IB 105 Environmental Biology: Course Description
Instructor: Julian Catchen (jcatchen@illinois.edu), 233 Morrill Hall

This class is an introduction to the biology of environmental problems. Environmental problems are immensely complex, involving aspects of history, philosophy, behavior, science, economics, social justice, and politics. This course is designed to engage you with a broad perspective on our relationship with land, water, air, and other living things, in order for you to become an ecologically literate citizen. Ecological literacy involves a basic understanding of how the world works, and the ability to see and understand the connections between living and nonliving things. On an individual level, ecological literacy also requires an ability to see the connections among personal behavior, personal health, and the health of natural systems. Ecological literacy requires a comprehension of environmental problems and the ability to distinguish between sustainable and unsustainable uses of nature. Finally – and perhaps most importantly – ecological literacy involves the ability to identify and generate solutions to environmental problems, and to help enact those solutions. We expect you to engage yourself with the essential background information and knowledge necessary to facilitate your own path to ecological literacy.

This course satisfies the General Education Criteria for a Life Sciences course. In addressing the broad scope of environmental biology, we will also cover all the fundamental concepts of the life sciences, including genetics, speciation, evolution, growth and differentiation, metabolism and bio-energetics, ecology, and behavior. We will review scientific methodology, and you will engage in exercises that involve making observations, evaluating data, and problem solving.

Course Goals and Objectives

Upon completing this course, students will be able to:

• Describe how humans - as animals - need nature to survive.
• Compare and contrast ways in which people have distinguished between the use and abuse of nature.
• Summarize ways in which sustainability has been defined.
• List environmental problems that are the result of unsustainable human behavior, and explain the root causes of environmental problems.
• Explain core concepts in ecology, and summarize our ecological understanding of environmental problems.
• Explain how human health is related to land health.
• Summarize changes in design/architecture, economics, policy, and education that promote sustainability.
• Articulate his/her environmental ethic, and list actions to reduce his/her ecological footprint.

Course Structure

This is a 3–credit hour course. The course is 8 weeks long and consists of 7 content modules. Please be aware that this course is accelerated in nature; 16 weeks’ worth of
content will be covered in a 8-week time span. You should dedicate approximately **12–16 hours** per week to working on the course itself, but actual time commitments will vary depending on your input, needs, and personal study habits. You are required to log on to the course website a minimum of **4 days per week** but as discussions develop, you will probably need to do so more frequently.

This course is designed with the principles of collaborative learning and active participation in mind. You are encouraged to share your thoughts and engage in problem-solving. The course has a consistent and predictable structure, organized around the weekly modules, with a course website that is straightforward and easy to navigate. Instructions and due dates for activities and assignments are clearly articulated so that you know what is expected of you and to stay on track.

We realize that you have a life beyond the scope of this course. However, if you are unable to complete an assignment because of professional obligations, you should notify the instructor or, better yet, prepare the assignment ahead of time and post it early. This will give your classmates a head start in reading and responding to your work. Most assignments are due by noon of their respective due dates as listed on the course calendar, giving you and your classmates time to read and comment on each other’s work before the next module begins.

Readings and responses to discussion questions should be read and submitted during the module for which they are assigned in order to get the most benefit from the discussions. At the end of each content module, participants will have an opportunity to make sure that they have completed all the required activities and assignments.

**Textbook:**


**Course Outline**

**Week 1: Introduction**

This week’s module serves as an introduction to environmental biology, a review of the scientific method, and an orientation to the structure and pace of the course.

- Lecture: Introduction to the Course
- Lecture: Introduction to Environmental Science
- Lecture: Sustainability
- Discussion Activity: The Environment and You
- Date choices for future course activities
- Self-Assessment #1
Week 2: Ecology and Evolution

Human interaction with the planet's ecosystems are a fundamental part of environmental biology. This week, you will learn how natural systems are organized and function starting at the population level (the unit at which evolution occurs). You will learn more about what science is, and how it is practiced. You will also review the basics of evolution.

