



EVDA 619 H (3-0): Structures for Architects 2

Winter 2020

Classes: 09:00 am – 12:10 pm Fridays
Room: PF 2160

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CACB student performance criteria (SPCs) met by the course:
Primary: B7 - Structural Systems, B11 - Building Materials and Assemblies
Secondary: B1 - Design Skills

Course Information

This course explores different structural systems and materials commonly used in contemporary architecture. The course revisits some of the structural principles learned in Structures for Architects 1 and provides students with the analytical tools to evaluate the system's characteristics, behavior, and specific physical requirements. This course is part of the EVDS building technology sequence and it is designed to support Comprehensive Building Design Studios.

Course Learning Outcomes

By the end of the course, the students should be able to:

- Understand structures as an integral part of any architectural project.
- Identify structural and non-structural components of buildings, their specific roles and physical requirements.
- Develop the ability to evaluate and determine the appropriateness of structural systems and materials.
- Interpret the different loads applied to a structure.
- Describe the factors affecting the choice of structural system in a project.

Teaching Approach

The course is divided into two broad areas: Structural Analysis and Structural Design. Individual course topics are presented mainly through lectures. Weekly required readings, assignments, discussions of student work, and videos supplement the material presented in lectures.

Content:

Lectures	Lab
9:10 am - 10:00 am	10:15 am - 12:20 pm
Week 1 – January 10th: Course Introduction. Structural Systems.	Exercise Introduction
Week 2 – January 17th: Digital Structural Analysis Tools.	Visual Basic Exercise
Week 3 – January 24th: Ground. Foundations. Retaining Walls.	Desk-crits (8-10 groups)
Week 4 – January 31st: Reinforced Concrete Structures.	Desk-crits (8-10 groups)
Week 5 – February 7th: Solid Armature. Monolithic Structures. Surface Active Structures.	Desk-crits (8-10 groups)
Week 6 – February 14th: Steel Structures	Desk-crits (8-10 groups)
Week 6 – February 21th: No class – Reading Week.	No class
Week 7 – February 28th: Open Armature. Vector Active Structures. Trusses. Section Active Structures.	Mock-up Model Review
Week 8 – March 6th: Wood Structures	Desk-crits (8-10 groups) Ground and Foundations Due
Week 8 – March 13th: No class – Block Week	No class
Week 9 – March 20th: Filigree Structures. Light Wood Framing	Desk-crits (8-10 groups) Primary Structural Members Due
Week 10 – March 27th: High-Active Structures.	Desk-crits (8-10 groups) Secondary Structural Members Due
Week 11- April 3th: Final Model Review	
Week 12 - April 10th: Final Exam	

Means of Evaluation

Students will be evaluated through a group project (40%), weekly quizzes on lectures (30%), a final exam (30%). Quizzes and exams are closed book; however, 1 page of notes (front and back) is allowed. Quizzes must be completed in the first 15 minutes of lecture class. Therefore, attendance to lecture is required. Absences will not count towards administrative fail but students are responsible for any missed work. Missed quizzes and exams due to un-excused absences will receive no credit.

Grading Scale

Final grades will be reported as letter grades, with the final grade calculated according to the 4-point range.

Grade	Grade Point Value	4-Point Range	Percent	Description
A+	4.00	4.00	95-100	Outstanding - evaluated by instructor
A	4.00	3.85-4.00	90-94.99	Excellent - superior performance showing comprehensive understanding of the subject matter
A-	3.70	3.50-3.84	85-89.99	Very good performance
B+	3.30	3.15-3.49	80-84.99	Good performance
B	3.00	2.85-3.14	75-79.99	Satisfactory performance
B-	2.70	2.50-2.84	70-74.99	Minimum pass for students in the Faculty of Graduate Studies
C+	2.30	2.15-2.49	65-69.99	All final grades below B- are indicative of failure at the graduate level and cannot be counted toward Faculty of Graduate Studies course requirements.
C	2.00	1.85-2.14	60-64.99	
C-	1.70	1.50-1.84	55-59.99	
D+	1.30	1.15-1.49	50-54.99	
D	1.00	0.50-1.14	45-49.99	
F	0.00	0-0.49	0-44.99	

Notes:

- A student who receives a "B-" or lower in any one course will be required to withdraw regardless of their grade point average (GPA) unless the program recommends otherwise. If the program permits the student to retake a failed course, the second grade will replace the initial grade in the calculation of the GPA, and both grades will appear on the transcript.

