



Course Number	ARCH 612	Classroom	ZOOM
Course Name	Building Science and Technology II		
Pre/Co-Requisites			
Instructor	Christopher Roberts	Office Hours/Location	By Appointment
	Email: carobert@ucalgary.ca	Phone: 403 220-9233	
Class Dates	Mandatory real-time Zoom classes: Mondays and Wednesdays 11:00 am to 12:30 pm		
Instructor Email Policy	Please note that all course communications must occur through your @ucalgary email, and I will respond to emails sent via student's @ucalgary emails within 48 hours.		
Name and Email of Teaching Assistant(s)	Thomas Acheson (tacheson@ucalgary.ca) Faraz Shapourzadeh (faraz.shapourzadeh@ucalgary.ca)		

Course Description

This course explores:

Application of building science theory to building enclosure, examination of building elements and the application of building components to specific problems in architecture. This course focuses on the application of building science principles to building structures and enclosures. It examines various types of building elements in manners appropriate to their intended functions and performances. The understanding of building enclosures requires a familiarity with individual components that make up the total structure. Each component interacts and interrelates with one another. This course examines the function and configuration of building components from footings to wall and roofing systems

Course Hours:

Online Delivery

This course will take place **online** via Desire2Learn (D2L) and Zoom. Students are required to participate in the asynchronous learning tasks using the D2L learning environment and synchronous Zoom sessions. If unable to participate live due to unforeseen circumstances, inform the instructor in advance to work out an alternative participation activity (e.g., watch the recordings, submit a brief reflection, and actively contribute to the follow-up online discussion).

Course Learning Outcomes

Upon completion of this course, students will know and be able to:

1. To develop a sound understanding of building envelope components and their influence on building performance, design intent and sustainability.
2. To develop an understanding of the building process from soils investigation and foundation design to the design and execution of building enclosure systems.
3. To become familiar with the basic requirements of the National and Alberta Building Code that most impact design including rules for exiting, handicap accessibility, fire ratings and separations.
4. To acquire necessary skills to read, design and illustrate certain architectural details as an effective means of communication.

Learning Resources

For this course, most required study material will be provided by the Instructor. It is suggested that students become familiar with the following:

National Research Council

NRC Electronic National Construction Codes and Guides provides free download of 2019 Alberta Building Code (2019 ABC) and 2017 National Energy Code for Buildings (2017 NECB) @ www.nrc.canada.ca

Canadian Building Digest, Institute for Research in Construction, National Research Council of Canada @ www.nrc.ca/irc/cbd

AAA Website, Continuing Education, CMHC & OAA Articles @ www.aaa.ab.ca

High Performance Enclosures, publication by John Straube

Building Construction Illustrated, publication by Francis Cheng

Building Science Consultants

Building Science Corporation @ www.buildingscience.com

RDH Building Science Inc. @ www.rdh.com

Morrison Hershfield, Insights, Building Envelope Thermal Bridging Guide @ www.morrisonhershfield.com

Building Envelope water/air/vapour membrane suppliers

Soprema Build Better Guide @ www.soprema.ca

Building Science Deconstructed, Beyond the Perfect Wall @ www.Dorken.com

Various Webinar presentations by John Straube & Joe Lstiburek

Technology requirements (D2L etc.): In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Broadband internet connection

Additional Classroom Conduct and Related Information

Guidelines for Zoom Sessions in Online Classes

Students are expected to participate actively in all Zoom sessions and to turn on their webcam. Please join our class in a quiet space that will allow you to be fully present and engaged in the Zoom sessions. Students must behave in a professional manner during the session. Students, employees, and academic staff are also expected to demonstrate behaviour in class that promotes and maintains a positive and productive learning environment.

Assessment and Evaluation Information

Proficiency in the course is demonstrated by the student's ability to analyze and detail building assemblies and discuss the merits and deficiencies of the various materials for particular applications. In addition, some proficiency in understanding the basic requirements of the Alberta Building Code 2017 will be required.

There will be no final exam. Students must obtain an overall passing grade to pass this course.

Final evaluation is based on the following:

Assignment 1, 10% – Schematic Design Building Code Review. Due date Feb.10.
Submission to be submitted digitally as a PDF.

Assignment 2, 20% – Preliminary Building/Wall Section Review. Due date March 10.
Submission to be submitted digitally as a PDF.

Studio Project, 70%. – Due date TBA. Submission to be submitted digitally as a PDF.

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

Grading Scale				
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	

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.

CACB Student Performance Criteria
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) B5: Accessibility, B6: Life Safety Systems; B9 Building Envelopes; B11 Building Materials; C1 Detailed Design Development; C2 Building Systems Integration; C3 Technical Documentation.

Topic Areas & Detailed Class Schedule

Include information relevant to the class schedule, such as weekly topics, readings, and assignment due dates. For online, remote or blended courses include whether course activities are synchronous (i.e., real-time/Zoom) and asynchronous (i.e., students complete on their own time such as discussion boards, watching videos, etc.). It is recommended that important dates including the first day of classes, holidays, term breaks and last day of classes also be included.

