Department of Civil Engineering  
McMaster University  
(Term 2: January – April, 2019)  

**CIV ENG 4Y04 BRIDGES AND OTHER STRUCTURAL SYSTEMS**

**Instructor:** Prof. K.S. Sivakumaran, P.Eng., Tel. Ext: 24814, E-mail: civeng4y04@mcmaster.ca  
Room: JHE-229, Office Hours: Weekdays (Make appointment via e-mail)

**Schedule:**  
*Lectures:* Monday(15:30-16.20), Tuesday(16:30-17.20), Thursday(15:30-16.20)  
*Tutorial:* Monday (9.30-11.30)  
T13 - 127  
ABB -163

**Attendance at the lectures and the tutorials is mandatory for this course.**

The following activities are prohibited during lectures and tutorials; Cell phone use, including texting, e-mails, etc. Audio, video or any other forms of recording. Talking or any other disruptive activities.

**Course Website:** Follow the links from http://avenue.mcmaster.ca  
[It is each student’s responsibility to check the website at least on a weekly basis for assignment postings and for update information.]

**Teaching Assistant:**  
(See course website for further information on the teaching assistant for the course)

**Course Objectives:**  
The objective of this course is to provide the necessary background materials in order that a student will be able to (1) understand the behavior of bridge elements and other structural systems and (2) undertake analysis and design of such elements and systems. This course lays the foundation needed for the design of highway bridges in accordance with Canadian (Ontario) bridge design code (CAN/CSA-S6- "Canadian Highway Bridge Design Code") and other structural systems in accordance with Canadian standards for such systems (CSA-S16- “Design of Steel Structures” and CSA A23.3-"Design of Concrete Structures")

**Course Outline:**

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>APPROXIMATE NUMBER OF LECTURES</th>
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<tbody>
<tr>
<td>Introduction to Bridges, Loads on Bridges and Simple Methods of Analysis for Bridge Responses</td>
<td>6</td>
</tr>
<tr>
<td>Analysis and Design of Steel-Concrete Composite Members</td>
<td>6</td>
</tr>
<tr>
<td>Analysis and Design of Steel Plate Girders</td>
<td>9</td>
</tr>
<tr>
<td>Analysis and Design of Pre-stressed Concrete Members</td>
<td>15</td>
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**NOTE:** The above list indicates the topics anticipated to be covered during the periods shown. Depending on time constraints these topics may be re-assigned to different periods or canceled. Time permitting additional topics may be introduced for the course.
Assignments:
SIX assignments will be distributed (via the course web site) for this course. The purpose of the assignments is to give the student an opportunity to develop an in-depth understanding of the course material. Assistance on the assignments will be available at tutorial sessions. Student should try to solve the assigned problems before the tutorial time, and then discuss the difficulties during the tutorial time. These assignments are considered individual effort components. The assignment solutions that you submit for grading must be absolutely your own work.
Academic Integrity Policy violations will be prosecuted to the fullest extent possible.
(Please refer to the Academic Integrity Policy, located at http://www.mcmaster.ca/academicintegrity/)

<table>
<thead>
<tr>
<th>Assignment Number</th>
<th>Web-Posting of Assignment Questions</th>
<th>Assignments Due Date (12 noon on the due date)</th>
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<tbody>
<tr>
<td>1</td>
<td>11 January</td>
<td>25 January</td>
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<tr>
<td>2</td>
<td>25 January</td>
<td>08 February</td>
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<tr>
<td>3</td>
<td>08 February</td>
<td>15 February [1 week]</td>
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<tr>
<td>4</td>
<td>01 March</td>
<td>15 March</td>
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<td>5</td>
<td>15 March</td>
<td>29 March</td>
</tr>
<tr>
<td>6</td>
<td>29 March</td>
<td>05 April [1 week]</td>
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</tbody>
</table>

Assignments are due at the time and date specified on the assignment sheet. Assignments are to be submitted to the CE4Y04 box outside JHE-301 (no submissions are to be made to any other location).
- **Late assignments will not be accepted.**
- Solutions will be posted on the course website.
- Marked assignments will be returned to students during tutorial times only.
- McMaster Student Identification will be needed to collect marked assignments.
- Uncollected marked assignments will be with the teaching assistant until 30 April 2019.

