

ENBUS 204: Principles of Industrial Ecology

FALL 2021

Instructor: Dr. Komal Habib (komal.habib@uwaterloo.ca)

Dr. Habib's Office: EV3 4247

Office Hours: Wednesdays 11:30am-1:30pm by appointment only, also available to schedule virtual appointments at another mutually agreed upon time.

Delivery of Course Material: Material for this course will be delivered by the LEARN system.

Go to <https://learn.uwaterloo.ca/>

COURSE DESCRIPTION

Industrial ecology is the systematic analysis of global, regional and local material and energy flows that are associated with products, processes, industrial sectors, and economies. Included in these analyses are energy consumption, non-renewable and renewable materials consumption, air pollutant emissions, waterborne pollutant effluents and solid waste generation associated with human activities. These analyses are the foundation of industrial ecology, which seeks to design and manage products and services that meet human needs in a more sustainable manner. This course will familiarize you with the vocabulary and analysis techniques used to assess and improve product systems.

LEARNING OUTCOMES

By the end of this course, you should:

- Be able to assess/evaluate environmental impacts of a product system
 - Understand and quantify material and energy flows
 - Calculate performance metrics
 - Critique/evaluate claims
 - Locate and select appropriate data to construct flow diagram for a simple product system
 - Interpret flow diagrams
- Acquire skills necessary for professional competence
 - Demonstrate facility with disciplinary vocabulary
 - Demonstrate facility with data and their manipulation

READINGS

As there is no textbook for this course, all readings will be assigned during the term through LEARN. These readings come from a combination of peer-reviewed academic literature and 'grey' (not peer-reviewed) literature and web sites. Complete citations or web links will be provided for all readings. It will be demonstrated how to search on electronic journal databases to obtain readings in lecture.

COURSE ASSESSMENT:

Activities and assignments	% of final grade
Quizzes: 6 quizzes, lowest graded quiz will not be counted in the LEARN gradebook.	50% (10% each)
Weekly discussion forums: for 3 weeks, with a different topic for each weekly forum.	30%
Assignments: 2 assignments. Submit to LEARN dropbox. Assignments may employ the LEARN dropbox using Turnitin.	20%

Class Schedule:

Week	Date	Topic	Tutorial* (Wednesday 10:30am – 11:30am)	Quiz (Friday)	Activities and Assignments
1	Sep 8-12	Course introduction	---		Weekly discussion: Introduce yourself
2	Sep 13-19	Fundamental concepts – units, conversions	Tutorial 1: Sep 15 (Microsoft Teams)	Quiz 1: 17 Sep	
3	Sep 20-26	Material Flow Analysis – I	Tutorial 2: Sep 22 (AL 208)		Weekly discussion I Initial post – due Sep 22 @ 11:59pm ET Response post – due Sep 24 @ 11:59pm ET
4	Sep 27 – Oct 3	Material Flow Analysis – II	Tutorial 3: Sep 29 (Microsoft Teams)	Quiz 2: 01 Oct	
5	Oct 4-8	Energy Flow Analysis	Tutorial 4: Oct 06 (AL 208)	Quiz 3: 08 Oct	
-	Oct 9-17	Reading week			
6	Oct 18-24	Life Cycle Assessment - I	Tutorial 5: Oct 20 (Microsoft Teams)		Assignment I (10%) – due Oct 24 @ 11:59pm ET
7	Oct 25-31	Life Cycle Assessment - II	Tutorial 6: Oct 27 (AL 208)	Quiz 4: 29 Oct	
8	Nov 1-7	Waste Management - I	Tutorial 7: Nov 03 (Microsoft Teams)		Weekly discussion II Initial post – due Nov 03 @ 11:59pm ET Response post – due Nov 05 @ 11:59pm ET
9	Nov 8-14	Waste Management - II	Tutorial 8: Nov 10 (AL 208)	Quiz 5: 12 Nov	
10	Nov 15-21	Documentary (Planned Obsolescence)	Tutorial 9: Nov 17 (Microsoft Teams)		Weekly discussion III Initial post – due Nov 17 @ 11:59pm ET Response post – due Nov 19 @ 11:59pm ET
11	Nov 22-28	Circular economy	Tutorial 10: Nov 24 (AL 208)		Assignment II (10%) – due Nov 28 @ 11:59pm ET
12	Nov 29 – Dec 3	Biomimicry	Tutorial 11: Dec 01 (Microsoft Teams)	Quiz 6: 03 Dec	

*Tutorials are meant to help students enhance their understanding of the course, where the instructor or TAs will answer students' questions and assist them in solving issues related to course content. The students unable to attend the in-person tutorials can use the [Tutorials\(Online\)](#) forum to get course related support.

Teaching Assistants (TAs):

1. Angie Cerilli-Stankevicius (acerillistankevicius@uwaterloo.ca)
2. Sohani Withanage (sohani.withanage@uwaterloo.ca)

ANNOUNCEMENTS

Your instructor uses the Announcements widget on the Course Home page during the term to communicate new or changing information regarding due dates, course content, etc., as needed. You are expected to read the announcements on a regular basis.

