

Biology 3460: Global Environmental Issues

Fall 2021

Dr. William Anderegg

Welcome to Global Environmental Issues. Global changes are occurring that impact biological systems. In this course, we will study the impacts of climate change, altered hydrologic and nutrient cycles, land-use changes, introductions of non-native and invasive species, and other human-related activities on the Earth's biological and ecological systems. Emphases are placed on evaluating information; understanding linkages between biological and physical processes; the impacts of humans on the functioning of ecosystems; and consideration of both impacts and solutions to global environmental challenges. Current global issues, such as climate, biodiversity, sustainability, and ecosystem goods and services are examined from a scientific basis with the goals of understanding impacts and proposed solutions that will influence both natural systems as well as human societies in the 21st century and beyond. I hope that this course will be enjoyable and informative to you.

The course is 3 credits and includes a community engaged learning (CEL) component, with Dr. Amanda Hoepfner. Dr. Hoepfner is in charge of the CEL portion of the class; therefore, questions regarding CEL should be directed toward her. This class has no pre-requisites. It fulfills the University of Utah International Requirement (IR) and Physical/Life Science Exploration (SF).

Format

For Fall 2021, this course will be **fully online**. You will complete a "module" each week on Canvas that will involve a set of videos, activities, and assignments. All of these module components can be done at any point during the week – in other words, you do not have to do them during scheduled class hours. However, **all scheduled mini-exams and a final CEL discussion will occur during scheduled class hours** every other Thursday at 9:10 AM, and thus you should keep those times available to participate in those activities. These required synchronous (i.e. during class hours) activities and exams are in RED on the syllabus. There will not be make-up opportunities of those activities/exams.

Expected Learning Outcomes

As an interdisciplinary biology course, the learning objectives of this course are:

1. To reinforce student knowledge of concepts in ecology, so they can describe how the principles of natural selection and mechanisms of genetic change led to the observed diversity of life and how these processes influence ongoing biological responses to rapid environmental change.
2. To reinforce student knowledge of systems-level concepts, including interactions within ecological cycles, so that students can explain how natural systems function and how humans and global changes impact organisms and ecosystems
3. To increase student knowledge of the societal impacts of environmental problems, so that

- students can explain how environmental impacts are distributed in space and time and the manifold implications this has for justice and equity
4. To further develop collaboration skills through group projects, presentations, and exam preparation so that students can apply concepts and interdisciplinary knowledge from within and outside of biology to interpret biological phenomena, communicate, and work collaboratively to solve problems
 5. To further expose students to the interactions between science and society, including the application of ecological knowledge to evaluate those interactions
 6. To further develop writing skills through scientific writing assignments and feedback

Course Logistics

Meeting Times

Lecture content and activities: Asynchronous, Canvas

Mini-Exams: Thursdays, Sept 2, 16, 30, Oct 21, Nov 4, 18, 9:10 – 9:40 a.m., Canvas

Instructor

William Anderegg, Ph.D., anderegg@utah.edu. Office hours: Tuesdays and Thursdays 10:30 – 11:00 a.m., or by appointment, in South Biology (SBB) room 210B. I will be available and respond to emails between 8 AM – 4 PM weekdays.

Community Engagement Coordinator

Dr. Amanda Hoepfner, amanda.hoepfner@utah.edu, Office: virtual, email for appointment

Teaching Assistants

Annapurna Post-Leon

Annika Quist

Emily Young

- TAs can be reached via class Canvas page

Course Materials

This class is based on material presented in modules posted on Canvas. There is no textbook. Educational information is based on what you learn in Canvas modules that combine a few short mini-lectures and an activity or two.

Grading

Mini-exams 35% (6 total, lowest score dropped, 7% of final grade x 5 exams counted)

Final exam 15%

Community Engaged Learning 15%

Class participation 25%

Scientific writing assignment 10%

Students are not competing with each other for a grade. The percentage point cutoffs for letter grades will be determined at the conclusion of the semester based on student performance.

