BI/CH 76
Introduction to Environmental Science

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Course Description

Human populations have been modifying the environment since prehistory. With increased population size and advances in technology, we now have an amazing capability to change the global environment. This course will focus on the science behind major local, regional, and global environmental issues. Through lectures, discussions, writing assignments, and hands-on activities students will use science to navigate the complexity of environmental policies and practices they encounter throughout their lives. In addition, they will learn how environmental scientists approach problems and interact with policy makers and natural resource managers.

Required Materials

1. **Essential Environment: The Science Behind the Stories,** 5th ed. (2015) by Withgott and Laposata
2. Access code for MasteringEnvironmentalScience website, bundled with new copies of the textbook, or available from the publisher's website at pearsonmylabandmastering.com
3. Additional materials available on Fairfield U's BlackBoard system (https://fairfield.blackboard.com) .

Course Objectives

- To introduce students to major environmental issues at local, regional, and global scales;
- To become familiar with a physical, chemical, and biological basis of those issues;
- To develop an interdisciplinary perspective on environmental systems, including the unintended consequences of human impacts;
- To understand how scientific, cultural, and political perspectives interact to inform our understanding and to develop sustainable solutions to these issues; and
- To prepare students to participate actively in the key environmental issues that will affect the quality of life for current and future generations.

Assessment

Class grades will be based on exams, self-graded quizzes, discussions, attendance, participation in course activities, and short writing assignments.

Online homework assignments	25%
Course participation (case study activities, discussion, attendance, co-curriculars, etc.)	10%
Three midterm exams (10% each)	30%
SimBio Virtual Labs (5% each)	10%
Final Exam	25%

Letter grades will be assigned per Fairfield University's Academic Policies.

Preparation for Class Sessions

My expectation is that you will **complete the day's reading before attending class**. We will use readings as a basis for discussion and activities during class meetings. I do not intend for you to memorize the text, but I do expect you to be familiar with the major concepts and new terminology presented in each chapter. In class we will first work through these ideas, and then progress to examples, connections across chapters, and some critiques of the ideas presented in the text.

To help you work with the textbook material and prepare for class sessions a set of homework assignments are hosted on the MasteringEnvironmentalScience system and correlate to that week's material. If you miss the due date you will receive a zero for that assignment.

Co-curricular activities

An integral part of this course is to make connections between the science of the environment and sustainable human societies. In addition to class activities and examinations, I ask you to explore this outside of the classroom through co-curricular activities. This includes regional events linked to environmental issues, meetings with local environmental leaders, and a possible environmental movie series. To earn full credit for the course participation segment of your assessment you must participate in at least two co-curricular events during the semester related to science and the environment. You are required to attend **at least two** co-curricular activities during the term to receive full credit for the class participation grade. (You are welcome to participate in more if

you like, but that's optional and *will not affect your course grade*.). I have provided a partial list of options below. I will announce additional activities on BlackBoard.

- Attend an event at the Swale Project, a floating food forest, in NYC. http://www.swaleny.org/
- Any of the varied Public events hosted by Yale School of Forestry and Environmental Studies. A list of events is available at http://environment.yale.edu/calendar/month
- Attend a hike with the Outdoors Club. Find them on OrgSync
- Attend a meeting of the Campus Sustainability Committee. Usually second Wednesdays each month at 1 PM in the BCC
- Participate in a citizen science activity to monitor local environmental quality. **Service for Justice (S4J) Residential College students must choose at least one of these.** Other interested students should meet with Prof. Biardi to discuss this option. Projects include:
    - *Monitoring physical and chemical quality of the local watershed.* (Service learning option) You will learn to use the field methods and equipment environmental professionals employ to monitor water quality, then collect data on local watershed to assist management decisions by the University or other groups.
    - *Monitoring regional biodiversity.* (Service learning option) You will learn to use the field methods and equipment environmental professionals employ to monitor benthic macroinvertebrate communities of local watersheds. This data is submitted to the State of Connecticut for reporting requirements to the EPA under the Federal Clean Water Act.
    - *Sustainability on the Fairfield University campus.* You will evaluate one section of the draft Fairfield University Campus Sustainability Plan (such as Energy, Waste Management, Transportation, Student Engagement, …) based on the science underlying that issue.

I will notify you of additional events as they are scheduled. In addition, if you hear of an event that you think might qualify for course credit, let me know!

