

CEE 6355 Syllabus

Industrial Ecology in Environmental Engineering, CEE 6355, 3 Credits
Fall 2026

Instructor Information

Instructor

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Email

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General Course Information

Description

Introduces the principles of environmentally conscious products, processes, and manufacturing systems.

Course Learning Outcomes

Upon successful completion of this course, you should be able to:

- **Explain** the principal components of sustainability and how they relate to Industrial Ecology tools
- **Explain** the role that Industrial Ecology plays in bringing about sustainable outcomes.
- **Identify** which Industrial Ecology tools should be used given key environmental aims.
- **Calculate** system-level environmental externalities.
- **Apply** course skills in a project that helps to move society toward a more sustainable future.

Required Course Materials

Below lists the required course material(s):

TEXTBOOK[S] (required):

- Theis, T.L. and Tomkin, J. (2015). [*Sustainability: A Comprehensive Foundation*](#). OpenStax CNX. Open-Access Textbook.
- Brunner, P.H. and Rechberger, H. (2016). [*Handbook of Material Flow Analysis: For Environmental, Resource, and Waste Engineers*](#). CRC Press.
- Matthews, H.S., Hendrickson, C.T., and Matthews, D.H. (2014). [*Life Cycle Assessment: Quantitative Approaches for Decisions That Matter*](#). Open-Access Textbook.

CASE STUDIES (required):

Access info to be provided by the Instructor. Students will use the provided access info via the [Georgia Tech Library](#).

SUPPLEMENTARY READINGS (optional):

- Bozeman III, J.F. and Theis, T.L. (2020). [Sustainability](#). AccessScience from McGraw-Hill.
- Fox-Penner, P. (2010). "Smart Power: Climate Change, the Smart Grid, and the Future of Electric Utilities". Island Press.
- Lindeburg, M.R. (2014). "Environmental Engineering Reference Manual for the PE Exam". Third Edition. Professional Publications, Inc.

Grading Policy:

This course is 3 credit hours, where your anticipated time commitment is an average of 9 hours of in- and out-of-class work each week.

ASSIGNMENTS AND GRADING COMPONENTS:

- Attendance and Participation: 10%
- Midterm: 25%
- Homework: 25%
- Final Project: 40%.

GRADING SCALE:

- **A: 90% - 100%** (Any percentage above 100% will still be considered an A grade)
- **B: 80% < 90%**
- **C: 70% < 80%**
- **D: 60% < 70%**
- **F: < 60%**

- **Pass/Fail Option** (please ensure this option counts toward your personal graduation path before considering): To "Pass" you must earn a B equivalent on the grading scale.
- **Auditees** (please be aware that this option yields no direct credit towards graduation): Assignments and exams are not required or input for a grade.

Description of Graded Components

Below are summaries for each grading component from above (1-4):

1. **Attendance and Participation:** Please see the "Attendance and/or Participation" section below for details.

2. **Midterm:** This is a midterm exam of 5 questions with several subparts. The is a written exam that is administered during regular class time.
3. **Homework:** You will do several homework assignments on a range of industrial ecology subject matter.
4. **Final Project:** You will develop and design your own industrial ecology research effort culminating in a full manuscript. You will have the option to choose your own group members and, in some specialized cases, perform your final project as a solo project. You will also have to present your manuscript content in a 'public' setting.

USG Required Course Policies

Attendance and/or Participation

This course experience will be enriched by your frequent attendance and engaged participation. The Instructor will monitor class attendance in various ways each class. At least one percentage point will be deducted for every two consecutive classes missed without an excused absence (i.e., acknowledgement following the [Student Absence from Class Due to Illness or Personal Emergencies policy](#)); up to 10% loss for that individual.

Disruptive or disrespectful behavior will not be tolerated. It often distracts your classmates from learning and engaging comfortably. The expectations are that you will:

- Conduct yourself as a professional.
- Come to class ready to participate and learn. Cellular phones or other mobile devices must be silenced and out of sight unless directly applicable to class activities. Laptops or the like are permitted if they are used for class activities and not disruptive.
- Bring your curiosity with you to class and ask questions freely. If I don't know the answer, I'll try to find out.
- Submit work that is neat, complete, and easy to follow. This is good practice as you progress as a professional.

Violation of these standards that follow the first written warning from the Instructor will result in a percentage point deduction for each incident thereafter; up to 10% loss for that individual in these cases.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review [Georgia Tech's Honor Code](#) and the student [Code of Conduct](#).

