



Course Number	ARCH 672	Classroom	On Campus: TBD
Course Name	Exploring Deep Green Retrofits		
Pre/Co-Requisites	n/a		
Instructor	James Furlong	Office Hours/Location	By appointment
	Email: james.furlong@UCalgary.ca jfurlong@mcw.com (after hours)		Phone: (403) 803-9476
Class Dates	March 14, 15, 16, 17, 18		
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 24 hours. My business email is checked most frequently during afternoons and evenings, and students are encouraged to use it. Please have ARCH 672 in the subject line.		
Name and Email of Teaching Assistant(s)	n/a		

Course Description

<https://www.ucalgary.ca/pubs/calendar/current/architecture.html#45227>

Through group discussions, person inquiry, case studies, site visits, lectures, and a student-led building analysis and design proposal, the course will explore the challenges and opportunities of retrofitting buildings in order to improve occupant well-being, while achieving reductions in energy, water and carbon emissions. Practical and aspirational approaches for envelope modifications, programming changes, undertaking construction while occupancy continues, improving indoor environmental quality, and applying alternative and renewable energy systems will be explored. Common economic and technical barriers shall be discussed, and third-party green building rating systems applicable to deep retrofits such as LEED and Passive House shall be explored as they pertain to major renovations. In addition to the formal topics, there will be ample opportunity for student-led exploration and inquiry into related topics of personal interest. Participants will leave the course with a viable retrofit case study for their portfolios, along with an appreciation and insights into one of the most promising and high-growth sectors of the cleantech and architecture industries.

Course Hours: 1.5 units

Online Delivery (If applicable)

N/A

Course Learning Outcomes

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

- 1. To demonstrate an understanding of the theories, principles and practices focused on sustainable deep retrofits.
- 2. To analyze existing buildings for retrofit potential through a triple bottom line approach.
- 3. Gain an understanding straightforward, advanced and practical examples of how energy and carbon savings can be achieved in retrofit scenarios.
- 4. To understand the potential tradeoffs and limitations of retrofit interventions.
- 5. To formulate personal and professional positions concerning sustainability for existing buildings.

Learning Resources

Required readings, textbooks and learning materials:

A Roadmap for Retrofits in Canada:

https://www.cagbc.org/CAGBC/Advocacy/A_Roadmap_for_Retrofits_in_Canada.aspx

The First Ten LEED Zero Projects

<https://www.usgbc.org/articles/first-10-leed-zero-projects>

The Folly of Deep Energy Retrofits

<https://www.remodeling.hw.net/business/design/the-folly-of-deep-energy-retrofits>

Technology requirements (D2L etc.): N/A

Workshop Safety Training Requirement

If a course requires the use of the SAPL workshop, students must complete all online University of Calgary safety courses, the online Trajectory safety training course, as well as in-person workshop training and a grade of pass on the final evaluation project, to be granted access to the SAPL workshop. This training is offered once a year, around the start of the Fall term and has a completion deadline.

Additional Classroom Conduct and Related Information

Guidelines for Zoom Sessions in Online Classes

NA

Assessment Components

Assessment Method	Description	Weight	Aligned Course Learning Outcome
1) Student Participation	<i>Participation in this class, including class discussions, giving feedback on presentations of other students (peer review for projects), group work in class, will form 15% of the total student grade. This participation has proven to be very important in this class, as it contribute significantly to enrich the experience of all students</i>	15%	
2) Team Project	<i>Existing Building Analysis: Analyze a building's existing characteristics through a sustainability lens.</i>	25%	2-5
3) Team Presentation	<i>10 Minute Group Presentation of Your Analysis/Findings, followed by class</i>	10%	2-5

	<i>Questions and Answers. Students should be prepared to defend their analysis and assertions.</i>		
4) Team Project	<i>Developing a Comprehensive Retrofit Intervention Proposal for the analyzed building.</i>	35%	2-5
5) Team Presentation	<i>15 Minute Group presentation of the Intervention Proposal, followed by Questions and Answers. With links to their prior analysis, students should be prepared to defend their proposal and effectively communicate its benefits.</i>	15%	2-5

Assessment and Evaluation Information

Attendance and Participation Expectations:

Attendance at morning lectures and workshops is mandatory.

Guidelines for Submitting Assignments:

Use D2L and carefully review assignment overview instructions

Final Examinations: Not Applicable

Expectations for Writing (<https://www.ucalgary.ca/pubs/calendar/current/e-2.html>):

Late Assignments:

-2% for every 24hours of delay

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.

The School of Architecture, Planning and Landscape will not permit the Flexible Grade Option (CG Grade) for any course offered by the School. (<https://www.ucalgary.ca/pubs/calendar/current/salp-3-3.html>)

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): A1. Critical Thinking Skills; A2: Design Skills; A4: Program Analysis; A5: Site Context and Design; A6. Human Behaviour, and B4. Sustainable Design. (see CACB SPC matrix for further details)

Topic Areas & Detailed Class Schedule

Course Schedule Date	Topic	Assignments/Due Dates
Monday, March 14	Review of Sustainability Concepts and Frameworks; Self-guided Site Tour (afternoon). Complete assigned Reading for Tuesday.	
Tuesday, March 15	Sustainability Concepts Cont. Owner Presentation of Project & Goals. Example Case Studies Continued. Discuss assigned readings.	
Wednesday, March 16	Guest Speaker: Green Building Rating Systems & Retrofits; Submission of Analysis and Group Presentations and Discussions. Brainstorming	Course Project Part 1 submission (on D2L) by 8 am, Before Class
Thursday, March 17	Guest Speaker: Historic Building Renovations. Workshopping and Refining Proposed Interventions	
Friday, March 18	Submission of Intervention Proposal and Group Presentations	Course Project Part 2 submission (on D2L) by 8 am, Before Class

Guidelines for Zoom Sessions

N/A

Special Budgetary Requirements

N/A

University of Calgary Policies and Supports

COVID-19 PROCEDURE FOR SICK STUDENTS: <https://www.ucalgary.ca/risk/covid-19-procedure-for-sick-students>

UNIVERSITY OF CALGARY COVID-19 UPDATES: <https://www.ucalgary.ca/risk/emergency-management/covid-19-response>

ACADEMIC ACCOMMODATION

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The student accommodation policy can be found at: <https://www.ucalgary.ca/legal-services/university-policies-procedures/student-accommodation-policy>

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: <https://www.ucalgary.ca/legal-services/university-policies-procedures/accommodation-students-disabilities-procedure>

Students needing an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to their instructor (contact information on first page above).

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 a grade that they have received, they should refer to Section I of the Undergraduate Calendar (<https://www.ucalgary.ca/pubs/calendar/current/i-3.html>) which describes how to have a grade reappraised. In addition, the student should refer to the SAPL's Procedure for reappraisal of grades

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