McMaster University  
Department of Civil Engineering

CIV ENG 3J04 Course Outline and Other Info-2018

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Note: Time allocations are approximate

REQUIRED BOOK:


HIGHLY RECOMMENDED TEXTBOOK

Important: Some lecture material and announcements may be posted on Avenue but not all material covered in lectures will be necessarily posted. It is the student’s responsibility to attend lectures and obtain the lecture material. Also, announcements may be made in class without posting on Avenue; it is the student’s responsibility to be aware of these announcements, whether posted on Avenue or made in class.

LABORATORY COMPONENT OF THE COURSE

In addition to lectures and tutorials, this course involves a laboratory exercise. The objective of this exercise is to observe the behavior and mode of failure of a reinforced concrete beam specimen tested in the ADL. The test beams for the various lab groups will be constructed and tested by the lab staff, assisted by the TA’s. A number of beams with different characteristics will be tested. Students will be divided into groups of 6-7 persons. Each group will observe the test of one beam and will make observations and take certain measurements during the test. At the end of the test, each student will
collect the data from the lab staff and analyze them by comparing the theoretical and actual behavior of the test specimens. Based on their observations and analysis, each group will prepare a final report. Each report will comprise a group part and individual parts. More details will be provided later about the content of the report.

**IMPORTANT:** It is absolutely essential that all members of the group obey the lab safety requirements, report on time to the lab, participate in the test, collect the test data and contribute to the lab report. Furthermore, every member must stay in the lab and actively participate for the entire duration of the test. *Lack of compliance with these requirements will result in failure of the lab work and the course cannot be completed without its lab component.*

**MARKING SCHEME:**
Quizzes = 15%, Lab. 10%, Midterm = 25% Final =50%

**MID-TERM AND FINAL EXAMS:**
Dates and timings to be determined. Both exams are closed-book. Allowed materials will be mentioned in class.

**Tutorials and Quizzes:**
In each tutorial there may be a quiz, which will cover the material in the assigned exercise problems of the preceding week tutorial. The quiz may be closed or open-book. Assignments will not be marked but the students will work on them during the tutorials. Solutions for quizzes will be posted after the quiz.

**TEACHING ASSISTANTS:**
The teaching assistants for this course are:

Nathan Buccella – buccelnj@mcmaster.ca
Mahmoud Madany – madanym@mcmaster.ca
Mohamed El-Seify - elsefym@mcmaster.ca

TA’s will post their office hours before the end of the second week of classes.

**COURSE OBJECTIVES:**
The primary objective of this course is to provide background materials to enable a student; [a] to understand the behavior of reinforced concrete structural members (beams, columns, beam-columns, continuous beams and one way slabs), and [b] to successfully design such simple reinforced concrete elements, satisfying strength and serviceability limit states in accordance with CSA-A23.3 "Design of Concrete Structures".

**LEARNING OUTCOMES:**
- Be able to describe major steps in design process, establish loads, understand uncertainties, and be able to establish design solutions. [Professionalism - Understands the role of the engineer in society, especially in protection of the public and public interest *(8.1)*. Investigation of the problems - Can estimate outcomes, uncertainties and determine appropriate data to collect *(3.3)*]
- Be able to describe the four stages of flexural behaviour of reinforced concrete members, and establish corresponding behaviour, including associated moment resistances and deflections. Be able to use
practical guidelines to establish feasible design solutions. [Design - Obtains experience with open-ended problems, Determines and employs applicable standards and codes of practice (4.3) (4.6)]

- Be able to recognize possible failure modes in reinforced concrete members, and be able to provide feasible design solutions to prevent undesirable failure modes (Anchorage, shear, deflections). [Problem analysis - Ability to obtain substantiated conclusions as a result of a problem solution including recognizing the limitations of the solutions. (2.3)]

- Be able to recognize the failure modes associated with concrete columns and beam-columns and establish corresponding capacities. Be able to establish design solutions for combined loads. [Investigation of the problems - Can estimate outcomes, uncertainties and determine appropriate data to collect (3.3), Determines and employs applicable standards and code of practice(4.6)]

SAFETY REQUIREMENTS AND INSTRUCTIONS

A. General Safety Guidelines

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 Environmental and Health Support Services Occupational Safety Risk Management Manual at: http://www.workingatmcmaster.ca/med/document/Lab-Safety-Handbook-1-36.pdf. It is also your responsibility to follow any specific Standard Operating Procedures (SOPs) provided for some of the experiments and the laboratory equipment.
- Contact lenses are not to be worn in the lab.
- No short (i.e., above the knee) pants or skirts are permitted in the lab – lab coats must be worn over top of your clothing in these instances.
- Closed-toe shoes must be worn at all times.
- No loose clothing allowed.
- Long hair must be tied back.
- Gloves must be worn when working with hazardous chemicals (as indicated by the laboratory instructor).

B. 3J04 Lab Specific Safety Requirements

To be able to participate in the lab, students and TA’s must wear:
- Safety glasses – McMaster will provide at the lab
- Hard hats – McMaster will provide at the lab
- Green patch closed-toe safety boots/shoes – student is responsible to acquire this
- Contact lenses are not to be worn in the lab.
- No short (i.e., above the knee) pants or skirts are permitted in the lab – lab coats must be worn over top of your clothing in these instances.
- No loose clothing allowed.
- Long hair must be tied back.
- Gloves must be worn when working with hazardous chemicals (as indicated by the laboratory instructor).
- Wearing work gloves recommended
Lab cannot be done without abiding by the above; there is no exception to this rule.

(a) No one shall create a situation that could compromise or jeopardize the safety of themselves or anyone else in the lab. Obey all instructions given to you by the Teaching Assistant and/or lab technical staff.

(b) In general, students are required to wear safety boots, hard hats, and safety eye-glasses at all times.

(c) These safety requirements are emphasized [1] through a pre-lab form which each student must fill and sign, [2] through lab work instruction sheets, and [2] instructor/TA/technicians check each student ensure they are wearing the above items.

Prior to each lab / each lab station students will be verbally reminded that they should wear the above safety equipments at all time, and in addition lab specific safety instructions (e.g. do not carry more than 20 kg, bend knees when lifting weights, etc.) will be given to students by the instructor/TA/technicians.

Failure to comply with safety rules, will result in the individual student being denied access to the lab and given a ‘did not complete’ grade for the lab session.

ACADEMIC 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/univsec/policy/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**.

3. **Copying or using unauthorized aids in tests and examinations**.