



Course Number	ARCH 680.9 L02	Classroom	PF 3176
Course Name	Special Topics in Architecture/Environmental Engineering – Industrial Ecology		
Pre/Co-Requisites			
Instructor	Dr. Getachew Assefa	Office Hours/Location	By appointment/Zoom
	Email: gassefa@ucalgary.ca	Phone: 403 616 1527	
Class Dates	Mandatory classes: Tuesdays and Thursdays January 10 – April 11, 2023 9:00am to 10:30pm		
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)	TBD		

Course Description

This course in *Introduction to Industrial Ecology* is an elective course for design and engineering students from the School of Architecture, Planning and Landscape and others schools and faculties at the University of Calgary. The philosophy behind the concept of Industrial Ecology is the focus on the understanding of interactions between technical, economic, social and ecological systems and processes. Industrial ecology can also be considered as a concept of dealing with how the industry in its broader term including urban systems, or rather the entire industrial society of today, would work in the future in order to reduce its impact associated with the interference with life-supporting ecosystems.

This course offered for undergraduate and graduate students equips would-be architects, engineers, planners, business professionals and designers with systems perspective of understanding the implications of the decisions they make at different levels in practicing their profession and acting as consumers.

The course is structured to be delivered through

- Lectures and guest lectures
- Summary and reflection
- Individual assignments

- Group project
- Reflection and In-Class (Breakout) discussions sessions

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

Online Delivery

Learning in this course will occur as per the scheduled dates and times included in this course outline.

Asynchronous learning includes reviewing lecture files and other resources that will be posted on the D2L site of the course. Students are required to take part in both lecture and In-Class Discussions. If unable to attend 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** similarities and differences between a natural ecosystem and an industrial system
2. **Describe** and **explain** concept of industrial ecology (IE) in practice and research
3. **Analyze** industrial and urban cases from sustainability performance perspective and **apply** IE concepts in systems such as energy systems and natural resource management
4. **Explain** and **analyze** challenges and opportunities of **IE** in creating and operating sustainable urbanism/industry
5. **Explain** interactions between sustainable consumption and production within the framework of **IE**
6. **Evaluate** relevance of **IE** to practical project examples such a material recycling and energy recovery facility

Learning Resources

Required readings, textbooks and learning materials:

- peer-reviewed journal articles relevant for each component will be provided (refer to a separate **reading list**)

(NOT required) course textbook:

- Bourg, Erkman, Bourg, Dominique, and Erkman, Suren. Perspectives on Industrial Ecology. Sheffield, South Yorkshire, England: Greenleaf Pub., 2003. Web. Full Text Available Online Through the UofC Library
- Additional materials:
 - Ayres, R. U., & Ayres, L. (Eds.). (2002). A handbook of industrial ecology. Edward Elgar Publishing

- o Graedel, T. E., & Allenby, B. R. (2010). *Industrial Ecology and Sustainable Engineering: International Edition* (p. 425). Pearson Education Inc., Upper Saddle River, Prentice Hall.

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 choices	Five: for each students the best four will be taken for the final grades	20 (5X4)	All
Perspective assignment	Individual	10	All
Review assignment: summary text and reflection video	Individual: two reviews	20 (2X10)	All
Project	Group	30 (oral presentation 20, submitted files 10)	All
Summary and reflection of In-Class Discussion Lab	Group	10	All
Test covering the 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 Lab, in project activities as groups. 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:

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

Final Examinations:

There is no scheduled final exam for the course. Instead, there will be quizzes and a test.

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 equivalent (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.

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.

Topic Areas & Detailed Class Schedule		
Course Schedule Date	Topic	Assignments/Due Dates
January 10 (Tuesday)	L1: Course introduction	
January 12 (Thursday)	In-Class Discussion Lab 1 - Desirable Future	
January 17 (Tuesday)	L2: Anthroposystem: lessons from natural ecosystems	
January 19 (Thursday)	In-Class Discussion Lab 2 - Feature(s) of natural ecosystems	
January 24 (Tuesday)	L3: IE concepts and tools	
January 26 (Thursday)	In-Class Discussion Lab 3 - planetary boundaries	Quiz 1 on L2
January 31 (Tuesday)	L4: Materials and IE: sustainable consumption and production	
February 2 (Thursday)	In-Class Discussion Lab 4 - sustainable consumption	Quiz 2 on L3
February 7 (Tuesday)	L5: Energy and IE	Submission of Individual Perspective
February 9 (Thursday)	In-Class Discussion Lab 5 - electrification	Quiz 3 on L4
February 14 (Tuesday)	L6: Life cycle sustainability assessment as an organizing concept for IE	
February 16 (Thursday)	In-Class Discussion Lab 6	Quiz 4 on L5
February 21	No classes – term break	

February 23	No classes – term break	
February 28 (Tuesday)	GL1: Swedish experience of IE	Björn Frostell - TBC
March 2 (Thursday)	In-Class Discussion Lab 6- Swedish experience	Submission of summary and reflection 1
March 7 (Tuesday)	L7: Sustainability indicators: IE and data	
March 9 (Thursday)	In-Class Discussion Lab 7- Data and visualization	
March 14	No classes - SAPL Block week	
March 16	No classes - SAPL Block week	
March 21 (Tuesday)	L8: IE applications and research	Quiz 5 on L7
March 23 (Thursday)	GL2: The Manchester Project	Noel Keough - TBC
March 24 (Friday)		Submission of summary and reflection 2
March 28 (Tuesday)	GL3:	- TBC
March 30 (Thursday)	In-Class Discussion Lab 8 : Planning versus Self-organizing: debate	Submission of Summary of In-Class Discussion Labs
April 4 (Tuesday)	Test Project time	
April 6 (Thursday)	Site visit to Calgary's material recovery facility	Afternoon (TBC)
April 10 (Monday) - 10am		Submission of Project PowerPoint file and supplementary materials
April 11 (Tuesday)	Presentation	

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 unauthorized 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