Examinations:
Term Test: There will be a two hour Term Test.
Final Examination: There will be a 2½ hour final examination scheduled during the April examination period.

| During the Term Test and the Final Examination, appropriate Design Manuals [TBA] will be permitted, however, books, course pack, class notes, and similar items will NOT be permitted. Additional materials may be provided during these examinations. ONLY McMaster Standard Calculator (Casio fx-991 MS or MS Plus) will be permitted. |

Evaluation and Distribution of Marks:
The performance will be evaluated based on the six assignments, the term test and the final exam. Each item carries the following weight:
Assignments: **30**%; Term Test: **30**%; Final Examination: **40**%

You must obtain at least 50% of the total possible marks in the two examinations combined (35 out of 70) for the assignments to be counted in your final course grade. The final percentage grade will be converted to a letter grade using the Registrar's scale shown in the McMaster Undergraduate Calendar.
Special Presentations:
Arrangements will be made to invite bridge engineering experts to make special presentations during some of the tutorial times. Films and slide presentations may also be made during some of the other tutorial times. These presentations are valuable and integral parts of the course and as such all students are required to be present during these presentations. The anticipated activities associated with each tutorial time will be announced during a lecture period and/or in the course web site.

Reference Books:
• CAC, Concrete Design Handbook, Cement Association of Canada", 4th Edition, Ottawa, ON, 2017 (This contains A23.3-14, Design of Concrete Structures)
• CPCI, Design Manual for Precast and Prestressed Concrete, Canadian Prestressed Concrete Institute, Ottawa, ON, 5th Edition, 2017. [PDF can be downloaded free @ http://www.cpci.ca]
• Collins, M.P., and Mitchell, D., Prestressed Concrete Basics, Canadian Prestressed Concrete Institute, 1994.
(Thode Library contains several other relevant books on these topics.)

Policy Reminders:
Students are reminded of the following Policies:
Calculators: Only the McMaster Standard Calculator (Casio fx-991 MS or MS Plus) may be used during tests and examinations.
Adverse Discrimination: "The Faculty of Engineering is concerned with ensuring an environment that is free of 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 the Department Chair, the Sexual Harassment Officer or the Human Rights Consultant, as soon as possible."
Academic Integrity (Ethics and Dishonesty): "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 http://www.mcmaster.ca/senate/academic/ac_integrity.htm The following illustrates only two 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. Copying or using unauthorized aids in tests and examinations.
DISPUTE RESOLUTION PROCEDURES FOR ASSIGNMENTS AND TERM TEST

• It is possible that some students may have disputes related to the marking of assignments and term test.
• Students have **ONE (1) week** to lodge their objections [One week after returning the marked papers during the tutorials].
• Assignments and term test written in pen only will be considered for dispute resolutions.
  [Hint! **Do not use pencils to write the assignments and the term test**]

Step:1 Download or view the corresponding official solutions posted in the course web-site. Compare your solutions to official solutions and the marking scheme (if available).

Step:2 If there are any complaints, all complaints MUST be submitted in writing. Take another clean sheet of paper and write the complaints. [Do NOT write the complaints on the answer book (assignment), and in fact do NOT write anything on the marked answer book (assignment)].

Step:3 Each complaint must indicate the following THREE items.
• [A] Which problem(s) number(s) are you complaining about?
• [B] What is the nature of the complaint (as detailed as possible)
• [C] In your view, how much do you think you should receive for each problem? Tell us, your thoughts.

Step:4 Staple the complaints sheet to the original of your assignment or term test and **HAND DELIVER it to the instructor** either during the class or during instructor’s office hours.
• Do NOT bring it to TA, because the re-marker may be different from the original marker.
• Do NOT submit to office assistants or anyone else other than the instructor, since it may be easily misplaced and may not reach the instructor.
• Do NOT leave it in any mail box.
• We strongly recommend that you make a photo-copy of the whole document prior to such submissions.
• **A remarking request may result in reduction in marks, or no change in marks, or an increase in marks.**

Step:5 Written responses will be given back to students, and if the student does not agree with the revised mark as well, then, the student may submit the **whole documentation**, including marker’s comments, to the instructor for arbitration.
• Students have **ONE (1) week** to lodge their arbitration request [One week after returning the re-marked papers during the tutorial period].
• Add additional comments explaining why you want to appeal the re-marking.
• Arbitration by the instructor may involve complete re-marking by the instructor, without any consideration of the previous marking and the resulting arguments.
• We strongly recommend that you make a photo-copy of the whole document prior to such submissions.
• **An arbitration request to the instructor may result in reduction in marks, or no change in marks, or an increase in marks.**