To ensure you are viewing the complete list of announcements, you may need to click Show All Announcements.

DISCUSSIONS

We have created an **Ask the Instructor** discussion forum. Use the Ask the Instructor Forum when you have a question that may benefit the whole class. Also, check this forum to see if your question has already been answered before reaching out to your instructor.

IMPORTANT CONTACT INFORMATION

Who and Why	Contact Details
<p>Instructor and TAs</p> <ul style="list-style-type: none">• Course-related questions (e.g., course content, deadlines, assignments, etc.)• Questions of a personal nature	<p>Post your course-related questions to the Ask the Instructor discussion topic. This allows other students to benefit from your question as well.</p> <p>Questions of a personal nature can be directed to your instructor.</p> <p>Instructor: Komal Habib komal.habib@uwaterloo.ca</p> <p>TA:</p> <ol style="list-style-type: none">1. Angie Cerilli-Stankevicius (acerillistankevicius@uwaterloo.ca)2. Sohani Withanage (sohani.withanage@uwaterloo.ca) <p>Your instructor and TAs will check email and the Ask the Instructor discussion topic frequently and will make every effort to reply to your questions within 48 hours, Monday to Friday during regular business hours. When emailing the instructor or TA, please indicate the course code (ENBUS 204) in the subject line. Please note questions sent less than two days before an assignment due date may not be answered.</p>

Who and Why	Contact Details
<p>Technical Support</p> <ul style="list-style-type: none"> • Technical problems with Waterloo LEARN 	<p>learnhelp@uwaterloo.ca</p> <p>Include your full name, WatIAM user ID, student number, and course name and number. Technical support is available during regular business hours, Monday to Friday, 8:30 AM to 4:30 PM (Eastern Time).</p> <p>LEARN Help Student Documentation</p>
<p>Student Resources</p>	<p>Student Resources</p> <ul style="list-style-type: none"> • Academic advice • Student success • WatCards • Library services and more

COVID-19 Guidelines for Instructional Space

SHORT-TERM PLAN: In the event of a short-term (e.g., one-week) cancellation of in-person classes, whether for ENBUS 204 or University-wide, ENBUS 204 tutorials will be offered online, synchronously on the scheduled day and time (e.g., Wednesdays 10:30am-11:30am). We will use MS Teams/Zoom and a meeting link will be posted in the announcements on the course Learn site and shared via email.

LONGER-TERM CANCELLATION PLAN: In the event of a longer-term (e.g., more than one-week) cancellation of in-person classes, whether for ENBUS 204 or University-wide, ENBUS 204 will be offered online, synchronously on the scheduled day and time (e.g., Wednesdays 10:30am-11:30am). We will use MS Teams/Zoom and a meeting link will be posted in the announcements on the course Learn site and shared via email.

ACCOMMODATIONS FOR STUDENTS WHO CANNOT ATTEND TUTORIALS DUE TO SELF-ISOLATION: If you are ill and/or required to self-isolate, you can review the asynchronous version of the tutorial material and you can meet virtually with the course instructor to ask questions or discuss content at a mutually agreed upon day and time or use the Ask the Instruction Discussion Forum.

Expectations for Students

- **Attendance:** Students are to attend only the section for which they are registered.
- **Absence:** Students shall not attend class if they are experiencing influenza-like illness, have been in close contact with someone who is ill, or have travelled outside of Canada within the past 14 days.
- **Face coverings:** Wearing of face-covering/mask is a requirement in all common areas on campus, including all indoor instructional spaces.
 - As such, no food is allowed to be consumed in instructional space. Beverages are allowed if a straw is used or if the mask is lowered only for a brief period.
 - When a student asks or answers a question it may be difficult for them to be heard while wearing a mask. A student may briefly lower their mask to ask/answer the question and then the mask must be replaced.
- **Hand hygiene:** Students are expected to practice frequent hand hygiene (handwashing with soap and water or use of hand sanitizer), including immediately before coming into an instructional space
- **Seating:** Students are permitted to sit where they wish. For fall term, many classes have enrolments only up to 50% of seating capacity. Students are encouraged to sit with one seat left empty between them and other students when possible.

Course Policies

POLICY ON LATE SUBMISSIONS

Submissions received up to 24 hours after the due date and time indicated above will have a 10 per cent penalty applied to them (of the 100 available per cent for that assignment). Submissions received 24-48 hours AFTER the due date and time indicated above will have a 20 per cent penalty applied to them (of the 100 available per cent for that assignment). Students not handing in their submissions within TWO DAYS of the due date and time will receive a mark of zero on that assignment. Exceptions will be made in extraordinary circumstances (usually related to medical emergencies supported by documentation). Students anticipating that their assignment will be submitted late are encouraged to contact the course instructor at the earliest possible time.

PROTOCOL FOR CONTESTING GRADED ASSIGNMENTS

Upon receipt of your graded assignment should you wish to contest the grading of your assignment (outside of simple errors in the addition of marks) the following protocol must be followed:

1. Read comments provided thoroughly.
2. After 24hours, submit an email to the course instructor detailing why your assignment warrants a review. Please be sure to provide specific examples and justification as to why you feel your grade should be reconsidered.
3. The instructor will then review the stated reasons and decide whether re-grading of the assignment is warranted.

