-selecting and self-governing. Teams will be randomly scheduled for final presentations. The presentation does not need to be collaborative but all members are expected to be available during the presentation.

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
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.

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.

It is your responsibility to understand what constitutes academic dishonesty. For information on the
various types of academic dishonesty please refer to the Academic Integrity Policy, located at www.mcmaster.ca/academicintegrity.

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.

Academic Accommodation of Students with Disabilities

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

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 worth less than 30% of the final grade. 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. http://academiccalendars.romcmaster.ca/content.php?catoid=11&navoid=1698#Requests_for_Relief_for_Missed_Academic_Term_Work

Academic Accommodation for Religious, Indigenous or Spiritual Observance (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students requiring a RISO accommodation 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.

Course-Specific Policies

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

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.

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.

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.