

EVDA 619 – Structures for Architects II

COURSE OUTLINE

Winter 2015

Course Hours and Location:	Tuesday	11:00 – 12:20 (Room PF-3160)
	Thursday	11:00 – 12:20 (Room PF-3160)
Instructor:	Gary Mundy	(403) 283-7796 gary.mundy@gecarchitecture.com
Teaching Assistant:	Sophia Yi	(403) 464-7654 layi@ucalgary.ca

Introduction

The purpose of this course is to present the basic principles of structural behaviour, emphasize the fundamental prerequisites for structural adequacy, and develop an understanding of rudimentary analysis and design procedures. A working understanding of structural analysis and design will be built on the qualitative understanding developed in Structures I and augmented through integration into students' comprehensive studio projects. Students are expected to gain a basic understanding of the technical design process as well as develop a more advanced intuitive sense for structural adequacy. The Architect's role in the selection and coordination of structural systems will be reviewed in detail, including discussion around the coordination of structures with other building systems such as building envelope, mechanical, and electrical systems.

Objectives

1. To learn about structures and the physical principles which govern their behaviour.
2. To establish an understanding of how loads flow through a structure and the fundamental means of supporting them.
3. To develop quantitative analysis and design procedures for basic structural elements.
4. To develop a vocabulary for communicating and understanding the structural elements frequently used in architectural design.
5. To understand the Architect's role as prime / coordinating consultant in the context of structural design.

Teaching Methodology

This course is divided into two major portions: half will include lectures and assignments intended to develop the technical skills used in conceptualizing and sizing structural systems, and half will focus on the integration, coordination, and symbiosis of structure into the architectural design concept. Material will be presented through lectures, discussions, assignments, and critiques.

Course Content

- 1 Structural Systems**
 - a. Recap of Structural Element Types
 - b. Recap of System Characteristics
 - c. System Selection and Preliminary Coordination

- 2 Structural Analysis**
 - a. Forces and Loads
 - b. Statics
 - c. Internal Stress Diagrams
 - d. Load Path Determination

- 3 Structural Design**
 - a. Beam Design
 - b. Column Design

- 4 Structural Integration**
 - a. Primary, Secondary, Tertiary, etc. Structure
 - b. Integration into Architectural Designs
 - c. Detailed Design and Coordination

Evaluation

The course evaluation will be based on the assignments completed during the term. There will be no final examination. Assignments will be judged upon:

- Accuracy of solutions.
- Responsiveness and relevance to specifics of assignment.
- Clarity of physical and textual presentation.
- Clarity of analysis.
- Quality of integration of structural system within design (assignments 6&7).
- Overall quality of work.

Note: A passing grade in assignments 6 & 7 is required in order to pass the course as a whole.

Late assignments without prior approval will be penalized at -5% per day late.

Course assignments will be weighted as follows:

Assignment	Topic	Percent of Total Grade
1	Bridge Design	10
2	Statics	10
3	Shear and Moment	10
4	Beam Sizing	10
5	Column Sizing	10
6	Primary System Design	25
7	Design Integration	25
Total		100

CACB Student Performance Criteria

The following Student Performance Criteria will be covered in this course at a primary level: B7 Structural Systems; C1 Detailed Design Development; C2 Building Systems Integration. (See CACB Student Performance Criteria Matrix for further details).

The following Student Performance Criteria will be covered in this course at a secondary level: B1 Design Skills; B6 Life Safety Systems, Building Codes and Standards; B11 Building Materials and Assemblies; B12 Building Economies and Cost Control; C3 Technical Documentation; C4 Comprehensive Design. (See CACB Student Performance Criteria Matrix for further details).

Grading Scheme

A+	95-100%	B+	80-84.99%	C+	65-69.99%	D+	50-54.99%
A	90-94.99%	B	75-79.99%	C	60-64.99%	D	45-49.99%
A-	85-89.99%	B-	70-74.99%	C-	55-59.99%	F	0-44.99%

Recommended Reading

Millais, Malcolm	<u>Building Structures: From Concepts to Design</u> ; Spon Press, Taylor & Francis Group: 2005, ISBN: 0415336236
Ching, Francis D.K.	<u>Buiding Structures Illustrated</u> ; Wiley Trade Publishing, 2009, ISBN: 9780470187852
Salvadori, Mario	<u>Why Buildings Stand Up</u> ; W. W. Norton, 2002, ISBN: 0393306763
Gordon, J.E.	<u>Structures, or Why Things Don't Fall Down</u> ; Penguin Books, 1991, ISBN: 0140136282

Notes

1. Written work, term assignments and other course related work may only be submitted by e-mail if prior permission to do so has been obtained from the course instructor.
2. It is the student's responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at 403-220-8237 (<http://www.ucalgary.ca/drc/node/46>). Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than fourteen (14) days after the start of this course.
3. Plagiarism - Plagiarism involves submitting or presenting work in a course as if it were the student's own work done expressly for that particular course when, in fact, it is not. Most commonly plagiarism exists when:(a) the work submitted or presented was done, in whole or in part, by an individual other than the one submitting or presenting the work (this includes having another impersonate the student or otherwise substituting the work of another for one's own in an examination or test),(b) parts of the work are taken from another source without reference to the original author,(c) the whole work (e.g., an essay) is copied from another source, and/or,(d) a student submits or presents work in one course which has also been submitted in another course(although it may be completely original with that student) without the knowledge of or prior agreement of the instructor involved. While it is recognized that scholarly work often involves reference to the ideas, data and conclusions of other scholars, intellectual honesty requires that such references be explicitly and clearly noted. Plagiarism is an extremely serious academic offence. It is recognized that clause (d) does not prevent a graduate student incorporating work previously done by him or her in a thesis. Any suspicion of plagiarism will be reported to the Dean, and dealt with as per the regulations in the University of Calgary Graduate Calendar.
4. Information regarding the Freedom of Information and Protection of Privacy Act and how this impacts the receipt and delivery of course material (<http://www.ucalgary.ca/secretariat/privacy>)
5. Emergency Evacuation/Assembly Points (<http://www.ucalgary.ca/emergencyplan/assemblypoints>)
6. Safewalk Information (<http://www.ucalgary.ca/security/safewalk>)
7. Contact Info for: Student Union (<http://www.su.ucalgary.ca/page/affordability-accessibility/su-structure/contact-info>); Graduate Student Representative (<http://www.ucalgary.ca/gsa/>) and Student Ombudsman's Office (<http://www.su.ucalgary.ca/page/quality-education/academic-services/student-rights>).