

Environmental Science for Informed Citizens

GEOS 043 01, L01 4.0 Units
Fall 2016



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Office hours: after class, or by appointment

Location & time: lecture meets TR, 1:00 to 2:45 PM in the Geosciences Center room 101; lab meets W 1:00-2:50 PM or 3:00-4:50 PM in Geosciences Building room 106. Topics discussed in lecture and lab will be fluid. Please attend all lecture & lab meetings and plan to stay for the entire period. Course requirements include field trips.

Prerequisites: None, this introductory class is a 4 unit, Category III-A (lab science) GE course.

Course objectives

- (1) *To learn to identify and describe the components of & interactions within the Earth System:* Environmental Science is an investigation of how organisms and environments interact. This exploration of environmental systems inevitably includes geology, physics, chemistry, and biology, as well as social and political science and their many sub-disciplines. Studies of environmental science integrate sub-disciplines and cross traditional discipline boundaries to explain benefits to society. This leads us on to objective 2...
- (2) *To develop an understanding of environmental science's relevance to your life:* Most of you are not (yet) Environmental Science majors. Why should you care about Environmental Science? Our society needs a forward-thinking, educated populace capable of understanding global issues and making informed decisions regarding social, economic, and environmental policies. You will need to be able to critically evaluate the information you need to make these decisions, which leads to the next objective...
- (3) *The ability to critically & dispassionately evaluate "facts":* Earth Science underwent a revolution in the 1960's as profound as Einstein's relativity theory was to physics, or the theory of evolution was to biology. So, how do scientific revolutions happen? Find out about the scientific method – and understand the fundamental differences between "research knowledge" and "inherent knowledge". Understanding how scientists "know" things is as important as what they claim to know. This leads on to the final course aim...
- (4) *To look at the world with the skepticism and wonder of a scientist:* If this course was only about learning "facts", we could distill a textbook into an incredibly dull list of definitions and facts. Of course, we will have to learn some definitions, but also learn how to constantly ask yourself (and me) "HOW do we know this?" and "HOW can I apply this way of looking at things to other subjects?" For example, we will emphasize the "systems" approach to the Earth by always looking for how one part of the system affects other parts (e.g. atmosphere, biosphere, oceans, solid Earth). You will leave this class with an increased capacity to integrate information and communicate about the Grand Challenges facing human society including climate change, energy independence, and water resources.

Course policies:

- **"After-the-fact is too late."** NO LATE WORK WILL BE ACCEPTED. Exceptions to this blanket policy are only possible if discussed with me well in advance of an expected conflict and in the presence of adequate documentation of an accepted conflict (doctor's note, letter from instructor, funeral notice, etc.). There are no opportunities to make up missed lectures, so make very effort to attend each scheduled session.
- **Learning Environment:** Please be considerate of your colleagues and their learning environment. I will maintain a safe, comfortable, and effective learning environment for all students. For this reason, all University policies regarding academic freedom, classroom conduct, nondiscrimination, individual rights, and confidentiality are strictly enforced.
- **Cell Phones, tablets, and laptops:** You will occasionally need a web-connected device for class activities. During these times, I expect that you will be working on class activities. Once the activities are completed I expect that you will put your device away for the remainder of class. If I find these devices lead to disruptive behaviors in this class, I will change the policy immediately and no longer allow devices of any kind in class. Exams will be closed notes/closed book.

- Honor Code Policy:** The Honor Code at the University of the Pacific calls upon each student to exhibit a high degree of maturity, responsibility, and personal integrity. Students are expected to: (1) act honestly in all matters, (2) actively encourage academic integrity, (3) discourage any form of cheating or dishonesty by others, (4) inform the instructor and appropriate university administrator if she or he has a reasonable and good faith belief and substantial evidence that a violation of the Academic Honesty Policy has occurred. Violations will be referred to and investigated by the Office of Student Conduct and Community Standards. If a student is found responsible, it will be documented as part of her or his permanent academic record. A student may receive a range of penalties, including failure of an assignment, failure of the course, suspension, or dismissal from the University. The Academic Honesty Policy is located in Tiger Lore and online at <http://www.pacific.edu/Campus-Life/Safety-and-Conduct/Student-Conduct/Tiger-Lore-Student-Handbook-.html>

Course materials and resources:

Lecture Textbooks:

Withgott & Laposata (2014) *Environment: The Science Behind the Stories*, 5e. ISBN-13: 9780321939609 (You need to use this ISBN to ensure you have Mastering access)

Course Website: A Canvas course site (located at <https://pacific.instructure.com>) will be used to enrich your learning experience. Login with your PacificNet ID and password and verify your enrollment. This site will host course information and supplemental materials that you should check out as well as raw grades (see below).

Course structure:

Attendance & Participation: Regular attendance is required and I keep records during *most* lectures. I expect that if you are present, you will participate in the activities during the lecture period. I derive most exam questions directly from lecture materials. Questions in lecture are strongly encouraged and appreciated – please don't be shy about asking questions, because chances are that several other people are wondering the same thing.

