



# CIEG465: Global Sustainable Engineering (Credits: 3)

Fall 2022

M/W 5:00-7:30 pm, ISE 222

## 1. Instructor Information

Jennie Perey Saxe (she/her) | 343A DuPont Hall | Email: [jpsaxe@udel.edu](mailto:jpsaxe@udel.edu) | 302-831-2446  
[LinkedIn](#) | [Instagram @ProfSaxe](#) | [Faculty profile](#) | [Website](#)

### Student hours:

**Scheduled in-person:** Tuesday 12-1pm, Wednesday 10:30-11:30am

**Scheduled virtual via Zoom ([LINK](#)):** Mondays 2-3pm (*day/time may change based on student need; or an additional virtual day/time may be added*)

**Drop-in:** anytime I'm in my office

**By appointment:** I encourage you to send me an email to schedule an in-person or virtual appointment if the times above do not work for you. We will find a time that works!

*Welcome to Global Sustainable Engineering! In this class, we'll look at traditional environmental engineering challenges of water quality, air pollution, and more through the lens of sustainable development. I'll also emphasize important practices of project planning and community involvement that are necessary for development projects to be successful. People-centered project development is one way to ensure that community needs are met. People across the world – and even here in the US – do not have equitable access to clean water, clean air, and proper sanitation. The class will emphasize the need to listen, let communities lead, and not presume that we, as engineers, automatically know the best solution for a community that we are not a part of. Empathy and engineering can and should exist.*

## 2. Course Description

In this course, we will apply a sustainability lens to solving environmental challenges in the developing world. We will examine appropriate technologies for use in developing countries as well as examine the cultural implications and economic viability of these technologies. We will cover technical content related to water, sanitation, renewable energy, and waste management through interactive lectures and team projects.

### Course Delivery

We will meet in-person. *Due to the course calendar and holidays, we will not meet in person for the first two weeks of class. During that time, I will use Canvas videos, activities, and discussions to introduce early topics and begin to create a sense of classroom community to give us a productive on-ramp to our first in-person meeting on September 12.*

## 3. Learning Outcomes

### Course Learning Objectives:

As a result of this course, you will be able to:

- Characterize environmental problems in the developing and developed world that engineers can help address
- Identify environmentally, culturally, and economically sustainable solutions to environmental problems
- Apply technical design skills to formulate solutions to environmental challenges facing communities, using local materials and working within economic, geographic, regulatory, and cultural parameters

In addition, this course is intended to meet the following ABET outcomes:

- 2) An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- 4) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- 5) An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- 7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

#### Statement on the FE Exam

All students are encouraged to take the Fundamentals of Engineering (FE) Exam before graduating. Find out more about the exam, including how to register, [here](#). Additional FAQs about the exam can be found [here](#).

## 4. Learning Resources

### Required Learning Materials

Field Guide to Environmental Engineering for Development Workers: Water, Sanitation, and Indoor Air (Mihelcic, 2009). ISBN-13: 987-0784409855 ISBN-10: 0784409854 (Access as an ebook through the [UD library website](#).) Any readings beyond the required learning materials are noted in the syllabus.

### Technology

**Canvas:** In this class, I will use Canvas, UD's online learning management system, for course activities and communication. I will post all assignments through the Canvas course site unless otherwise directed. Information on how to use Canvas is available through the [Canvas Student Guide](#). You can also access Canvas via [MyUD](#).

**Zoom:** In this class, I will use Zoom for office hours and other video conferencing. The link for office hours is on the first page of the syllabus. Zoom is a web-based application that can be used from a computer, tablet, or phone. From a computer, click the class web link and be sure to install the small program that will download to your computer. You only need to install the program once. From a mobile device, download the free Zoom app and type in the class meeting ID number. A microphone and camera are recommended for online meetings. Information on how to test your computer's audio and video can be found on [Zoom's website](#). Learn more info about [Zoom at UD](#).

