

Structure for Architects I

EVDA 613 H (3-0)

Fall 2013

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Introduction

This course introduces fundamentals of structural analysis, terminology and notation used in structural analysis, idealization of structural components and loads coming into the structure. The course also introduces materials used in structures, different structural system and factors affecting choices of the materials and structural system. The course takes qualitative approach in introducing the fundamentals of structural analysis and prepares the students for basic analysis and design calculations in the next course.

Objectives

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

- identify and describe structural and non-structural components of buildings
- interpret different loads applied to the structure
- interpret structural components and loads in basic structures using free body diagrams
- describe different structural systems and factors affecting choice of structural system
- apply conceptual structural system for simple buildings

Teaching Approach

The course is divided into topic areas which are presented with conceptual frameworks, case studies and practical examples. The topics are covered using interactive lectures, class-room discussion, field visits, case studies and assignments. **Attendance at site visits is mandatory.** The assignments provide the students opportunity to enhance independent learning, apply critical thinking and make decisions. Assignments do not cover entire material covered in the course.

Content: Topic Areas & Detailed Class Schedule

1. Week 1,2,3

Overview of Structural System

Structural and non-structural components

Structural elements

Structural Materials

2. Week 4, 5, 7

Loading and Equilibrium

Loads in buildings

Free-body diagram

Support, reactions and equilibrium

3. Week 8,9,10

System choices

Load path, redundancy

Factors affecting system choice

Factors affecting material choice

Structural patterns

4. Week 11,12, 13

System integration

Ways of integration

Attitude towards integration

Field visits (Attendance is mandatory):

Sept 26: Open House hosted by Lafarge at precast production facility (12:00 – 14:00). Time and details are subject to change and any changes will be posted in blackboard.

Others: TBD

Means of Evaluation

The course evaluation will be based on the assignments completed during the term, which includes written assignments, presentation of work and facilitating discussions. There will be no final examination.

Assignment 1: Precedent Analysis	25 %
Assigned	Sept 16
Collected	Sept 30
Assignment 2: Loading and Equilibrium	25 %
Assigned	Sept 30
Collected	Oct 28
Assignment 3: Conceptual Structural framework for Studio	25 %
Assigned	Oct 21
Collected	Nov 20
Assignment 4: Structural systems	25 %
Assigned	Nov 13
Collected	Dec 04
Total	100%

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	92.5-100	Outstanding - evaluated by instructor
A	4.00	3.85-4.00	85-92.49	Excellent - superior performance showing comprehensive understanding of the subject matter
A-	3.70	3.50-3.84	80-84.99	Very good performance
B+	3.30	3.15-3.49	76-79.99	Good performance
B	3.00	2.85-3.14	73-75.99	Satisfactory performance
B-	2.70	2.50-2.84	70-72.99	Minimum pass for students in the Faculty of Graduate Studies
C+	2.30	2.15-2.49	66-69.99	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	63-65.99	
C-	1.70	1.50-1.84	60-62.99	
D+	1.30	1.15-1.49	56-59.99	
D	1.00	0.50-1.14	50-55.99	
F	0.00	0-0.49	0-49.99	

Notes:

- A student who receives a "C+" 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.

List of books

Required

Building Structures Illustrated: Patterns, Systems, and Design

Francis D. K. Ching, Barry S. Onouye, Douglas Zuberbuhler (2008) John Wiley & Sons

ISBN: 978-0470187852

References

Building Construction Illustrated, 4th edition

Francis D. K. Ching (2008), John Wiley & Sons

ISBN: 978-0470087817

The Architect's Studio Companion: Rules of Thumb for Preliminary Design, 5th edition

Edward Allen, Joseph Iano (2011), Wiley

ISBN: 978-0470641910

Why Buildings Stand Up

Mario Salvadori (2002), W. W. Norton & Company

ISBN: 978-0393306767

Special Budgetary Requirements – please include these in the course outline.

Special budgetary requirements are limited to the optional purchase of course readings and, in specific courses, mandatory supplementary fees to cover certain expenditures, such as field trips. Mandatory supplementary fees must be approved by the University prior to implementation.

Optional:

For certain courses students may be given the option of purchasing course readings. In these cases the cost of the reading package should be stated in the course outline. When course readings are available for purchase, a minimum of two copies of the readings must be made available in the EVDS Resource Centre.