4. Should the instructor deem that re-grading is warranted, the instructor will then ask the student whether they would like their assignment re-graded, recognizing that the student's grade could go up or down depending on the instructors' assessment.
5. The student can choose to either have the instructor go ahead with re-grading the entire assignment or stick with their original grade.

COURSE MATERIAL IS INTELLECTUAL PROPERTY FOR YOUR USE ONLY

All materials included in the course (e.g., PowerPoint slides) are made available digitally for your convenience, and are accessible through the LEARN course page. **THIS IS NOT A RIGHT BUT A PRIVILEGE.** Please note that the use of these materials is intended for students currently enrolled in ENBUS 204 only. The distribution of PDF files, PowerPoint slides or any other media, either to individuals or to third-party websites (e.g., CourseHero) is strictly prohibited. If there is any evidence that students have distributed materials from this course, the instructor will remove posted material, and cease posting intellectual property (e.g., PowerPoint slides) online and may pursue disciplinary action against the student(s) in question.

ELECTRONIC COMMUNICATIONS

- Electronic communication with TAs and Course Instructors must be sent through LEARN.
- The instructor will try to reply to inquiries from students within two business days. Please ensure that you include the course name and code in the email subject (e.g. ENBUS 204) and be sure to include your name.
- Make sure you consult the course syllabus, LEARN and other course materials before submitting inquiries through LEARN. The instructor will not respond to any requests or messages sent via personal email accounts or social media. Queries made near the due dates of assignments or tests may not be answered.
- Inquiries that require more than a 'yes' or 'no' answer might require an appointment during office hours.

University Academic Policies

INTELLECTUAL PROPERTY: Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo. Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository).

Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent). **ACADEMIC INTEGRITY:** In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. The University's guiding principles on academic integrity can be found here: <http://uwaterloo.ca/academicintegrity/>

ENV students are strongly encouraged to review the material provided by the university's Academic Integrity office specifically for students: <http://uwaterloo.ca/academicintegrity/Students/index.html>

Students are also expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for their actions. Student who are unsure whether an action constitutes an offense, or who need help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for team work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. Students may also visit this webpage: <https://uwaterloo.ca/library/get-assignment-and-research-help/academic-integrity/academicintegrity-tutorial>

When misconduct has been found to have occurred, disciplinary penalties will be imposed under **Policy 71 – Student Discipline**. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline,

<https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-71>

Students who believe that they have been wrongfully or unjustly penalized have the right to grieve; refer to **Policy #70, Student Petitions and Grievances**

GRIEVANCE: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. See **Policy 70 - Student Petitions and Grievances, Section 4**
www.adm.uwaterloo.ca/infosec/Policies/policy70.htm

When in doubt please contact your Undergraduate Advisor for details.

APPEALS: A decision made or penalty imposed under **Policy 70** - Student Petitions and Grievances (other than a petition) or **Policy 71** – (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to **Policy 72** (Student Appeals) www.adm.uwaterloo.ca/infosec/Policies/policy72.htm

Turnitin.com: Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students’ submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin® in this course.

It is the responsibility of the student to notify the instructor if they, in the first week of term or at the time assignment details are provided, wish to submit the alternate assignment.

NOTE FOR STUDENTS WITH DISABILITIES: [AccessAbility Services](#), located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

MENTAL HEALTH: The University of Waterloo, the Faculty of Environment and our Departments consider students' well-being to be extremely important. We recognize that throughout the term students may face health challenges - physical and / or emotional. **Please note that help is available.** Mental health is a serious issue for everyone and can affect your ability to do your best work. Counselling Services <http://www.uwaterloo.ca/counselling-services> is an inclusive, non-judgmental, and confidential space for anyone to seek support. They offer confidential counselling for a variety of areas including anxiety, stress management, depression, grief, substance use, sexuality, relationship issues, and much more.

RELIGIOUS OBSERVANCES: Please inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

UNCLAIMED ASSIGNMENTS: Unclaimed assignments will be retained until one month after term grades become official in quest. After that time, they will be destroyed in compliance with UW's [confidential shredding procedures](#).

RECORDING LECTURES: Use of recording devices during lectures or meetings is only allowed with explicit permission of the instructor of the course. If allowed, video recordings may only include images of the instructor and not fellow classmates. Posting of videos or links to the video to any website, including but not limited to social media sites such as: facebook, twitter, etc., is strictly prohibited.

CORONAVIRUS INFORMATION: [Coronavirus Information for Students](#) This resource provides updated information on COVID-19 and guidance for accommodations due to COVID-19.

TERRITORIAL ACKNOWLEDGEMENT

We acknowledge that we live and work on the traditional territory of the Attawandaron (Neutral), Anishinaabeg, and Haudenosaunee peoples. The University of Waterloo is situated on the Haldimand Tract, the land promised to the Six Nations that includes ten kilometres on each side of the Grand River.