



<b>Course Title: Introduction to Industrial Ecology</b>			
Course Number	<b>EVDS 683.48/ENEN 619.12 H(2-1)</b>		
Pre/Co-Requisites			
Instructor Name	Getachew Assefa	Instructor Email	gassefa@ucalgary.ca
Office Location	PF3191		
TA Name		TA Email	
Class Dates	Winter 2020, Tuesdays and Thursdays		
Class Times	10:40am to 12:10pm		
Class Location	PF 3176		

## Course Information / Description of the Course

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 the 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.

## Learning Resources

Required readings, textbooks and learning materials:

**Required readings:**

- peer-review journal articles relevant for each component will be provided as part of the Briefing exercise (refer to separate **reading list**)

**(NOT required) course books:**

- Graedel, T.E., and Allenby, B.R. (2003) *Industrial Ecology*, Prentice Hall.
- Erkman, S. and Ramaswamy, R. (2003) *Applied Industrial Ecology - A New Platform for Planning Sustainable Societies*

**For take-home exam:**

- Ayres and Ayres (2002) *A Handbook of Industrial Ecology*, Edward Elgar Pub. Cheltenham, UK. [Full Text Available Online Through the UofC Library]

## Course Learning Outcomes

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

1. **Describe** and **explain** the similarities and differences between an ecosystem and an industrial system
2. **Describe** and **explain** the 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** the challenges and opportunities of **IE** from sustainable urbanism/industry
5. **Explain** the interaction between sustainable consumption and production within the framework of **IE**
6. **Evaluate** the relevance of **IE** to practical project examples such a material recycling and energy recovery facility

Assessment Components				Changes
Assessment Method	Description	Weight	Aligned Course Learning Outcome	
Perspective assignment	Individual	10	All	No change, already submitted
Brief summary and video (3x10)	Individual	30	All	No change, two already submitted

Project	Individually	15	All	Reduced weight; changed from group to individual
Summary of In-Class Discussion Lab	Individual	15	All	Reduced weight and from group to individual
Take-home exam	Individual	30	All	Increased weight

## 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 will be a take-home exam at the end of the course.

### **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.

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

## 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/Location
Week 1	Jan 14	<b>Course introduction</b>	

	Jan 16	In-Class Discussion Lab	
Week 2	Jan 21	<b>Metaphor of industrial ecosystems</b>	
	Jan 23	In-Class Discussion Lab	
Week 3	Jan 28	<b>Materials and IE: sustainable consumption and production, industrial symbiosis</b>	
	Jan 30	In-Class Discussion Lab	
Week 4	Feb 4	<b>Energy and IE</b>	
	Feb 6	In-Class Discussion Lab	
Week 5	Feb 11	<b>IE concepts and tools</b>	
	Feb 13	In-Class Discussion Lab	
	Feb 15		Submission of Individual Perspective Assignment – new date
	Feb 18	No class – UofC mid-term break	
	Feb 20	No class – UofC mid-term break	
Week 7	Feb 25	<b>Sustainability indicators: IE and data</b>	
	Feb 27	In-Class Discussion Lab	
Week 8	Mar 3	<b>IE and sustainable urbanism</b>	Submission of Summary and Reflection 1 – new date
	Mar 5	In-Class Discussion Lab	

			Submission of Summary and Reflection 2
	Mar 10	No class – SAPL block week	
	Mar 12	No class – SAPL block week	
Week 10	Mar 17		
	Mar 19	In-Class Discussion Lab	ZOOM
Week 11	Mar 24	<b>Life cycle sustainability assessment as an organizing concept for IE</b>	ZOOM
			Submission of Summary and Reflection 3
	Mar 26	<b>IE applications and research</b>	ZOOM
Week 12	Mar 31	Project time	Project time
	Apr 2	<b>The Manchester Project</b>	Noel Keough - ZOOM
Week 13	Apr 7	<b>DIRTT Guest presentation</b>	David Glenwright and Katelyn Adley – ZOOM (to be confirmed)
	Apr 9	Project time	Submission of Summary of In-Class Discussion Labs - ZOOM
	Apr 12		Submission of Project PowerPoint file and supplementary materials

Week 14	Apr 14	<b>Natural resource extraction and utilization</b>	Project Presentation - ZOOM
	April 16		Submission of group Project grades with motivation
	April 18	<b>Take-home exam</b>	Questions posted
	April 25		Submission of answers

## Media and Recording in Learning Environments

### Part 1

University Calendar: <https://www.ucalgary.ca/pubs/calendar/current/e-6.html>

Recording of lectures (other than audio recordings that are pre-arranged as part of an authorized accommodation) is not permitted.

Students may not record any portion of a lecture, class discussion or course-related learning activity without the prior and explicit written permission of the course instructor or authorization from Student Accessibility Services. For any other use, whether by duplication, transcription, publication, sale or transfer of recordings, written approval must be obtained from the instructor for the specific use proposed. Any use other than that described above constitutes academic misconduct and may result in suspension or expulsion.

### Part 2

The instructor may use media recordings to capture the delivery of a lecture.

The instructor will notify all students and guests in the class that the event is being recorded. If a student or guest wants to take steps to protect privacy, and does not want to be recorded, the instructor will provide the individual (s) with an alternative means of participating and asking questions (e.g., passing written notes with questions). Students cannot be penalized for choosing not to be recorded in situations where participation is part of the course. Students must be offered other ways of earning participation credit that do not involve recording.

Any video-recording would be intended to only capture the instructor and the front of the classroom. Students/other participants would not necessarily be visible on video recordings.

## University of Calgary Policies and Supports

## **ACADEMIC ACCOMMODATION**

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; 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/). 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. The full policy on Student Accommodations is available at <http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf>.

## **ACADEMIC MISCONDUCT**

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, (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. Any suspicion of plagiarism will be reported to the Dean, and dealt with as per the regulations in the University of Calgary Graduate Calendar. For information on academic misconduct and its consequences, please see the University of Calgary Calendar at <http://www.ucalgary.ca/pubs/calendar/current/k.html>

## **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.

## **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.

**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://ucalgary.ca/student-appeals/>

**More student support and resources (e.g. safety and wellness) can be found here:** <https://www.ucalgary.ca/registrar/registration/course-outlines>