FAQs

- **Attendance is required** for acceptable understanding of the course material, as well as fruitful participation in class activities and discussions.
- **Pre-arranged**, documented, and valid absences from exams will be granted on an individual basis. Makeup may consist of an oral examination arranged outside of normal class time. There is **no makeup** for missed class participation and activities. You will be on time, or you will not receive credit.
- **Policy on personal electronic devices:** Our class sessions are meant to provide a space and time to focus attentively, in collaboration, on the course material. Listening to and working with each other is imperative and requires focused concentration. "Multitasking" inhibits learning, disrupts communication, and is distracting to your peers. Thus, while you are permitted to bring personal devices (cell phones, tablets, laptops, sound recorders, and other electronic devices) to class, they **must only serve class needs** (e.g., typing on a laptop for an in-class writing assignment; using an iPhone to record lectures). If you ever appear to be "backgrounding" the class you will be considered absent for the day, and may be asked to leave class. *Examples of "backgrounding" the class include: answering/making a call; texting/IMing; e-mail; web surfing; wearing headphones; Instagram, Snapchat, or other social network; reading/studying material not related to class content (e.g. a magazine); and handheld gaming.*

Academic and Disability Support Services: The University provides a wide range of services designed to assist students in meeting the academic challenges that college presents. The four principal services offered are: academic skills assistance, peer tutoring, assistance for students with disabilities, and support and advisement for international students. If you have a documented disability and wish to discuss academic accommodations, please contact the Office of Academic and Career Development Services in the Kelley Center.

Academic Honesty:
Fairfield University's primary purpose is the pursuit of academic excellence. Teaching and learning must be based on mutual trust and respect. This is possible only in an atmosphere where discovery and communication of knowledge are marked by scrupulous, unqualified honesty and integrity. Such integrity is fundamental to, and an inherent part of, a Jesuit education. Any violation of academic integrity wounds the entire community and undermines the trust upon which the discovery and communication of knowledge depends.

Therefore, violations of academic integrity will not be tolerated in this course. Please see your Student Handbook for University policies on this issue.

Class Schedule

Week of	Topic	Readings
9/3	• Sustainability: Science, Economics, and Policy • Systems Theory and Environmental Issues	Chs. 1, 5, Ch. 2: 21–26
9/10	• Chemistry, Energy, and Ecosystems • Evolution, Ecology, and Population Growth	Ch. 2: 27–45 Ch. 3
9/17	• Species interactions, Communities, and Biomes • SimBio virtual lab: *Isle Royale*	Ch. 4 Handout on Bb
9/24	• ***Midterm 1*** • NOVA *World in the Balance: The Population Paradox*	Exam: Chs. 1–5 + lab Video and discussion
10/1	• Human Population Growth and the I=PAT paradigm • Feeding the Human Population: Soil, Agriculture, and GMOs	Ch. 6 Ch. 7
10/8	• Tu: no class session (*Indigenous People's/Columbus Day*) • Water is Life; SimBio virtual lab: *Sewage*	 Ch 12; Handout on Bb
10/15	• ***Midterm 2*** • Land Use, Resource Management, and Mining	Exam: Chs. 6, 7, 12 + lab Chs. 9, 11
10/22	• Biodiversity and Conservation • Guest lecture: *Project Wallacea*	Ch. 8
10/29	• NOVA *World in the Balance: China Revs Up* • Atmospheric Science and global atmospheric challenges	Video and discussion Ch. 13 and readings on Bb
11/5	• ***Midterm 3*** • Energy: Fossil Fuels and Renewables	Exam: Chs. 8, 9, 11, 13 Chs. 15, 16, worksheet
11/12	• Working with Data on Global Climate Change	Ch. 14: 302–311 Data and handout on Bb
11/19	• Impacts of Global Climate Change • F: no class session (*Immigrant Feast Day/Thanksgiving*)	Ch. 14: 312–322, readings on Bb
11/26	• Solutions to Global Climate Change • Climate Stabilization as an initial goal	Ch. 14: 322–330, CMI materials on Bb
12/3	• Environmental Toxins and Hazards • Municipal Solid Waste and Hazardous Waste	Chs. 10, 17
12/16 Sunday	***Review session*** (Optional) 10 AM, location TBD	
12/18 Tuesday	***Final Exam*** 8:00 AM	Exam: ½ Chs. 10, 13–17 and ½ cumulative