**Poll Everywhere:** We will use this online polling platform to collect real-time responses from everyone attending class. Access to Poll Everywhere is possible by using any computer or mobile device with internet access. Poll Everywhere is a UD licensed tool and there is no cost to you to use this tool. Please read over the [UD student guide](#) that will demonstrate how to log in and how to respond to polls. As a reminder, the [UD academic honesty policy](#) applies to the use of educational technology tools such as Poll Everywhere.

## 5. Learning Assessment

<b>Your final course grade will be calculated using the following components:</b>	<b>Percentage of total:</b>
<b>Project:</b> a separate handout covering the project will be provided • Project scope 5% • Assessment 10% • Implementation (preliminary design) 10% • • Sustainability assessment 10% • Monitoring and evaluation 10% • Presentation: 10% • • Peer review 5% •	60%
<b>Quizzes</b> (2 @ 10% each): will be held in class (for a portion of class time)	20%
<b>Engagement:</b> consists of graded discussions, one solved exam problem per module, and other Canvas activities (for example: surveys and similar)	20%

## Late policy

I will provide you with adequate time to complete assignments. Therefore, I will generally not accept late project-related assignments. If you think you will have difficulty meeting a project-related deadline, please let me know as soon as possible so that we may discuss. Similarly, I will generally not award points for Canvas engagement assignments (described under “engagement” above) after the posted due date.

## Questions about grading

If you have a question about grading of (i.e., points awarded/deducted) an exam or other assignment, see me within one week of receiving the graded assignment. After one week, I will not entertain grade changes.

## Grading Scale

You will earn the following letter grade based on the calculation coming from the learning assessment section.

Grade	Interval	Grade	Interval	Grade	Interval
A	94.50 and over	B-	79.50 to 82.49	D+	66.50 to 69.49
A-	89.50 to 94.49	C+	76.50 to 79.49	D	62.50 to 66.49
B+	86.50 to 89.49	C	72.50 to 76.49	D-	59.50 to 62.49
B	82.50 to 86.49	C-	69.50 to 72.49	F	Below 59.49

## 6. Course Calendar

I will communicate with the class any changes to this schedule or to due dates. (Link to the [official UD academic calendar](#).) These due dates, and due dates for engagement activities, are also posted on Canvas.

Weeks of:	Topic(s)	Related reading	Project element & due date
8/29 and 9/5	Module 0: Course introduction Module 1: Context for engineering in a global perspective*	<a href="#">UN 2030 Agenda for Sustainable Development</a> (pages 1-13)	
<i>Because of the academic calendar and Labor Day holiday, we will not meet in person until the third week of classes. Material related to Module 1 will be covered on Canvas and reviewed in our first in-person meeting on September 12.</i>			
9/12	Review of Module 1 Project introduction		
9/19 and 9/26	Module 2: Project management ***Guest speaker on 9/26***	Field Guide Chapter 4	9/25: project scope due
10/3	Module 3: Sustainability		
10/10 and 10/17	Module 4: Water and wastewater	Field Guide Chapters 9, 11, 14, 17-22	10/9: assessment plan due
10/24	Module 5: Solid waste	Field Guide Chapter 24	10/23: implementation plan and preliminary design due

Weeks of:	Topic(s)	Related reading	Project element & due date
10/31	Module 6: Mapping ( <i>weather permitting</i> ) <b>Quiz #1 (Modules 1-4)</b>		
11/7	Module 7: Air pollution	Field Guide Chapter 25	11/6: sustainability assessment due
11/14	Module 8: Construction materials and methods  *** <i>Guest speaker</i> ***		
11/21	Thanksgiving break		
11/28	Module 9: Food-water-energy nexus  Module 10: Climate adaptation and capacity building	<a href="#">IPCC Climate Change 2022: Impacts, Adaptation, and Vulnerability – Summary for Policymakers</a>	11/27: monitoring and evaluation plan due
12/5	Project presentations		12/8: peer reviews due
FINALS WEEK	<b>Quiz #2 (Modules 5-10)</b>		