- Lecture: Population Ecology
- Lecture: Community Relationships and Evolution
- Lecture: Biomes and Terrestrial Ecosystems
- Activity: How Science Works
- Activity: The Fundamentals of Evolution
- Discussion Activity: Current Environmental Issues (Week 2 students)
- Self-Assessment #2

Week 3: Protecting Biodiversity

This week we will discuss various forms of biodiversity from the diversity of ecosystems on the planet to the genetic diversity held in wild populations and our crop plants. A major impact on biodiversity is the introduction of invasive species.

- Lecture: Investigating Biodiversity
- Lecture: Invasive Species and Pest Control
- Lecture: Genetic Engineering of Crops
- Discussion Activity: Environmental Ethics
- Discussion Activity: Current Environmental Issues (Week 3 students)
- Self-Assessment #3

Weeks 4: Human Populations

We will discuss the growth of human populations in various countries, methods of building sustainable communities, and the agricultural methods have have sustained a growing population.

- Lecture: Human Population Dynamics
- Lecture: Sustainable Communities
- Lecture: Agriculture and the Environment
- Discussion Activity: Human Population Growth Essay
- Discussion Activity: Current Environmental Issues (Week 4 students)
- Self-Assessment #4

Week 5: Environmental Changes

This week we will discuss some of the major changes we have made in the environment through our use of natural resources.

- Lecture: Global Climate Change
- Lecture: Water Use and Pollution
- Lecture: Waste and Recycling
- Discussion Activity: Uncertainty and Climate Science
• Discussion Activity: Current Environmental Issues (Week 5 students)
• Self-Assessment #5

Week 6: Energy Sources

Everything in life uses energy -- movement, reproduction, transportation, growth, processing. In fact, the rapid industrialization of modern times that has resulted in high standards of living are the direct benefit of inexpensive energy, the burning of fossil fuels. Fossil fuel combustion has also led to the most important environmental challenge of our time, global climate change. The continued growth of our economy depends on finding sources of energy that do not harm the environment.

• Lecture: Non-renewable Energy Sources
• Lecture: Biofuels
• Lecture: Other Renewable Energy Sources
• Discussion Activity: The Challenge Before Us
• Discussion Activity: Current Environmental Issues (Week 6 students)
• Self-Assessment #6

Week 7: Environmental Policies

Congress can pass legislation to control pollution, the President can establish national parks for conservation, federal and state agencies monitor actions and apply pressure or give encouragement for change, and grassroot organizations can affect change on a local level. However, the change you have the most control over is your personal behavior. Everything you do affects the environment; make that a positive effect.

• Lecture: Human Impacts
• Lecture: Environmental Policies
• Final Project: Climate Change Reality and Myths
• Self-Assessment #6

Grading Policy & Activity Outline

Grading Scale

View the College of LAS Handbook for Students Grades & Reports page for more information.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percent</th>
<th>Grade</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>97-100</td>
<td>C</td>
<td>73-76</td>
</tr>
<tr>
<td>A</td>
<td>93-96</td>
<td>C-</td>
<td>70-72</td>
</tr>
<tr>
<td>A-</td>
<td>90-92</td>
<td>D+</td>
<td>67-69</td>
</tr>
<tr>
<td>B+</td>
<td>87-89</td>
<td>D</td>
<td>63-66</td>
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<tr>
<td>B</td>
<td>83-86</td>
<td>D-</td>
<td>60-62</td>
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<tr>
<td>B-</td>
<td>80-82</td>
<td>F</td>
<td>0-59</td>
</tr>
<tr>
<td>C+</td>
<td>77-79</td>
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Assignments, Weights, and Deliverables
<table>
<thead>
<tr>
<th>Grade Components</th>
<th>% of Course Grade and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td>2%</td>
</tr>
<tr>
<td>Lectures</td>
<td>20%</td>
</tr>
<tr>
<td>Individual Assignments</td>
<td>20% Individual assignments including essay posts and replies.</td>
</tr>
<tr>
<td>Environmental Issues Presentation</td>
<td>9.5% Includes one presentation and replies each week to your classmates’ presentations. The lowest reply score is dropped.</td>
</tr>
<tr>
<td>Climate Change Final Project</td>
<td>10%</td>
</tr>
<tr>
<td>Self-Assessments</td>
<td>18% The lowest exam is dropped.</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20.5%</td>
</tr>
<tr>
<td>Extra Credit</td>
<td>Up to 2% By participation in the Q &amp; A forums</td>
</tr>
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**Week Overview**