Cut-offs will be no greater than the following:

A >93, A- 90-92, B+ 87-89, B 83-86, B- 80-82, C+ 77-79, C 73-76, C- 70-72, D+ 67-69, D 63-66, D- 60-62, E/F <60%

Course Work Details

Mini-Exams and Final Exam

There will be six Mini-Exams throughout the semester, **held on Canvas from 9:10-9:40 AM on every other Thursday (Sept 2, 16, 30, Oct 21, Nov 4, 18)**. The Mini-Exam can only be taken during this window. They will not be cumulative. Topics covered in the modules will be used to create the exams. The majority of the questions will be multiple choice but will include a few “short response” (2-4 sentences) questions. Be prepared to think critically and synthesize ideas and concepts, rather than just regurgitating information. There will be no make-up exams. All exams are open-note. You will have one week from the time a graded exam is returned to discuss its scoring with the instructor. Your lowest Mini-Exam score will be dropped and the remaining five Mini-Exams will constitute 7% of your final grade each (total 35%).

The Final Exam will be on Wednesday, Dec 15th from 8-10 AM. As with the Mini-Exams, it will be on Canvas only during that window and will be open note. The Final Exam will be cumulative and is worth 15% of your final grade.

Class Participation

Class participation is crucial for succeeding in this course and thus constitutes 25% of your final grade. Class participation will be graded by completion of modules and their required activities on Canvas. **Module components for a given week must be completed by 11:59 PM on Sunday of that week to count for your class participation grade.** Module assignments will be graded as full, half, or zero credit. There are 13 modules total in the course. Your participation grade will be based on your 12 best module scores (~2% of your final grade per module). Thus, you can still get full participation credit if you miss 1 module.

Scientific Writing Assignment

The scientific writing assignment is designed to help you further develop your writing, research, and data evaluation skills. You will be required submit the assignment on Canvas before the beginning of class on the due date. Assignments turned in after class on the due date will be considered late. See Canvas for full details, writing prompt, formatting guidelines, grading rubric. This assignment is worth 10% of your final grade.

Classroom Environment

Classroom inclusion policy: I aim to create a learning environment for my students that supports and prioritizes a diversity of thoughts, perspectives and experiences, and honors your identities (including race, gender, class, sexuality, religion, ability, etc.). To help accomplish this: 1) If you have a name and/or set of pronouns that differ from those that appear in your official University/Canvas records, please let me know! 2) If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with me. 3) Like many people, I am continually learning about and working to better support diverse perspectives and identities. If something was said in class that made you feel

uncomfortable, please talk to me about it. For all of these, anonymous feedback is always an option.

The Americans with Disabilities Act: The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, (801) 581-5020. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

University Safety Statement: The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

Addressing Sexual Misconduct: Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

Student wellness: Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness at www.wellness.utah.edu or 801-581-7776.

Module Schedule Fall 2021 (may change slightly)

Red = synchronous activity that occurs during scheduled class hours

Dates	Module
Setting the Stage for the Anthropocene	
Aug 23 - 29	Week 1: Introduction
Aug 30 - Sept 5	Week 2: Setting the Stage for the Anthropocene I
Sept 2	Mini-Exam 1
Sept 6 - 12	Week 3: Setting the Stage for the Anthropocene II
Environmental Changes on the Land	
Sept 13 - 19	Week 4: Environmental Changes on Land I
Sept 16	Mini-Exam 2
Sept 20 - 26	Week 5: Environmental Changes on Land II
Environmental Changes in the Water	
Sept 27 - Oct 3	Week 6: Environmental Changes in the Water I
Sept 30	Mini-Exam 3
Oct 4 - 10	Week 7: Environmental Changes in the Water II
Oct 11 - 17	FALL BREAK
Environmental Changes in the Atmosphere	
Oct 18 - 24	Week 8: Environmental Changes in the Atmosphere
Oct 21	Mini-Exam 4
Oct 25 - 31	Week 9: Climate Change I
Nov 1 - Nov 7	Week 10: Climate Change II
Nov 4	Mini-Exam 5
Nov 8 - Nov 14	Week 11: Climate Change III
Future Earth: Strategies and Solutions	
Nov 15 - 21	Week 12: Future Earth: Strategies & Solutions I
Nov 18	Mini-Exam 6
Nov 29 - Dec 5	Week 13: Future Earth: Strategies & Solutions II
Dec 6 - 9	Week 14: Wrap-up
Dec 9	In-class CEL zoom presentations
Dec 15	FINAL EXAM: Wednesday, Dec 15th 8-10 AM