*My lectures and course materials (syllabi, PowerPoint presentations, exams, homework assignments, video recordings, and similar materials, are protected by U.S. copyright law. You may take notes and make copies of course materials for your own personal use or for another student who is registered and enrolled in this course. You may not reproduce, distribute, or display via posting or uploading lecture notes/recordings/other course materials in any other way without my express written consent, nor may you allow others to do so. Doing so may be in violation of the University of Delaware student code of conduct. (Language adapted from UC Santa Cruz.)*

# 7. Course Policy Document

## Instructor Policies

I have a goal of maintaining an inclusive and engaging classroom environment. I encourage dialogue and questions, as well as respect for students and the instructor, in both in-person and online discussions. **Cell phone use is permitted for answering poll questions. For non-polling portions of class meetings, please do not use cell phones or earbuds out of respect for your instructor and classmates.** The use of laptops for notetaking or class activities is permitted.

I will make every effort to avoid changing the course schedule but the possibility exists that unforeseen events will make changes necessary. I will reserve the right to make changes to the syllabus as necessary. I will notify you in a timely manner of any syllabus changes via announcements on the course Canvas site. Please make sure your settings on Canvas are set to send you emails of posted announcements.

## Communication

**When in doubt, communicate.** I will typically send messages to the class as Announcements through Canvas; please check your Canvas settings to ensure you receive these messages. In addition, I welcome communication via email and phone, or in person during office hours or during a scheduled appointment. I will respond to all emails in a timely manner, however, please do not expect that email will be returned immediately.

## Attendance

I have specially designed in-class activities to help you achieve learning objectives. Attendance is critical to achieve the course learning objectives. However, absence and tardiness are not acceptable reasons for late or missing assignments. Communication is critical in regard to attendance. **Let me know in advance if you anticipate missing a class or if you will have an absence that will make completing the group semester assignment difficult. If you feel ill, please stay home.**

Absences on religious holidays listed in university calendars are recognized as an excused absence. Nevertheless, I urge you to remind me of your intention to be absent on a particular upcoming holiday. Absences on religious holidays not listed in university calendars, as well as absences due to athletic participation or other extracurricular activities in which students are official representatives of the university, shall be recognized as excused absences when you inform me (in writing) during the first two weeks of the semester of these planned absences

## Student Mental Health & Wellbeing

In addition to impacting your overall well-being, diminished mental health can interfere with optimal academic performance. If this course is causing or contributing significant mental or emotional stress, then please reach out to me directly. However, problems with other parts of your life can also contribute to decreased academic performance. UD's Center for Counseling & Student Development (CCSD) provides cost-free and confidential mental health services to help you manage personal challenges that threaten your emotional or academic well-being. Remember, getting help is a smart and courageous thing to do -- for yourself and for those who care about you.

- **Contact me:** If you are struggling with this class, please check-in during office hours or contact me by email at [jpsaxe@udel.edu](mailto:jpsaxe@udel.edu)
- **Check in with your academic advisor:** If you are struggling in multiple classes, unsure whether you are making the most of your time at UD, or unsure what academic resources are available at UD.
- **UD's Center for Counseling & Student Development and UD Helpline:** CCSD is open and available remotely, and 24/7 mental health support remains available on the UD Helpline at 302-831-1001 for any student in need of someone to talk to. Visit [CCSD's website](#) for additional information and resources.
- **UD's Crisis Text Line:** Text "UDTEXT" or "STEVE" at 741741 for students of color to connect with confidential text message support.
- **Division of Student Life:** Explore the Student Life's [Wellbeing webpage](#) for a comprehensive listing of well-being resources, activities and services available to all students.