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Core IMPACTS

Below are the primary career-ready competencies that you will develop during this course:

- **Critical Thinking:** Making decisions and solving problems through the use of logic and reasoning to identify the strengths and weaknesses of alternative solutions, and draw conclusions, or approaches to challenges.
- **Inquiry and Analysis:** A systematic process of exploring the world through the collection and evaluating relevant evidence, and using this evidence to support informed conclusions.
- **Intercultural Competence:** The ability to develop knowledge, skills and behaviors that support effective and appropriate interaction in a variety of cultural contexts.
- **Teamwork:** Build and maintain collaborative relationships to work effectively toward common goals, while appreciating diverse viewpoints and shared responsibilities.
- **Perspective-Taking:** Considering perspectives other than one's own and allowing new information, differing opinions, and others' experiences to impress upon one's thinking, understanding, and appreciation of others.
- **Problem-Solving:** Problem solving is the process of designing, evaluating, and implementing a strategy to solve problems using data, knowledge and facts.
- **Information Literacy:** The ability to recognize when information is needed and how to locate, evaluate, effectively use, and synthesize the needed information, and appropriately credit original material.
- **Time Management:** Behaviors that aim at achieving an effective use of time while performing certain goal-directed activities and the ability to prioritize and structure tasks, resources, and time.

Additional Georgia Tech Required Policies

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, [contact the Office of Disability Services](#) (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. [The Student-Faculty Expectations](#) articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

PREREQUISITES:

Not Applicable

COURSE AFFILIATIONS:

This course is an approved elective for graduate engineering students, and an approved elective for the graduate Construction and Infrastructure Systems Engineering track.

OTHER IMPORTANT POLICIES:

GETTING HOMEWORK HELP OR THE LIKE: We will be using Piazza. This Canvas-based system is highly catered to getting you help fast and efficiently from classmates and the TA. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. If you have any problems or feedback for the developers, email team@piazza.com.

USING ARTIFICIAL INTELLIGENCE (AI) TECHNOLOGY: AI tech and tools are all around us and you've likely used them before whether you know it or not. It is acceptable to use AI tech to aide your course efforts (e.g., looking for Final Project research leads or data/information entry points). However, using AI tech to directly create your assignment content (e.g., Final Project written report or pertinent written assignments/homework) could be considered plagiarism, unethical, and/or may violate the Honor Code (please see "HONOR CODE" section below for more details). If you are ever confused on when its use is ethical or in potential violation, please ask the Instructor for clarity (e.g., during office hours) before completing or turning in your assignment(s).

SAFE SPACE AND DIVERSITY STATEMENT: All persons will be respected and should feel comfortable to ask whatever questions they have. Furthermore, this classroom environment is a place where you will be treated with dignity and respect, welcoming individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability and other visible and non-visible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member. Please feel free to schedule office hours with the Instructor if there is a concern or question you feel needs to be asked privately.

Here are some inviting actions that can help provide a comfortable environment (please see below):

- Let the Instructor know your name or pronouns if they have been mistaken.
- Let the Instructor know if something that is happening in class has made you uncomfortable, even if the Instructor is presumed to be the primary reason for your discomfort.

HONOR CODE: Academic integrity is expected of all students. Anyone suspected of cheating or plagiarizing – such as on individual homework assignments and exams - can be reported to the Office of Student Integrity, which would investigate the incident and identify the appropriate penalty for violation. It is important to note that suspicion of cheating and plagiarizing differs when group project work is developed and/or submitted. The Instructor expects shared writings and content in the context of specified group project work.

For any questions involving these matters or any other Academic Honor Code issues, please ask the Instructor during office hours. For further information on Georgia Tech's Academic Honor Code, please visit [this link](#) or [this one](#).

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES: If you require special accommodation(s), please contact the Office of Disability Services at (404) 894-2563 or via [this link](#) as soon as possible. Through this, an appointment should be made to discuss your particular needs and to obtain an accommodations letter. Please email the Instructor soon after receipt to discuss.

RECORDINGS OF CLASS SESSIONS: Classes may not be recorded by students without the express consent of the Instructor unless it is pursuant to an accommodation granted by the [Office of Disability Services](#). Class recordings, lectures, presentations, and other materials posted on Canvas are for the sole purpose of educating the students currently enrolled in this course.

Students may not record or share the materials or recordings - including screen capturing or automated bots - unless the Instructor gives explicit permission. Digitally proctored exams may require students to engage the video camera, but those recordings will not be shared with or disclosed to others without consent unless legally permitted.

- For classes where participation is voluntary, students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded.
- For classes requiring class participation, if students are identifiable by their names, facial images, voices, and/or comments, written consent must be obtained before sharing the recording with persons outside of who is currently enrolled in the class.

ILLNESS CONSIDERATIONS: Please refer to the [Student Absence from Class Due to Illness or Personal Emergencies](#) resource.

OFFICE HOURS: You are encouraged to use Instructor Office hours. When doing so, please keep these principles in mind: (1) Make sure you have read the assigned material(s) and attempted the work before seeking assistance from the Instructor (e.g., please use [Piazza and the other Canvas resources](#) for this); (2) Asking for help early is always better than asking later; and (3) When asking for an appointment outside of the standing in-person office hours, please speak with the Instructor in-person before or after class time, if at all possible, and email the Instructor with at least three date-time options.

PERSONAL SUPPORT RESOURCES: There are a multitude of resources available to you. You are encouraged to utilize these resources at your leisure or when you feel they are needed. A listing of some are: the [Counseling Center](#), [STAR Services](#), [Stamps Health Services](#), [Veterans Resource Center](#), and the [Georgia Tech Police](#) (call 404-894-2500).