

Advanced Principles in Environmental Science

ENR 6100 (3 Units): T and TH: 9:35-10:55am (Online)

Spring 2022

Instructor: Dr. Christine Sprunger
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Office hours: Upon Request

Course description: This course will cover principal concepts of environmental science including global environmental challenges ranging from water quality, global climate change, to land use change. A major focus of the course will be to understand different global nutrient cycles and their linkages to pressing environmental issues. To this end, the biogeochemistry, food web dynamics, and abiotic and biotic factors of key ecosystems (forests, grasslands, wetlands, freshwater and marine environment) will be explored when discussing different environmental issues.

Course goals: The primary goals for this course are to 1) introduce students to foundational principles within environmental science and 2) provide information that will help students apply ecological and social science frameworks required to manage critical air, soil, and water resources. Lectures will address basic ecological principles, case studies, and empirical approaches used to understand society's most pressing environmental issues.

Learning Outcomes:

1. Describe principles of the natural environment including nutrient cycling, biodiversity, and soil food webs and understand the mechanisms that control major global challenges.
2. Explain how key biogeochemical cycles are critical to solving pressing environmental problems.
3. Compare and contrast case studies highlighting the management of ecosystems and assess the application of basic ecological principals to current environmental problems.
4. Explore interdisciplinary approaches required for managing key ecosystems and solving environmental issues.

Who should take this course?

This course is geared for students who want to gain foundational knowledge in environmental science and learn about the connections between key environmental challenges and global nutrient cycles. This course will likely be most appropriate for students enrolled in the Professional Master's in Environment and Natural Resources (MENR) program within SENR and

for students with social science backgrounds that need to fulfill natural science course requirements. Students wanting advanced knowledge of a particular sub-discipline should consider enrolling in other more disciplinary focused graduate level SENR courses. Students are encouraged to contact the instructor to discuss if this course is appropriate for their plan of study.

Required Course Materials:

1. All required readings will be posted on Carmen.

Class Schedule and Assignments

Week	Class Topic
1	Course introduction; global environmental challenges
2	The global water cycle and water resource issues
3	The nitrogen cycle, food production and water quality issues in the agricultural Midwest
4	The phosphorus cycle and policies surrounding the Lake Erie water basin
5	Nutrient cycling and eutrophication in marine environments
6	The atmosphere, air pollution, toxins
7	Global nitrogen deposition; sulfur and acid rain
8	Mid-term
9	The global carbon cycle -terrestrial; deforestation, land degradation, habitat loss
10	The global carbon cycle-oceans; acidification
11	Biodiversity and biogeochemistry at macro and micro scales.
12	The biogeochemistry of climate change
13	Ecological principles of conservation and sustaining ecosystems
14	Socio-economic frameworks and ecosystem services
15	Course wrap up and writing sessions
16	Final Term Paper Due

Grading and faculty response

How your grade is calculated:

ASSIGNMENT CATEGORY	PERCENTAGE
Class participation	10
Reading Reflections	20
Mid-Term Exam	20
Annotated Bibliography	25
Term Research Paper	25
Total	100

Class preparation and participation:

This is a graduate level seminar course, therefore, active participation from all students is crucial and will enhance the learning experience for all. Recognizing that there are multiple ways to participate and contribute toward class discussions, students will be graded on a variety of different activities that assess class preparedness and participation. Such activities will include a mixture of in-class essays and participation in class discussions. Due to the number of in-class activities, attendance and punctuality is crucial.

Reading Reflections:

Students are expected to complete the assigned readings for each class and come prepared to critically discuss them. For a minimum of **10 classes of your choosing**, students are expected to write a reading reflection and submit it through carmen. The reading reflections should be at least *250 words* and include at least *two discussion questions*. The point of these reading reflections is to record your reaction to the readings and/or topic discussed. Are there concepts that you wish to delve into more deeply during class? What surprised you about the readings? Are there connections that you can make to your own work or research that you wish to share? The included questions should demonstrate your ability to think critically and or synthetically about a given topic or reading. Lastly, I will aim to address as many questions as possible either during the lectures or class discussions. **For each class session that you elect to submit a reading reflection, the reflections should be posted on carmen by 11pm the day before class.** Reading reflections are worth 20% of your grade. Ten reflections (2 points each).

Exams:

A take home mid-term exam will be assigned to test student comprehension of topics covered in class. The exam will be a mixture of multiple-choice, true/false, and short-answer and essay

questions. A review session will be given prior to each exam to help students prepare. Given the on-line nature of the course, the exam will be open book with a 90-minute time limit.

Annotated Bibliography:

An annotated bibliography will be assigned following the mid-term exam and will be due in week eleven. The purpose of this assignment is to help students start the process of gathering literature for their term paper and to help start with the initial synthesis of themes and concepts within their chosen topic area. Students will be asked to identify five key scientific articles that they will incorporate into their term paper.

Term Paper:

A term paper is required and will be due at the end of the course. The purpose of this term paper is to give each student the opportunity to enhance their understanding of how nutrient cycles are essential in further understanding a current environmental problem of their choice. Students will also be asked to describe how the environmental issue can be managed using a socio-economic framework. Students will need to demonstrate their ability to think critically and synthesize the scientific literature on this given topic.

Late Assignments:

Unless granted an extension for extenuating circumstances, all assignments must be turned in by the stated due date by the start of class. Each assignment that is turned in late will be marked down one letter grade every 24-hour period it is overdue.

Grading scale

93–100: A
90–92.9: A-
87–89.9: B+
83–86.9: B
80–82.9: B-
77–79.9: C+
73–76.9: C
70–72.9: C-
67–69.9: D+
60–66.9: D
Below 60: E

Faculty feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem.)

- **Grading and feedback:** For large weekly assignments, you can generally expect feedback within **7 days**.
- **E-mail:** I will reply to e-mails within **24 hours on school days**.

Course technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** <http://ocio.osu.edu/selfservice>
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

Required software

- **Microsoft Office 365:** All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found <https://ocio.osu.edu/kb04733>.

Participation and Attendance

Student participation requirements

Attendance and participation are very important for your success in this course. If you have a situation that might cause you to miss class, discuss it with me *as soon as possible*. The following is a summary of everyone's expected participation:

- **Classroom attendance:** Students are expected to attend class twice a week and complete all required readings and assignments before coming to class. Students will get the most out of every lecture by viewing the provided pdf on Carmen.
- **Classroom participation:** In class, we have frequent opportunities to discuss course topics. Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably.
- **Logging in:** Be sure you are logging in to the course in Carmen each week, including weeks with holidays or weeks with minimal course activity. (During most weeks you will probably log in many times.)

Other course policies

Academic integrity policy for this course

- **Written assignments:** Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow [MLA/APA/] style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in--but no one else should revise or rewrite your work.
- **Reusing past work:** In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.
- **Falsifying research or results:** All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.

Ohio State's academic integrity policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of*

Student Conduct and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages ([COAM Home](#))
- *Ten Suggestions for Preserving Academic Integrity* ([Ten Suggestions](#))
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Title IX

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options at titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu. Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information on OIE, visit equity.osu.edu or email equity@osu.edu.

Your mental health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling (614) 292- 5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at 614.292.5766 and 24 hour emergency help is also available through the 24/7 National Prevention Hotline at 1.800.273.TALK or at suicidepreventionlifeline.org.

Diversity and Inclusion

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

Accessibility accommodations for students with disabilities

Requesting accommodations

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307, 098 Baker Hall, 113 W. 12th Ave.