Each week will begin with the overview, explain what the week is about, what learning goals you are expected to achieve, how long it will take, and in what activities you will participate. Each week is designed with the same structure and activities unless otherwise specified.

**Individual Assignments**

The course includes three lecture lessons in most weeks where the instructor covers the bulk of the content. This, together with any assigned readings, should give you exposure to all of the information you need to know.

**Interactions**

A variety of discussion assignments will help students to interact with the instructor and other students in order to reach a deeper understanding of the topics. These assignments typically start with each student researching a topic and posting a report on what was found to the forum. Students are then required to read and respond to their classmates’ posts and replies.

**The Current Environmental Issues Presentation**

All students will choose a current environmental issue, research it, and create a presentation describing it. Students will choose a week to present and each week during the course those students will post their presentations, while their classmates will discuss the presentation in the forum.

**Climate Change Reality and Myths Final Project**

A large number of climate change myths have taken the guise of scientific inquiry, but are often the result of the misrepresentation or misinterpretation of existing evidence. For the final project, each student is tasked with evaluating one climate change myths
against the existing climate science. To do this, students will research an original scientific publication and create a presentation describing the research and post it to the forum. Their classmates will discuss and comment on the presentation.

**Self-Assessments and Final Exam**

Each week students will take a self-assessment to evaluate new knowledge obtained. The exams will be primarily multiple choice, but may also include matching and will cover the objectives for each lecture and discussion lesson. There will be a comprehensive final exam during the final exam period.

**Academic Integrity**

Expectations

Academic dishonesty will not be tolerated. Examples of academic dishonesty include the following: cheating, fabrication, facilitating infractions of academic integrity, plagiarism, bribes, favors, and threats, academic interference, examination by proxy, grade tampering, and non-original works.

Academic integrity means being honest about your intellectual work. In the context of our course, this means that you assert that written work you submit for the course is a product of your own intellectual effort and not the work of someone else. The written materials you prepare for this class are a method of demonstrating your knowledge of the facts and your understanding of the concepts of environmental biology. If you use the words and ideas of another as your own, you are not being honest and have only demonstrated the other person's knowledge and understanding, not your own.

Discussion activities, including the "Environmental Issue Project", will occasionally require you to research a topic using other sources. It is acceptable to use information and data from internet or printed sources as long as the source is clearly cited. However, under no circumstance is it acceptable to directly copy written information from a source (website or printed). Even if the source is acknowledged, directly copying written information is considered plagiarism.

**Self-assessments** must be taken without the aid of text book, internet or other student help. Self-assessments are an individual effort.

**Copying and Propagation of Course Materials**

It is expressly forbidden to make copies of course materials without permission, including, but not limited to, self-assessments, exams, and assignments. It is further forbidden to upload any course materials to online websites including, but not limited to, course-assistant sites (e.g. CourseHero), online shared documents (e.g. Google Docs), or other online forums (e.g. Reddit). If you upload course material to these sites, we will consider that academic dishonesty of the most severe degree and will seek the maximum penalty via the University adjudication process.

**Guidelines**

Should an incident arise in which a student is thought to have violated academic integrity, the student will be processed under the disciplinary policy set forth in the Illinois Academic Integrity Policy. All alleged incidences of academic dishonesty will be adjudicated using the University FAIR system.
If you do not understand relevant definitions of academic infractions, contact the instructor for an explanation within the first week of class.

**Student Accommodations**

To ensure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class are asked to contact the instructor as soon as possible.