

ACKNOWLEDGEMENT

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəyəm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on in their culture, history, and traditions from one generation to the next on this site.

COURSE INFORMATION

Course Title	Course Code Number	Credit Value
Industrial Ecology	BEST 402	3 credits

*This course has both lecture and tutorial components

Lecture time and venue

Tuesday, Thursday: 9:30 to 11:00 AM
MacLeod (MCLD) 2014

Tutorial time and venue

Wednesday: 1:00 to 3:00 PM
Orchard Commons 4004

Prerequisites

[Is there a course that students must have passed before taking this course?]

BEST 200 Foundations in Bioproducts and the Bioeconomy

[Is there a course that students must take concurrently (if not before)?]

None

CONTACTS

Course Instructor(s)	<p>Dr. Qingshi Tu Email: Qingshi.tu@ubc.ca Office: 4040 Forest Science Center Office Hours: 4-5 pm PST (via Zoom), Friday (15-min block by appointment via Canvas calendar)</p>
Course TA(s)	<p>Bidhan Bhuson Roy, PhD student at Department of Wood Science Email: bbroy@student.ubc.ca Office: 4041 Forest Science Center Office Hours: 4-5 pm PST (via Zoom), Wednesday (15-min block by appointment via Canvas calendar)</p> <p>Shiva Zargar, PhD student at Department of Wood Science Email: shiva.zargar@ubc.ca Office: 4041 Forest Science Center Office Hours: 4-5 pm PST (via Zoom), Monday (15-min block by appointment via Canvas calendar)</p>

COMMUNICATIONS

The instructors and TA will take an extra effort to ensure that students have sufficient opportunities to communicate their questions and concerns throughout the course. In order to maintain an efficient way of communication, we ask the students to kindly follow the procedure below when seeking answers to their questions.

When you look for information related to the course, before contacting the Instructor or TA, please make sure to: 1) check the syllabus; 2) check the website (announcements are regularly posted, and all deadlines are included there).

If you still need to contact the Instructor or TA, please follow this hierarchical procedure: 1) ask questions directly during lectures; 2) post the question in Discussion board on Canvas; 3) book a one-on-one appointment with the one of the TAs or the instructor via Canvas Calendar; 4) email the instructor if the issue still remains unsolved.

Also, please make sure you know **who to contact regarding specific matters**:

- Contact the **TA** regarding: lecture attendance issues, assignment grade inquiries, penalties, medical notes and concessions, etc.; the TA has full authority regarding all the aspects of the assignments.
- Contact the **instructor** regarding: lecture material and theory, tutorials, midterm and final project.

COURSE DESCRIPTION

The students will learn the knowledge and skills of industrial ecology for solving the complex problems related to sustainable development. The course will integrate elements of science, technology, and policy into the learning activities covering key topic areas such as climate change, resource efficiency and sustainable bioeconomy. Guest lecturers from academic, industrial and governmental sectors will bring a diverse perspective of current progress and challenges in these topic areas. The students will gain hands-on experiences with major industrial ecology methods during tutorial sessions. The tutorial sessions will also include participatory exercises related to emerging topics with grand challenges to society, where the students will apply the knowledge and skills to design solutions to those grand challenges.

COURSE STRUCTURE

There are **two lectures and one tutorial session each week, all delivered in-person**. The Instructor and TA will strive to offer a high level of presence both during and outside these sessions.

Lecture slides and other learning materials cover the key concepts and theory of industrial ecology. Learning activities, such as tutorials, in-class discussions and investigative case studies, encourage the active participation of students during the synchronous sessions. Pre-/post-lecture quizzes, surveys and assignments will enable students to gauge their learning progress. The content of assignment and exams will be closely aligned with the learning objectives, materials and activities covered during the lectures.

All learning materials will be made available through UBC Canvas learning management system. The course will be delivered in modules and students will be able to track their progress in Canvas as coursework is being completed, mark them as done for a visual illustration of progress, and make sure they meet deadlines. Canvas will allow students to navigate through the course progressively and smoothly. Deadlines for the completion of assignments will be established, but there will be flexibility for students to work on the materials on their own time.

There will be **one midterm exam (written, individual)** and **one final case study (group report & presentation)** to be completed by all students during the designated time periods **in-person**. The midterm exam will be **open-book**.

