EXPANDED COURSE DESCRIPTION
CIVIL ENGINEERING
Lassonde School of Engineering
Civil Engineering
LE / CIVL 3230 4.0 SECTION M
INTRODUCTION TO STRUCTURAL DESIGN
FALL 2019 / WINTER 2020

Last Modified Date: 08/07/2019

COURSE CALENDAR DESCRIPTION
Provides a review of: basic structural systems, including gravity and lateral load-resisting systems; principles of Limit States Design according to the National Building Code (NBC) of Canada; and dead and live loads, snow and rain loads, and loads due to wind based on the NBC. Properties of structural steel and reinforced concrete will be discussed. Design of structural steel including tension members, compression members, beams, and connections will be based on CSA S16. Design of reinforced concrete according to CSA A23.3 will include: beams in flexural and shear; and columns under axial load, and combined axial load and bending. Prerequisites: LE/CIVL 2120 3.00; LE/CIVL 3130 3.00.

INSTRUCTOR(S)

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<tr>
<th>Name</th>
<th>Section / Format / Term</th>
<th>Contact Email</th>
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<tr>
<td>Butler, Liam J</td>
<td>Sec. M / LECT / W</td>
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ADDITIONAL INFORMATION

TOPICS AND CONCEPTS
Part 1: Design Concepts and Material Properties
  • Introduction to Limit States Design
  • Calculations of service and design loads according to the National Building Code of Canada: dead, live, wind, snow and associated rain, and earthquake loads
  • Review of physical and mechanical materials properties of concrete and steel

Part 2: Reinforced Concrete Design
  • Flexural behavior of rectangular reinforced concrete beams
  • Flexural design of reinforced concrete beams
  • Shear behavior and design of reinforced concrete beams
  • Behavior and design of compression members under combined axial and flexural loading

Part 3: Structural Steel Design
  • Behavior and design of tension members
  • Behavior and design of compression members
  • Behavior and design of flexural members
  • Welded and bolted connections

COURSE LEARNING OUTCOMES
Upon the completion of this course, students are expected to learn and retain the following concepts and skills:
1. Understand the principles of Limit States Design
2. Be able to calculate service and design loads acting on buildings in accordance with the National Building Code of Canada
3. Understand the mechanical properties of reinforced concrete and structural steel member behavior
4. Perform sectional design of reinforced concrete and structural steel members according to the current CSA Standards
5. Prepare, batch, mix and cast concrete mixes for use in the construction of scaled models of reinforced concrete beams
6. Interpret laboratory data from testing of civil engineering materials according to material testing standards, and from testing reinforced concrete and steel beam specimens in the lab
7. Present information using engineering charts, tables, graphs and diagrams within laboratory reports

EVALUATION SCHEME
Assignments, quizzes and lab reports - 30%
Midterm examination - 30%
Final examination - 40%

REQUIRED READINGS
Handbook of Steel Construction, CISC, 12th Edition

SUGGESTED READINGS

ADDITIONAL INFORMATION
Laboratory Experience
The laboratory experience provides students with the unique hands-on experience of manufacturing and testing of scaled down structural elements. The main tasks will involve the fabrication of reinforced concrete beams and testing of reinforced concrete and structural steel beams to demonstrate the response of these beams under loading.

ACADEMIC INTEGRITY LINKS
• Senate Policy on Academic Honesty - http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/
• Academic Integrity - http://lassonde.yorku.ca/academic-integrity

STUDENT LINKS
• Student Rights and Responsibilities - http://oscr.students.uit.yorku.ca/student-conduct
• Religious Observance - https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs
• Academic Accommodation for Students with Disabilities - http://secretariat-policies.info.yorku.ca/policies/academic-accommodation-for-students-with-disabilities-policy/
• Student Accessibility Services (SAS) - https://accessibility.students.yorku.ca/
• York University’s Policies on Sexual Violence - http://secretariat-policies.info.yorku.ca/policies/sexual-violence-policy-on/
• York University’s Policies on Gender/LGBTQ*/Positive Space - http://rights.info.yorku.ca/lgbtq/

LAND ACKNOWLEDGEMENT
• We acknowledge our presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, the Huron-Wendat, and the Métis. It is now home to many Indigenous Peoples. We acknowledge the current treaty holders, the Mississaugas of the New Credit First Nation. This territory is subject of the Dish With One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.
• The Indigenous Framework for York University: A Guide to Action can be found here: http://indigenous.info.yorku.ca/
• Meaning of a land acknowledgement: http://healthydebate.ca/opinions/indigenous-land-acknowledgements
Many courses utilize Moodle, York University's course website system. If your course is using Moodle, click here to access it. 
Moodle @ York University