



*Preparing people to lead extraordinary lives*

**UCSF 137**  
**The Scientific Bases of Environmental Issues**  
**Rome, Fall 2019**

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**Texts:** Christensen, *The Environment and You* (2<sup>nd</sup> edition); Oppenheimer et al., *Discerning Experts*.

**Class Meetings:** Monday, 9:30 a.m.–12:30 p.m.

**Office Hours:** Monday, 12.30pm-1.30pm

**Core Area Satisfied:**

This is a foundational scientific course as part of the Core Curriculum at Loyola University of Chicago.

**Course Description:**

Many of the most important policy and societal decisions of the 21<sup>st</sup> century will be driven by environmental issues. These include planetary, systemic, complex problems the ramifications of which we are only just beginning to understand. Climate change, biodiversity loss, pollution, and the challenge of providing sufficient resources to an ever increasing and increasingly more consumptive population stand out as particularly urgent matters. This course provides the scientific background needed to understand these issues, and discusses the complexities of the science/policy interface. The objective is to enable students to meaningfully participate in some central policy discussions of the next several decades.

### **Course Objectives:**

By the end of the semester, the students should be able to:

- exhibit knowledge of the main environmental issues of our times;
- recognize the interconnections among the different scientific disciplines and how their principles are used in investigating environmental issues;
- demonstrate understanding of basic physical and chemical principles underlying environmental science;
- exhibit knowledge of the philosophical complexities of scientific explanation;
- explain the difficulties inherent in the science-policy interface in modern societies;
- understand tensions between expertise, democratic political authority, and some forms of expertise denialism;
- understand and describe important cycles in nature

### **Specific Goals:**

1. Gaining factual knowledge (terminology, classifications, methods, trends) about the environment, how it has been changed, and where we are heading.
2. Learning fundamental principles, generalizations, and theories.
3. Gaining a broader understanding and appreciation of intellectual/cultural activity, primarily science.

### **Readings:**

1. Christensen 2013. *The Environment & You*. Pearson.
2. Oppenheimer, Jamieson, Oreskes et al. 2019. *Discerning Experts. The Practice of Scientific Assessment for Environmental Policy*. University of Chicago Press.
3. Rosemberg 2011. *Philosophy of Science*. Routledge.

We shall read substantial parts of each of these books. Relevant parts of Christensen's and Rosemberg's will be distributed by the instructor. **Students are required to purchase *Discerning Experts*.**

### **Other Resources:**

#### 4. *Sakai* connection

Additional course materials will be also provided via the Sakai learning management system, which can be accessed at: <https://sakai.luc.edu/>

It is expected that students will access and submit assignments and other coursework via the Sakai system using their Loyola ID and password.

[http://www.luc.edu/itrs/sakai/whatis\\_sakai/](http://www.luc.edu/itrs/sakai/whatis_sakai/)

<http://www.luc.edu/itrs/sakai/sakai-student-tutorials.shtml>

**Preparation:**

Weekly readings should be done prior to weekly meetings. The reading material might not be covered in its entirety during class time, but it is still considered part of your work and may appear on the exams.

**Course Evaluation:**

20% midterm exam

25% class participation

25% group presentations

30% final exam

*Mid-Term Exam (20%):*

The exam will include questions on the material studied in the first half of the course.

*Class participation (25%):*

Students must be present during class sessions in order to receive credits, as we will hold frequent discussions in the class. For these discussions, students will need to have done the reading ahead of time for class and be prepared. Your grade for this portion of the course will be based on the cogency of your comments (and questions), and the respect for all opinions that you exhibit as we will discuss some controversial issues.

*Group presentations (25%):*

Students will divide into groups of 2-5. Each group will prepare a presentation covering different topics of the course. Recent articles should be used to communicate the current status of the issue and include any controversies. Presentations should be around 20 minutes long and the presenting group should then lead and facilitate the class discussion.

*Final Exam (30%):*

Students will have 2 hours to complete the exam. The final will include all material read and discussed throughout the term.

**Attendance Policy**

In accordance with the JFRC mission to promote a higher level of academic rigor, all courses adhere to the following absence policy:

- For all classes meeting once a week, students cannot incur more than one unexcused absence.
- For all classes meeting twice a week, students cannot incur more than two unexcused absences.
- For all classes meeting three times a week, students cannot incur more than two unexcused absences.

This course meets once a week, thus a total of one (1) unexcused absence will be permitted. **Unexcused absences beyond this will result in 1% lowering of your final course grade, for every absence after the “approved limit”.**

**Grading:**

Final letter grades will be calculated as follow, based on the cumulative percentage from the tasks described above:

A: 94-100    A-: 90-93  
B+: 87-89    B: 84-86    B-: 80-83  
C+: 77-79    C: 74-76    C-: 70-73  
D+: 67-69    D: 60-66    F: <60

### **Course Outline:**

1. September 2 : **Introduction to the course (Christensen pp. 1-60)**
2. September 9 : **The scientific method (Rosenberg pp. 13-68)**
3. September 16 : **Water (Christensen pp. 332-376)**
4. September 23 : **Biodiversity (Christensen pp. 234-331)**
5. September 30 : **Climate (Christensen pp. 196-232)**
6. October 7 : **Midterm Test**

#### **October 14 Fall Break**

7. October 21 : **Why We Disagree On Climate Change (excerpts from D. Jamieson, *Reason in a Dark Time* 2014)**
8. October 28 : **Agriculture and Food (excerpts from L. Brown, *Full Planet, Empty Plates* 2011)**
9. November 4 : **Energy (Christensen, pp. 450-515)**
10. November 11 : **Urban Ecology (Christensen, pp. 516-579)**
11. November 15 : **Scientific expertise and the environment (Oppenheimer et al. ch. 1 and 4)**
12. November 18 : **The Science/Policy Interface (Oppenheimer et al. ch. 5 and 6)**

#### **November 25 Thanksgiving Recess**

13. December 2 : **Review**
14. December 7-12 (TBA) - **FINAL EXAM**

### **Academic Honesty:**

Clear explanations of academic integrity at Loyola University of Chicago are provided

at: <http://www.luc.edu/education/resources/academic-policies/academic-integrity/>

These policies will be enforced in this course and breaking them will automatically lead to zero points for the assessment task in question. I reserve the right to impose more severe penalties, including a grade of 'F' for the entire course. All breaches of the policy will be reported to your Dean's office. For additional academic policies and procedures refer to:

[http://www.luc.edu/education/academics\\_policies\\_main.shtml](http://www.luc.edu/education/academics_policies_main.shtml)

### **Accessibility:**

Students who have disabilities that entitle them to accommodations under the Americans with Disabilities Act should register with the Services for Students with Disabilities (SSWD) office. To request accommodations, students must schedule an appointment with an SSWD coordinator. Students should contact SSWD at least four weeks before their first semester or term at Loyola. Returning students should schedule an appointment within the first two weeks of the semester or term. The University policy on accommodations and participation in courses is available at: <http://www.luc.edu/sswd/>