Concordia University

Faculty of Engineering and Computer Science

Department of Building, Civil, and Environmental Engineering

BCEE 345/4-L&V **Structural Design II** **Winter 2018**

Instructor:

Instructor	Office	E-Mail	Telephone	Office Hours
Dr. L. Lin	EV-6.245	lan.lin@concordia.ca	Ext. 3032	F 3:00-4:00 pm
Dr. F. Gani	EV-6.209	fgani@encs.concordia.ca	Ext. 7812	F: 1:15 to 2:30 pm

Time & Location:

Lecture	Day	Time	Location
Session L (Dr. Lin)	W & F	11:45 am – 1:00 pm	H-435
Session V (Dr. Gani)	W & F	11:45 am – 1:00 pm	H-820

Tutorial	Teaching Assistant	E-Mail	Day	Time	Location
Tut LI	Mr. Bashar Hariri	bashar.hariri@mail.concordia.ca	Th	9:45-11:35am	H-564
Tut LJ	Mr. Bashar Hariri	bashar.hariri@mail.concordia.ca	M	7:15-9:05pm	H-540
Tut VI	Hamid Arabzadeh	arabzadehhamid@gmail.com	W	9:45-11:35am	H-537
Tut VJ	Hamid Arabzadeh	arabzadehhamid@gmail.com	Tu	6:00- 7:50pm	H-562

Prerequisite:

BCEE 342 “Structural Analysis I”

Course Objective:

The main objective of the course is to introduce the students to the techniques required by practicing engineers for designing reinforced concrete structures using the Canadian codes A23.3-14 and NBCC-15. The approach used is to review the behaviour and mechanics of reinforced concrete elements subjected to a variety of loading conditions. The structural elements covered are beams, columns, one-way slabs, spread and strip footings.

Textbooks:

1. "Reinforced Concrete Design: A Practical Approach" 3rd Ed. (2017) by S. Brzev and J. Pao.
2. "Concrete Design Handbook" 4th Ed. (2016), Canadian Portland Cement Association, CPCA. The handbook includes the CSA Standard A23.3-14.

References:

1. "National Building Code of Canada" NBCC 2015: Part 4 Structural Design.
2. Course notes and handouts.

Course Evaluation:

The course will be graded on the following basis:

- Assignments 10%
- Mid-term exam 20% (March 7, 2018)
- Final exam 70%

Assignments:

The assignments should be submitted at the beginning of the lecture time on the due date.

Tutorials:

Students should try and solve the assigned problems before the tutorials, and then discuss the difficulties during the tutorial time.

Materials Allowed:

In the mid-term and final exams, students are allowed to

- Use an unmarked copy of the design standard CSA A23.3-14, i.e. Part I of the "Concrete Design Handbook", the rest of the handbook should not be used,
- One side letter size (8.5"x11") notes, hand written or electronically prepared, can include sketches, equations, calculation steps and must not contain worked examples and no glued parts.

Course Content:

- Introduction and Design Process
- Materials and Loads
- Flexure: Behaviour of Beams
- Serviceability
- Flexure: Design of Beams
- Shear Design of Beams
- Bond and Anchorage of Reinforcement

- Columns
- Continuous Beams and One-Way Slabs
- Footing Design

Use of Computer:

A structural analysis program SAFI is available to help students comparing answers for assignments and to study further the course material. This program is installed in computers of rooms H-819, H-823, H-837 and H-841. ENCS username and password are required to have access to the computers. Instructions on how to use the program will be given accordingly during the lecture whenever is deemed necessary. Guidelines on how to use the program will also be posted on Moodle.

CEAB Graduate Attributes:

This course emphasizes and develops the following CEAB Graduate Attributes and Indicators:

Graduate Attribute	Indicator	Level of Knowledge	CLO	Evaluation Method
Design: An ability to design solutions for complex, open-ended engineering problems and to design systems, components or processes that meet specified needs with appropriate attention to health and safety risks, applicable standards, and economic, environmental, cultural and societal considerations.	DE-1: Define the objective DE-2: Idea generation and selection DE-3: Detailed design DE-4: Validation and implementation	Intermediate Intermediate Introductory Intermediate	1 2 4 3	Assignments, Midterm and Final Exam
Life-long learning: An ability to identify and to address their own educational needs in a changing world, sufficiently to maintain their competence and contribute to the advancement of knowledge.	LL-2 Continuous improvement and self-learning	Intermediate	5	Assignments, Midterm and Final Exam

Disclaimer:

"In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change."