Course Schedule Date	Topic	Assignments/Due Dates
Week 1 Jan. 11 & 13	Introduction Part 1 Building Code Overview	
Week 2 Jan. 18 & 20	Part 2 Building Code Overview, NECB 2017 Geotechnical, Foundation Types	
Week 3 Jan. 25 & 27	Building Science Theory Recap "Beyond the Perfect Wall" Delta webinar with John Straube	
Week 4 Feb. 1 & 3	Masonry – brick, stone, gabion etc. Glazed Wall Systems – curtain wall, 'window' wall, structural glazing etc.	
Week 5 Feb. 8 & 10	Panelized Claddings – flat composite. Insulated metal, cement composite, precast etc. 'Flat Roofing' – exposed and inverted membranes, green roofs	Feb. 10 Assignment # 1 – Schematic Building Code
Week 6 Feb. 15 - 19	Reading Week	
Week 7 Feb. 22 & 24	Assignment # 1 Review Complex Form	
Week 8 Mar. 1 & 3	Zoom Crits	
Week 9 Mar. 8 & 10	Zoom Crits Glass Selection – spacers, shading coefficients vs. transparency etc.	Mar.10 Assignment #2 – Preliminary Wall/Building Sections
Week 10 Mar. 15 - 19	Block Week	
Week 11 Mar. 22 & 24	Assignment #2 Review Zoom Crits	

Week 12 Mar. 29 & 31	Zoom Crits Final Drawing Deliverables	
Week 13 Apr. 5 & 7	Easter Monday – no class Zoom Crits	
Week 14 Apr. 12 & 14	Zoom Crits	Final Project - TBD

Guidelines for Zoom Sessions

Zoom is a video conferencing program that will allow us to meet at specific times for a “live” video conference, so that we can have the opportunity to meet each other virtually and discuss relevant course topics as a learning community.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor’s permission.

The use of video conferencing programs relies on participants to act ethically, honestly and with integrity; and in accordance with the principles of fairness, good faith, and respect (as per the [Code of Conduct](#)). When entering Zoom or other video conferencing sessions (such as MS Teams), you play a role in helping create an effective, safe and respectful learning environment. Please be mindful of how your behaviour in these sessions may affect others. Participants are required to use names officially associated with their UCID (legal or preferred names listed in the Student Centre) when engaging in these activities.

Instructors/moderators can remove those whose names do not appear on class rosters. Non-compliance may be investigated under relevant University of Calgary conduct policies (e.g. [Student Non-Academic Misconduct Policy](#)). If participants have difficulties complying with this requirement, they should email the instructor of the class explaining why, so the instructor may consider whether to grant an exception, and on what terms. For more information on how to get the most out of your zoom sessions visit:

<https://elearn.ucalgary.ca/guidelines-for-zoom/>

If you are unable to attend a Zoom session, please contact your instructor in advance to arrange an alternative activity for the missed session (e.g., to review the recorded session). Please be prepared, as best as you are able, to join class in a quiet space that will allow you to be fully present and engaged in Zoom sessions. Students will be advised by their instructor when they are expected to turn on their webcam (for group work, presentations, etc.).

The instructor may record online Zoom class sessions for the purposes of supporting student learning in this class – such as making the recording available for review of the session or for students who miss a session. Students will be advised before the instructor initiates a

recording of a Zoom session. These recordings will be used to support student learning only and will not be shared or used for any other purpose.

University of Calgary Policies and Supports

COVID-19 PROCEDURE FOR SICK STUDENTS: <https://ucalgary.ca/risk/sites/default/files/Covid-19%20Folder/COVID-19-Procedure-for-Sick-Students.pdf>

ACADEMIC ACCOMMODATION

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The Student Accommodations policy is available at <https://ucalgary.ca/student-services/access/prospective-students/academic-accommodations>.

Students needing an accommodation based on disability or medical concerns should contact Student Accessibility Services (SAS) in accordance with the Procedure for Accommodations for Students with Disabilities (<https://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities.pdf>). 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.

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/.

ACADEMIC MISCONDUCT

Academic Misconduct refers to student behavior which compromises proper assessment of a student's academic activities and includes: cheating; fabrication; falsification; plagiarism; unauthorized assistance; failure to comply with an instructor's expectations regarding conduct required of students completing academic assessments in their courses; and failure to comply with exam regulations applied by the Registrar.

For information on the Student Academic Misconduct Policy and Procedure please visit:

<https://ucalgary.ca/policies/files/policies/student-academic-misconduct-policy.pdf>
<https://ucalgary.ca/policies/files/policies/student-academic-misconduct-procedure.pdf>

Additional information is available on the Academic Integrity Website

at <https://ucalgary.ca/student-services/student-success/learning/academic-integrity>.

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 (<https://www.ucalgary.ca/pubs/calendar/current/k.html>).

INSTRUCTOR INTELLECTUAL PROPERTY

Course materials created by instructors (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the instructor. These materials may NOT be reproduced, redistributed or copied without the explicit consent of the instructor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

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.

SEXUAL VIOLENCE POLICY

The University recognizes that all members of the University Community should be able to learn, work, teach and live in an environment where they are free from harassment, discrimination, and violence. The University of Calgary's sexual violence policy guides us in how we respond to incidents of sexual violence, including supports available to those who have experienced or witnessed sexual violence, or those who are alleged to have committed sexual violence. It provides clear response procedures and timelines, defines complex concepts, and addresses incidents that occur off-campus in certain circumstances. Please see the policy available at <https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>

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://www.ucalgary.ca/secretariat/student-appeals>

OTHER IMPORTANT INFORMATION

Please visit the Registrar's website at:

<https://www.ucalgary.ca/registrar/registration/course-outlines> for additional important information on the following:

- Wellness and Mental Health Resources
- Student Success
- Student Ombuds Office
- Student Union (SU) Information
- Graduate Students' Association (GSA) Information
- Emergency Evacuation/Assembly Points
- Safewalk