CIVE 4302 – Reinforced and Prestressed Concrete Design

Course Outline

(Fall 2024)

1. Instructor and Teaching Assistants

- **Instructor:** Vahid Sadeghian, PhD, PEng
  Email: Vahid.Sadeghian@Carleton.ca
  Office: 2035 Minto building

- **Instructor's Office hours:** TBA
- **Teaching Assistant:** TBA
- **TA Office hours:** TBA

2. Course Schedule

Class Type	Day	Time	Location
Lectures	Tuesday & Thursday	10:00 am – 11:25 am	
PA Session	Friday	8:35 am – 11:25 am	

Contact Academic Support if there is any conflict for this course schedule.

There will be no PA sessions for the first two weeks of classes.

3. Weekly Schedule (subjected to change)

Week	Topic
Week of Sept 2	General review of reinforced concrete - Part 1
Week of Sept 9	General review of reinforced concrete - Part 2
Week of Sept 16	Shear and torsion design - Part 1
Week of Sept 23	Shear and torsion design - Part 2
Week of Sept 30	Design of two-way slabs - Part 1
Week of Oct 7	Design of two-way slabs - Part 2
Week of Oct 14	Design of two-way slabs - Part 3
Week of Oct 21	Fall Break
Week of Oct 28	Design of slender columns
Week of Nov 4	Introduction to prestressed concrete
Week of Nov 11	Determination of prestress losses
Week of Nov 18	Flexural analysis and design
Week of Nov 25	Shear analysis and design
Week of Dec 2	Anchorage zone design

Note: all lectures and PA sessions will be in-person.

4. Objectives and Learning Outcomes

Upon successful completion of this course, students will be able to:

- ✓ Design reinforced concrete beams and columns under complex loading conditions (shear and torsion)
- ✓ Analyze and design two-way reinforced concrete slabs
- ✓ Assess loads on a slender column and design the slender column based on the applied loading
- ✓ Understand the concept of prestressed concrete and design prestressed beams
- ✓ Examine the long-term loading effects on prestressed beams and explain how these effects result in prestressing losses in the member behaviour

5. Course Delivery

This course will be taught in-person during the lecture times. Lecture slides for each week will be posted in advance. Students are advised to review the slides, read the corresponding code clauses, and attempt the lecture examples before attending the lecture. Doing this allows the lecture time to have more discussion about different aspects of the lecture content.

Once the lecture concludes, students are advised to complete the online lecture quiz to ensure that they clearly understood the conceptual and theoretical components of the lecture. And finally, assignments are designed to be a good practice of the practical components of the lecture

6. Textbook

It is necessary that all students own a copy of the Concrete design handbook 4th edition. **All assessment will be open book using this design manual and students own course notes only.** It is not available at the university bookstore. You must get a copy on your own from the Cement Association of Canada. To purchase the book please visit https://cement.ca/expertise_center/specification-or-guideline/concrete-design-handbook/.

7. Evaluation Method

Type	Percentage
Lecture quizzes	5% (Bonus)
Assignments	25%
Midterm exam	25%
Final exam	50%

- **Lecture quizzes**

A lecture quiz will be used weekly to assess the level of understanding attained from the lectures. The quizzes have two main purposes: a) ensure an adequate level of understanding is attained from the lecture, and b) they act as a from of formative assessment that allows me to address common mistakes and questions. Therefore, it is imperative for students to attempt the quizzes on their own in order for me to be able to adequately prepare and address issues of concern during the lecture time.

- **Assignments**

At the end of each topic, an assignment will be posted on Brightspace. Assignments should be completed individually and **submitted on paper** at the beginning of the class before the start of the lecture. **There will be a 10% penalty per day for late submission of the assignment.** It is okay to discuss the assignment with colleagues to enhance understanding, but attempting assignments individually is the only way to have an opportunity to test your understanding and practice for the midterm and final exam.

- **Exams**

The midterm exam will take place during one of the PA sessions after the fall break. If you cannot attend the exam you need to inform the instructor before the exam date. Missing the exam will automatically result in a zero mark unless acceptable documentation is presented to justify your absence before the date of the test. The instructor will decide what documentations are acceptable. If your document is not acceptable you will receive a zero mark for the exam.

The final exam has not yet been scheduled. You will be notified of the date, time and location through the university once SES makes the exam schedule available.

Both midterm and final exams are open book where students are allowed to use the handbook, lecture notes, and their own notes. Electronic devices are not allowed, if you need lecture notes you can print the relevant ones.

Appeals: All appeal of grades assigned in this course must be made within 7 calendar days of the grade being made available. Appeals of grade can result in either a reduction or an increase in grade.

8. Copyright

9. Academic Regulations, Policies and Support Services

The following electronic resources provide information on academic regulations, policy and support services:

9.1 Regulations

- http://calendar.carleton.ca/undergrad/regulations/academicregulationsandrequirementsforthebachelorofengineeringdegree/
- https://carleton.ca/cee/current-students/current-undergraduate-students/

9.2 Student Rights and Responsibilities

https://carleton.ca/studentaffairs/student-rights-and-responsibilities/

9.3 Academic Support Services

https://carleton.ca/academics/support/

10. Academic Accommodation

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). Requests made within two weeks will be reviewed on a case-by-case basis. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (if applicable).