Field Experiences: There will be occasional field experiences during the semester. Outings will be scheduled during regular lab time or on the one-day field trip date. I will let you know in advance when you should be prepared to go in the field. During field trips, you will take notes, answer questions, and draw sketches.

Homework & Assignments: I periodically assign in- and out-of-class exercises, which are designed to help you make the connections between what you are learning in class and your daily life. These assignments may include: reading-related assignments, short “back-of-the-envelope” mathematical exercises, internet-research assignments, mini research projects, short essay reflections on geology in literature, abstract writing exercises, and/or field trip notes/reflections.

Labs: Weekly lab exercises are designed to complement (not repeat) lecture topics and prepare students for fieldwork. Labs may occasionally occur before/after related material in lecture due to scheduling and logistics. Students are encouraged to work together in the labs, however, **every student must turn in every lab assignment in their own words** (see Honor Code above).

Projects: You will work on one individual project and one group project over the course of the semester. Details on these projects will follow during week two of class.

Exam Information: One midterm exam (10/13/16) and a comprehensive final exam (12/13/16; i.e., final covers information from entire semester) will test your comprehension of concepts covered in the lecture, laboratory, and field portions of this course, but will focus primarily on lecture material. Exams include true false, multiple-choice, and short answer questions. Makeup exams are only administered to students with valid documented excuses that make all arrangements with me *at least a week before* the exam date. Zero credit will be given for missed exams.

Basis for Course Grade:

Attendance & Participation	15%
Homework & Labs	25%
Projects	20%
Midterm exam	20%
Final exam	20%

Grading scale:

A range	90-100% (A-90-92)
B range	80-89.99% (B-80-82; B+88-89)
C range	70-79.99% (C-70-72; C+78-79)
D range	60-69%
F	<60%

NOTE: I will post scores in the grade book on Canvas, but be advised that these course management sites often are limited in their ability to fine-tune the weights of individual assignments and their contribution to your final grade *AND* often miscalculate the “final grades” that the site reports. Thus, grades posted on Canvas should only be considered a “rough” assessment of your current standing and will NOT BE WEIGHTED. **Copies of student work may be retained for assessment purposes.**

Disability Accommodation: If you are a student with a disability who requires accommodations, please contact the Director of the Office of Services for Students with Disabilities (SSD) for information on how to obtain an Accommodations Request Letter. There is a 3-Step process for establishing an accommodation: (1) Student meets with the SSD Director and provides documentation and completes registration forms, (2) Student requests accommodation(s) each semester by completing the Request for Accommodations Form, and (3) Student arranges to meet with his/her professors to discuss the accommodation(s) and to sign the Accommodation Request Letter. To ensure timeliness of services, it is preferable that you obtain the accommodation letter(s) from the Office of SSD. Depending on course and session, the wait time may be as long as 1-2 weeks or as short as 1-2 days. After the instructor receives the accommodation letter, please schedule a meeting with the instructor during office hours or some other mutually convenient time to arrange the accommodation(s). The Office of Services for Students with Disabilities is located in the McCaffrey Center, Rm. 137. Phone: 209-946-3221. Email: ssd@pacific.edu. Online: www.pacific.edu/disabilities

Tentative schedule (*subject to change – so stay informed and when in doubt, please ask*):

Lecture topics	Readings on Canvas	Deadlines on Canvas
Introduction to class; Science & Knowledge		
Systems		
Plate Tectonics		
Populations & Ecology		
Human Population		
Food & Ag: Land use & soil erosion		
Food & Ag: Water use, carbon, chemicals		
Food & Ag: Feeding 9 billion		
Water: Water cycle		
Water: Surface water		
Water: Groundwater		
Water: Too much or too little; Dams		
Water: Water Quality; Privatization		
Midterm		
Energy: Fossil fuels		
Energy: Nuclear		
Energy: Renewables		
Carbon cycle		
Climate: Geologic		
Climate: Modern		
Anthropocene		
Final - 12/13 12-3pm		

<i>Date</i>	<i>Important event</i>	<i>Date</i>	<i>Important event</i>
8/30	First class meeting	10/13	Midterm
8/31	No lab first week	10/29 & 10/30	Field trip
9/6	Class online	11/15, 11/17, 11/21	Lifestyle Presentations
9/20	Class online	12/1 & 12/6	Project Presentations
9/27 & 9/29	Class online	12/13	Final 12-3pm

Department Level Learning Outcomes Assigned to this Course:

- 1) Understanding of fundamental systems, cycles, processes, and materials of the earth and environment, and understanding of the interactions between and among them.
- 2) Consistent use of the scientific method as a “habit of mind” in approaches to research and problem solving.
- 3) The ability to communicate effectively, orally, in writing, and interpersonally, with a range of professional and public audiences.

University Level Learning Outcomes Assigned to this Course:

- 1) Major field competence.
- 2) Critical thinking.
- 3) Written and oral communication.
- 4) Sustainability.