# UD Academic Policies

## The Safety of Our Learning Environment

Student learning can only occur when students and their instructors feel safe, respected, and supported by each other. To ensure that our learning environment is as safe as possible, you are expected to abide by the most up-to-date [University of Delaware's COVID-19 Guidelines](#),

## Academic Integrity

Please familiarize yourself with UD policies regarding academic dishonesty. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, to re-submit the same assignment for different classes, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither give nor receive unauthorized assistance. View the [university's academic integrity policies and procedures](#). Office of Student Conduct, 218 Hulliher Hall, (302) 831-2117. E-mail: [student-conduct@udel.edu](mailto:student-conduct@udel.edu)  
Harassment, Discrimination, and Sexual Misconduct

The University of Delaware works to promote an academic and work environment that is free from all forms of discrimination, including harassment and sexual misconduct. As a member of the community, your rights, resource and responsibilities are reflected in the Non-Discrimination, Sexual Misconduct, and Title IX policy. Please familiarize yourself with this policy at the [University's Office of Equity & Inclusion's website](#). You can report any concerns to the University's Office of Equity & Inclusion, at 305 Hulliher Hall, (302) 831-8063 or you can report anonymously through UD Police (302) 831-2222 or the [EthicsPoint Compliance Hotline](#).

- Read the [full policy](#)
- [File a report](#)

## Faculty Statement on Disclosures of Instances of Sexual Misconduct

If, at any time during this course, I happen to be made aware that a student may have been the victim of sexual misconduct (including sexual harassment, sexual violence, domestic/dating violence, or stalking), I am obligated by federal law to inform the university's Title IX Coordinator. The university needs to know information about such incidents to, not only offer resources, but to ensure a safe campus environment. The Title IX Coordinator will decide if the incident should be examined further. If such a situation is disclosed to me in class, in a paper assignment, or in office hours, I promise to protect your privacy--I will not disclose the incident to anyone but the Title IX Coordinator. For more information on Sexual Misconduct policies, where to get help, and reporting information, please refer to [www.udel.edu/sexualmisconduct](http://www.udel.edu/sexualmisconduct). At UD, we provide 24/7/365 crisis assistance and victim advocacy and counseling. Contact 302-831-1001 to get in touch with a sexual offense support advocate, as well as confidential and anonymous counseling services for other concerns.

## Accommodations for Students with Disabilities

Any student who may need an accommodation based on a disability should contact the Office of Disability Support Services (DSS) office as soon as possible. For more information, please visit [Getting Registered at DSS](#). Contact DSS by phone: 302-831-4643; fax: 302-831-3261; website: [www.udel.edu/dss](http://www.udel.edu/dss); email: [dssoffice@udel.edu](mailto:dssoffice@udel.edu); or visit 240 Academy Street, Alison Hall Suite 130 during business hours (8-5 M-F).

## Non-Discrimination

The University of Delaware does not discriminate against any person on the basis of race, color, national origin, sex, gender identity or expression, sexual orientation, genetic information, marital status, disability, religion, age, veteran status or any other characteristic protected by applicable law in its employment, educational programs and activities, admissions policies, and scholarship and loan programs as required by Title IX of the Educational Amendments of 1972, the Americans with Disabilities Act of 1990, Section 504 of the Rehabilitation Act of 1973, Title VII of the Civil Rights Act of 1964, and other applicable statutes and University policies. The University of Delaware also prohibits unlawful harassment including sexual harassment and sexual violence.

For inquiries or complaints related to non-discrimination policies, please contact: Office of Equity & Inclusion-  
[oei@udel.edu](mailto:oei@udel.edu), 305 Hulliher Hall Newark, DE 19716 (302) 831-8063

For complaints related to Section 504 of the Rehabilitation Act of 1973 and/or the Americans with Disabilities Act, please contact: Office of Disability Support Services, [dssoffice@udel.edu](mailto:dssoffice@udel.edu), Alison Hall, Suite 130, Newark, DE 19716 (302) 831-4643 OR contact the [U.S. Department of Education - Office for Civil Rights](#)