Recommended textbooks:

-Ching, Francis D.K., Onouye, B. S., & Zuberbuhler, D., Building Structures Illustrated, Patterns, Systems, and Design, (2009, John Wiley & Sons, Hoboken, New Jersey)

Other Recommended textbooks:

- Allen, Edward & Iano, Joseph, The Architect's Studio Companion, (2001, John Wiley & Sons, NY)
- Allen, Edward & Iano, Joseph, Fundamentals of Building Construction, (2003, John Wiley & Sons, NY)
- Ambrose, James, Building Structures, (1993, John Wiley & Sons, New York)
- Billington, David, The Tower & The Bridge, (1983, Princeton University Press, New Jersey)
- Ching, Francis D.K., Building Construction Illustrated, (1991, Van Nostrand Reinhold, New York)
- Deplazes, Andrea, Constructing Architecture, Materials Processes Structures, (2005, Birkhauser-Publishers, Basel, Boston, London)
- Engel, Heino, Structure Systems, (1997, Distributed Art Publishers, New York)
- Otto, Frei, & Rasch, Bodo, Finding Form, (1995, Edition Axel Menges)

- Salvadori, Mario, *Why Buildings Stand Up*, (2002, W. W. Norton & Co., New York)
- Salvadori, Mario, *Why Buildings Fall Down*, (2002, W. W. Norton & Co., New York)
- Schueller, Wolfgang., *The Design of Building Structures*, (1995, Prentice Hall, New Jersey)
- Wolfe, William S., *Graphical Analysis*, a text book on Graphic Statics, (1921, McGraw-Hill, NY)
- Zalewski, Waclaw & Allen, Edward, *Shaping Structures Statics*, (1998, John Wiley & Sons, NY)
- Canadian Wood Council, *Wood Reference Handbook*, (1991, Canadian Wood Council, Ontario, Canada)
- DETAIL, *Review of Architecture, Glass Construction Manual*, (1999, Birkhauser, Basel, Switzerland)
- DETAIL, *Review of Architecture, Steel Construction Manual*, (2000, Birkhauser, Basel, Switzerland)

Course Website

DLS will be utilized as the primary communication tool for this course. The course website will contain updated information regarding both project and homework assignments as well as required and recommended readings and references. It is the responsibility of students to ensure that they are registered for the course and that their e-mail contact information is up-to-date with the university.

Special Budgetary Requirements

There are no special budgetary requirements for this course.

Notes on Media and Recording in Learning Environments

Part 1

University Calendar: <https://www.ucalgary.ca/pubs/calendar/current/e-6.html>

Recording of lectures (other than audio recordings that are pre-arranged as part of an authorized accommodation) is not permitted.

Students may not record any portion of a lecture, class discussion or course-related learning activity without the prior and explicit written permission of the course instructor or authorization from Student Accessibility Services. For any other use, whether by duplication, transcription, publication, sale or transfer of recordings, written approval must be obtained from the instructor for the specific use proposed. Any use other than that described above constitutes academic misconduct and may result in suspension or expulsion.

Part 2

The instructor may use media recordings to capture the delivery of a lecture.

The instructor will notify all students and guests in the class that the event is being recorded. If a student or guest wants to take steps to protect privacy, and does not want to be recorded, the instructor will provide the individual (s) with an alternative means of participating and asking questions (e.g., passing written notes with questions). Students cannot be penalized for choosing not to be recorded in situations where participation is part of the course. Students must be offered other ways of earning participation credit that do not involve recording.

Any video-recording would be intended to only capture the instructor and the front of the classroom. Students/other participants would not necessarily be visible on video recordings.

University of Calgary Policies and Supports

ACADEMIC ACCOMMODATION

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/. Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at <http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf>.

ACADEMIC MISCONDUCT

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, (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. Any suspicion of plagiarism will be reported to the Dean, and dealt with as per the regulations in the University of Calgary Graduate Calendar.

For information on academic misconduct and its consequences, please see the University of Calgary Calendar at <http://www.ucalgary.ca/pubs/calendar/current/k.html>

COPYRIGHT LEGISLATION:

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf) and requirements of the copyright act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorised sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary.

UNIVERSITY STUDENT APPEALS OFFICE:

If a student has a concern about the course, academic matter, or a grade that they have been assigned, they must first communicate this concern with the instructor. If the concern cannot be resolved with the instructor, the student can proceed with an academic appeal, which normally begins with the Faculty. <https://ucalgary.ca/student-appeals/>

More student support and resources (e.g. safety and wellness) can be found here:

<https://www.ucalgary.ca/registrar/registration/course-outlines>