CE3C03/Civil Engineering Systems: Course Outline

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Assistants: Mohamed Salama [sallmm8@mcmaster.ca]

Schedule:
- Wed. & Fri. 15:30-16:20 - Lecture, CNH/B107
- Tue. 15:30-17:20 - Tutorial, ABB271
- Fri. 16:30-18:20 - Tutorial, CNH/106

Office Hours: Thursday 14:30-16:30

Course Description:
This course is intended to provide an appreciation of system analysis and planning within the context of civil engineering practice. The following topics are covered in this course:

- Introduction to system approaches
- Linear programming
- Integer programming
- Dynamic programming
- Nonlinear programming
- Modelling and simulations
- Decision Analysis
- Project Management

While the underlying theory of these topics, their potential for application in working world is an important part of this course. The course requires significant use of computers for optimization and simulation, either with spreadsheet packages or Matlab.

Learning Outcomes:

1. Ability to use and evaluate various advanced numerical tools for optimization and simulation of optimization and simulation problems, both theoretical and practical.
   - CEAB attribute 5.1 "The ability to evaluate and select appropriate modern tools"
   - CEAB attribute 5.2 "The ability to use of modern/state of the art tools"

2. Ability to write professional (memorandum) report with appropriate attention to descriptive and algebraic representations of problem formulations, key results and writing quality.
   - CEAB attribute 7.1 – Demonstrate an ability to respond to technical and non-technical instructions and questions
   - CEAB attribute 7.3 "Constructs effective written arguments"

3. To be able to make decisions by applying economic principles for problems with limited time/resources with proper objectives/scopes
   - CEAB attribute 11.2 "Can plan and effectively manage time, resources, and scope"
Course evaluation and grading:

- Minor Assignments 20%
- Major Assignments 40%
- Final Examination 40%

To pass this course, one must complete and hand in all major assignments.

Upon request by submitting a MSAF form, one week’s extension will be automatically given for a major assignment.

Ethics

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, Appendix 3:

http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf

The following illustrates only some forms of academic dishonesty:
1. Plagiarism, e.g., copying another’s material verbatim as well as paraphrasing another’s ideas without providing one’s source(s) for the materials.
2. Helping or attempting to help another to commit an act of academic dishonesty, such as cheating or plagiarism.
3. Copying or using unauthorized aids in tests and examinations.

University statement on changes of the course:

The instructor and McMaster University reserves the right to change or revise information contained in course outlines in extreme circumstances. If a modification becomes necessary, reasonable notice and communication with the students will be given with an explanation and the opportunity to comment on changes. It is the responsibility of students to check regularly their primary email account via their@mcmaster.ca alias and course website.

Academic Accommodation of Students with Disabilities:

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. 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 Policy for Academic Accommodation of Students with Disabilities.

CE3C03 Course Schedule (tentative):
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<th>Week of</th>
<th>Wednesday (Lecture)</th>
<th>Friday (Lecture)</th>
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<tr>
<td>Sept. 4</td>
<td>Systems Approach</td>
<td>Linear Programming</td>
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<td>Sept. 11</td>
<td>Linear Programming</td>
<td>Linear Programming</td>
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<td>Sept. 18</td>
<td>Linear Programming</td>
<td>Integer Programming</td>
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<tr>
<td>Sept. 25</td>
<td>Integer Programming</td>
<td>Dynamic Programming</td>
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<td>Oct. 2</td>
<td>Dynamic Programming</td>
<td>Dynamic Programming</td>
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<td>Oct. 9</td>
<td>Midterm Recess</td>
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<td>Oct. 16</td>
<td>Nonlinear Programming</td>
<td>Nonlinear Programming</td>
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<td>Oct. 23</td>
<td>Nonlinear Programming</td>
<td>Nonlinear Programming</td>
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<tr>
<td>Oct. 30</td>
<td>Simulation</td>
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<td>Nov. 6</td>
<td>Simulation</td>
<td>Simulation</td>
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<td>Nov. 13</td>
<td>Decision Analysis</td>
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<td>Nov. 20</td>
<td>Decision Analysis</td>
<td>Decision Analysis</td>
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<td>Nov. 27</td>
<td>Project Management</td>
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<td>Dec. 4</td>
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