Mandatory:

The University has approved supplemental fees for the following courses:

2013/2014 SUPPLEMENTARY COURSE FEES

ARST 484/EVDA 580/EVDS 603 - Studio I Design Thinking	\$92.00
ARST 444/EVDA 582 - Studio II in Architecture	\$92.00
EVDA 682.02 – Intermediate Studio	\$92.00
EVDA 682.04 - Comprehensive Arch. Studio	\$92.00
EVDA 782 - Senior Arch. Studio (all sections)	\$92.00
EVDS 624 – Impact Assessment and Risk Management	\$35.00
EVDS 626 – Landscape Planning and Ecological Design	\$70.00

CACB Student Performance Criteria (for architecture courses only):

Example: "The following CACB Student Performance Criteria will be covered in this course at a primary level (other criteria will be covered at a secondary level): B1: Design Skills; B2: Program Preparation; B3: Site Design; B7: Structural Systems; C1: Detailed Design Development."
(see SPC matrix)

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. Submissions must come from an official University of Calgary (ucalgary) email account.
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 Student Accessibility Services, please contact their office at 220-8237. (<http://www.ucalgary.ca/access>) Students who have not registered with the Student Accessibility Services 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 (<http://www.ucalgary.ca/secretariat/privacy>) and how this impacts the receipt and delivery of course material
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/contact>); 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>).

Summary:

Course Outlines - EVDS Requirements

Except for Directed Studies there shall be an official Faculty outline prepared for each and every course offered and made available to students. An outline shall describe:

- (a) Objectives, in terms of knowledge, skills and, where relevant, attitudes;
- (b) Content;
- (c) Teaching Approach;
- (d) Means of Evaluation; and
- (e) Special Budgetary Requirements
- (f) CACB Student Performance Criteria (if applicable)

The Course Manager shall ensure that this outline is adequately prepared before commencement of the course.

Course Outlines - University Requirements

see: <http://www.ucalgary.ca/pubs/calendar/current/e-1.html>

A course outline is intended to provide the overall structure and requirements of a course and inform students with respect to what they can expect in the course.

Each instructor responsible for a course is required to make a course outline available to each student no later than the first meeting date for the course. It is expected that the outline will be available as a web-based document or through the learning management system (i.e. Blackboard). If it is not, a paper version of the outline will be handed out to every student at the first meeting of the class, and made available for those unable to attend the first class.

In addition to the required general information (number and title of course, name of the instructor, day, place and time of regular classes, prerequisites/corequisites, etc.) each outline must contain the following:

- (a) Whether or not a passing grade on any particular component of a course is essential if the student is to pass the course as a whole;
- (b) Information on grading methods and/or scales used in the course;
- (c) Whether students in the course may be expected to participate as subjects or researchers when research on human subjects may take place;
- (d) Whether or not there will be a final examination and if an examination is held, whether the use of aids such as open book, etc. are permitted;
- (e) A list and description of approved optional and mandatory supplementary fees for courses;

(f) The weights to be assigned to the various components which are to be considered in determining the final grade (term papers, laboratory work, class participation, tests, final examinations, etc.). This weighting may not be changed during the term or at the time of grade reporting;

(g) When writing and the grading thereof is a factor in the evaluation of the student's work. (See E.2 Writing Across the Curriculum (<http://www.ucalgary.ca/pubs/calendar/current/e-2.html>) statement.)

(h) Academic Accommodation Policy (Student Accessibility Services);

(i) Information regarding the [Freedom of Information and Protection of Privacy Act](http://www.ucalgary.ca/legalservices/foip/) (<http://www.ucalgary.ca/legalservices/foip/>) and how this impacts the receipt and delivery of course material;

(j) Information on academic misconduct and the consequences thereof;

(k) Emergency Evacuation/Assembly Points

(<http://www.ucalgary.ca/emergencyplan/assemblypoints>);

(l) Internet and Electronic Communication Device information;

Instructors will also indicate in the course outline the use of calculators and/or computers that will be allowed. In the absence of a written statement, the presumption is that the use of any calculators and/or computers during examinations will not be allowed.

Instructors have the authority, at the discretion of the dean of their faculty, to require that specific course assignments, term papers and academic exercises be submitted in an electronic format.

Instructors cannot require that multiple copies of an assignment be submitted.