LEARNING OUTCOMES

By the end of this course, the students will be able to achieve the following **learning objectives**:

- Define and describe key concepts of industry ecology
- Understand how industrial ecology as a framework can be applied for the consideration of sustainability-related aspects of science, technology, and policy
- Demonstrate the knowledge and hands-on skills of applying major industrial ecology methods to case studies
- Communicate effectively with different stakeholders involved in an industrial system

LEARNING MATERIALS

None

Other Course Materials Open-access text books:

- LCA: [Life cycle assessment: Quantitative Approaches for Decisions that Matter](#)
- IOA: [Handbook on Supply and Use Tables and Input Output-Tables with Extensions and Applications](#)
- Resource efficiency: [Resource Recovery from Water: Principles and Application \(2022\)](#)
- Bioeconomy:
 - [Forest Bioeconomy and Climate Change \(2022\)](#)
 - [A Sustainable Bioeconomy: The green industrial revolution \(2017\)](#)
- Access to additional learning materials, such as videos, reading materials and tools, will be provided by the instructor

LEARNING ACTIVITIES

Before each lecture

- Lecture topics may be supported by pre-lecture quizzes and surveys to gauge student's knowledge of topics to be discussed. Correct and incorrect answers will be identified during the lecture, but students will get full marks just for the participation.

During each lecture

- Slides presentation: to cover the key concepts, theory and examples; serves as the basis for other learning activities
- In-class discussions: to create a group environment for students to share thoughts and work collectively on a given problem
- Polling (e.g., Sildo[®], Padlet[®]): another activity to encourage the participation of students

After each lecture

- Additional learning materials: these *optional* learning materials include videos, short articles and exercises, which are intended for students to explore additional topics and gain knowledge beyond the content covered by the lecture.
- Assignments: for students to reinforce their learning outcomes and gauge their progresses.

Assignments for each week

Release time in a week	Purpose	Grading	Expected time to finish (min)	Submission deadline
After 2 nd lecture (Thursday)	<ul style="list-style-type: none"> • Reinforce the learning outcomes • Self-assessment 	Graded	60	By 11:59 pm on Sunday of the following week

SCHEDULE OF LEARNING TOPICS

Note that all deadlines, dates and times are given in Pacific Standard Time (PST). Contact your instructors to discuss any adjustment needed to accommodate your time zone.

Please refer to the “BEST 402_2022 W2_schedule.xlsx” on Canvas

ASSESSMENTS OF LEARNING

The students are evaluated through the **pre- and in-class participations (e.g. surveys, discussions, tutorial deliverables), post-lecture assignments, one midterm exam and one final case study**. The requirements of midterm exam and the final case study are at the same level of easiness as the examples shown in lectures, tutorials and assignments.

Assignments will be due at specific dates specified in Canvas. Late assignments will be penalized 10% of the total possible points for each day past the due date. Once the graded assignments are returned to the other students, late assignments will automatically receive a grade of 10% but they still need to be handed in to pass the course. Students cannot pass the course unless all assignments are submitted for grading, no matter how late they are. Grades will be allocated following the distribution below:

Assessments to student learning include the following components in this course. Each component must be passed to successfully complete the course and receive credits. The passing grade is 50%.

Components	Weight
Assignments	20%
Course participation	20%
Mid-term exam	30%
Final case study	30%

Student final letter grade will be given based on the following:

Letter Grade	Percentage
A+	90% - 100%
A	85% - 89%
A-	80% - 84%
B+	76% - 79%
B	72% - 75%
B-	68% - 71%
C+	64% - 67%
C	60% - 63%
C-	55% - 59%
D	50% - 54%
F (Fail)	0% - 49%

Policies on Late Submissions and As per UBC policies, make-up tests, quizzes, or assignments will **only** be permitted in the case of extreme illness, which requires a doctor's note pertaining to that day, or death in the family, which also requires appropriate documentation.

Participation in the learning activities are required and will be evaluated based on the following:

- Submission of pre-lecture quizzes and surveys. 100% of the points will be awarded to students who complete the quizzes and surveys on time, regardless of how many correct answers. 0% of the points will be awarded for a late or missed submission
- Attendance of lectures and tutorial sessions is required.
- Participation in interactive activities, such as in-class discussions and polling, is strongly encouraged.

UNIVERSITY POLICIES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.

Details of the policies and how to access support are available on [the UBC Senate website](#).

Code of conduct

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in total loss of points in an assignment, exam or entire course, and will be referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

To fully understand what plagiarism means and avoid it please visit:

<http://learningcommons.ubc.ca/resource-guides/avoid-plagiarism/>

For a broader guide on general student conduct, go to:

<https://students.ubc.ca/campus-life/student-code-conduct>

OTHER COURSE POLICIES

Learning Analytics

Learning analytics includes the collection and analysis of data about learners to improve teaching and learning. This course will be using the following learning technologies: Canvas. The tool may capture data about your activity and provide information that can be used to improve the quality of teaching and learning. In this course, I plan to use analytics data to:

- View overall class progress
- Track your progress in order to provide you with personalized feedback
- Review statistics on course content being accessed to support improvements in the course
- Track participation in discussion forums
- Assess your participation in the course

Copyright

All materials of this course (course handouts, lecture slides, assessments, course readings, etc.) are the intellectual property of the Course Instructor or licensed to be used in this course by the copyright owner.

- **Redistribution of these materials by any means without permission of the copyright holder(s) constitutes a breach of copyright and may lead to academic discipline.**
- **Unauthorized recording of the lectures is prohibited**