



<b>Course Number</b>	<b>ARST 421</b>	<b>Classroom</b>	<b>Zoom</b>
<b>Course Name</b>	<b>Architecture and Life Cycle Thinking: climate change and beyond</b>		
<b>Pre/Co-Requisites</b>	<b>ARST 201</b>		
<b>Instructor</b>	<b>Dr. Getachew Assefa</b>	<b>Office Hours/Location</b>	<b>By appointment/Zoom</b>
	<b>Email: gassefa@ucalgary.ca</b>		<b>Phone: 403 616 1527</b>
<b>Class Dates</b>	Mandatory real-time Zoom classes: Tuesdays and Thursdays, January 11 – April 15, 11:00am to 12:50pm Other asynchronous assignments due during Jan 11 – April 15, 2021		
<b>Instructor Email Policy</b>	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.		
<b>Name and Email of Teaching Assistant(s)</b>	TBD		

## Course Description

(This course focuses on introduction to strategies for comparing building and product performance in relation to environmental impacts and contributions to climate change. Concepts of circular economy, life cycle analysis, embodied energy, recycling/reuse of building materials are explored through the lenses of resource depletion, carbon and water footprints, and waste generation.

In this course, students will learn about the factors that make some buildings and building products superior than alternatives in climate change and other environmental impact comparisons. Using the circular economy concept as a platform, the course explores life cycle perspective of building design in the selection of materials and energy; design considerations for disassembly, reuse and recycling of materials and products; and repurposing of building products and buildings for multiple uses in the same product or another life in new products. Embodied, operating and demolition stages of buildings will be examined using relevant environmental sustainability metrics.

**Course Hours:** 3 units; (2-1Tutorial)

Calendar description:

<https://www.ucalgary.ca/pubs/calendar/current/architectural-studies.html#43882>

## Online Delivery

Learning in this course will occur in both synchronous on Zoom as per the scheduled time included in this course outline during the dates and times already timetabled for this course. Asynchronous learning includes watching recorded lecture videos and other resources that will be posted on the D2L site of the course. Students are required to take part in both synchronous and asynchronous learning. If unable to participate live due to unforeseen circumstances, inform the instructor in advance to work out an alternative participation activity.

## Course Learning Outcomes

After completion of the course the students should be able to:

1. **Describe** and **explain** the concepts of life cycle thinking and life cycle assessment
  2. **Describe** and **explain** the building life cycle performance in architectural context
  3. **Analyze** the material and energy aspects of buildings from a life cycle perspective including climate change and other environmental impacts
- Explain** and **analyze** the challenges and opportunities of using life cycle assessment through product category rules and environmental product declarations and for use in rating and certification of building materials and buildings

## Learning Resources

### **Recommended (NOT required) course book:**

Crawford, R (2011) *Life Cycle Assessment in the Built Environment*. London ; New York: Spon[Full Text Available Online through the UofC Library]

### **Further learning materials:**

[www.buildingscience.com](http://www.buildingscience.com)

### **Technology requirements:**

- D2L and Menti will be used as course platforms
- Most current laptops will have a built-in or external webcam, built-in or external speaker and microphone.
- 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 Components			
Assessment Method	Description	Weight	Aligned Course Learning Outcome
Quizzes: multiple choice	Five: four best will be taken for the final grades	20	All
Review	Individual written submission	10	All
Summary of discussions	Individual written submission	10	All
Project component 1 – building materials	Group written submission	30	3
Project component 2– energy in buildings	Group written submission	5	3
Project component 3– synthesis of component 1 and 2	Group presentation	15	3
Test covering whole course (Fill in the Blanks(Short Answers)	Individual	10	All

## Assessment and Evaluation Information

### **Attendance and Participation Expectations:**

All students are expected to attend and participate in the In-Class Discussion Labs as groups and perform the review. All group members are expected to participate in the group work and each member's specific contribution should be clearly documented.

### **Guidelines for Submitting Assignments:**

Assignments should be submitted through D2L Dropbox before midnight of the deadline date.

### **Final Examinations:**

There will be quizzes and a test but no final examination.

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

written submissions should have a clear structure using headings, citation of sources when appropriate, written in single spaced 12pts times new roman or equivalents (for Word document submissions) and clearly show the names of group members.

**Late Assignments:** 1 mark per day late will be deducted for each late submission of assignment.

**Criteria that must be met to pass:** there is no specific component that will be used as a criteria. It is the overall performance that will determine the final score.

Final grades will be reported as letter grades, with correspondence between letter grades, 4-points scale and percent based on the following grading scale.

<b>Grading Scale</b>			
<b>Grade</b>	<b>Grade Point Value</b>	<b>Percent</b>	<b>Description</b>
A+	4.00	92.5-100	Outstanding
A	4.00	85-92.49	Excellent - superior performance showing comprehensive understanding of the subject matter
A-	3.70	80-84.99	Very good performance
B+	3.30	76-79.99	
B	3.00	73-75.99	Good – clearly above average performance with knowledge of subject matter generally complete
B-	2.70	70-72.99	
C+	2.30	66-69.99	
C	2.00	63-65.99	Satisfactory – basic understanding of the subject matter
C-	1.70	60-62.99	Receipt of a grade point average of 1.70 may not be sufficient for promotion or graduation (see individual undergraduate faculty regulations)
D+	1.30	56-59.99	
D	1.00	50-55.99	Minimal pass – marginal performance
F	0.00	0-49.99	Fail – unsatisfactory performance or failure to meet course requirements

## Topic Areas & Detailed Class Schedule

*Lectures with the exception of guest lectures will be recorded and be available for asynchronous (AS) review ahead of the synchronous sessions (S)*

Course Schedule Date	Topic	Assignments/Due Dates
January 12	<b>L1: Course introduction</b>	
January 14	Tutorial	
January 19	<b>L2: Climate change</b>	
January 21	Tutorial	
January 26	<b>L3: Resource depletion and waste generation</b>	Quiz 1: L1 and L2
January 28	Tutorial	
February 2	<b>L4: Water footprint and other environmental impacts</b>	
February 4	Tutorial	
February 9	<b>L5: Life cycle perspective of building design</b>	Quiz 2: L3 and L4
February 11	<b>L6: Materials in buildings</b>	Quiz 3: L5
February 16	No classes – term break	
February 18	No classes – term break	
February 23	<b>L7: Energy in buildings</b>	Quiz 4: L6
February 25	Tutorial	Review submission
March 2	<b>L8: Product category rules, environmental product declarations and building performances benchmarking</b>	
March 4	Tutorial	Summary of discussions submission
March 9	<b>GL1: Life cycle thinking in LEED and other rating systems</b>	Mauritz Glaumann - TBC
March 11	Tutorial	Project component 1 submission
March 16	<b>GL2: Architectural design workflow</b>	Jim Love - TBC
March 18	Tutorial	Project component 2 submission
March 23	<b>L9: Circular economy concepts and tools</b>	Quiz 5: L7 and L8
March 25	Tutorial	
March 30	<b>GL3: MacKimmie Tower</b>	Dialog - TBC

April 1	Tutorial	
April 5		<a href="#">Project component 3 submission</a>
April 6	<b>GL4: Passive Houses and Sustainable Buildings</b>	<b>Frank Crawford -TBC</b>
April 8	Presentation	
April 13	Presentation	
April 15	Presentation Test	

## 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/](http://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](http://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