

BIOLOGY 450W: FIELD ECOLOGY

Biology 450: It's not just a class, it's an adventure. If you like tromping through the forest, looking under rocks, musing about the "whys" of our existence, exploring personal power, reading great nature articles and figuring out the answers to interesting ecological questions, this course is for you.

Instructor: Dr. Christopher Uhl; 322 Mueller Lab; cfu1@psu.edu

Teaching Assistant: _____

Office Hours: C. Uhl: by appointment—just email to set up a time

Text: All course readings will be provided in a packet available at Webster's Book Store on South Allen (across from Appalachian Outdoors)

Philosophy: Biology 450 is likely to be different from most classes you have taken at Penn State. I invite you to "engage" with all aspects of Ecology—human, plant, animal, social—through reflection, analysis, and action. Because I believe that people learn best when they are free to take an active role in the learning process, I have done everything I can think of to invite your full participation--camping trips, field studies, ecological meals, story telling. Please know at the outset that this is not a course for the faint hearted. You will be invited take risks and to grow in new and unexpected ways.

After all is said and done, my goal is no less than this: *That each of us might think thoughts that we have never had the knowledge to think; that we might write what we have never had the wisdom to write; that we might say what we have never had the courage to say; and that we might feel what we have never had the awareness to feel... and, in so doing, that each of us might come to experience ever-more fully what it means to be a human being.*

Here is what you can **expect** from me:

- 1) We will be prepared for class.
- 2) We will do our best to give you honest and constructive feedback on your work.
- 3) We will be available to meet with you whenever the need arises.
- 4) We will challenge your assumptions while being enthusiastically open to your ideas and questions.
- 5) We will present you with a challenging and broad view of ecology.

Here is what I **request** from you:

- 1) We request that you attend all class meetings and that you be punctual.
- 2) We request that you come to class with an open mind, well prepared and ready to participate.
- 3) We request that you contribute to an atmosphere of mutual respect and caring.

4) We request that you be willing to stretch, take risks, and unleash your natural curiosity.

Class Structure: Our meeting place/time on Tuesdays is 1:00-2:15 pm in 317 Mueller and on Thursdays from 1:25 to 5:30 pm in 317 Mueller. Most Tuesdays we will be discussing readings and/or preparing for our Thursday field activities. Most Thursdays we will spend in the field. We will also have two weekend field trips on September 14-16 and October 20-21.

I. THE COURSE: Week by Week

PART 1. THE PRACTICE OF OBSERVATION

WEEK 1. INTRODUCTION

Readings:

- | | |
|----------------------------|-----------|
| --What's an Education for? | D. Orr |
| --Stump Sitting | L. Fergus |
| --Observation Practices | C. Uhl |

Class Meetings:

- 8/28—Introduction
- 8/30—Field trip to Sunset Park

Assignments: 1) Make your course Journal (See guidelines, pg. 6 of this syllabus) and make your **first** journal entry describing the journal making process (this entry goes in Section I of your journal); 2) produce a 2-3 page reflection on Thursday's class and place this in Section I of your Journal; 3) Offer reflections on EACH of this week's 3 readings and place these in Section II of your journal; and 4) Visit WALNUT SPRINGS PARK with your partner between now and next Tuesday and locate your assigned plant. Spend an hour making observations of this plant. Then one member of your pairing arrange to spend a couple hours seeing what you can learn about this plant using the internet. As for the other member, go to the library and see what you can learn about this plant by searching various ecological data bases. Make a copy of at least two journal articles that interest you which involve studies of your assigned plant.

Note: Section I of your journal is for your class notes and reflections; Section II is for your notes and reflections on the course readings; and Section III is for all your notes and observations relating to your Natural History Project.

WEEK 2. FROM OBSERVATION TO QUESTIONS

Readings:

- | | |
|---------------------------------------------------------------------|-------------|
| --Damsel flies, aphids, acorn weevils, bark beetles (not in packet) | D. Stokes |
| --The Energetics of the Bumblebee | B. Heinrich |
| --Tree Tactics | J. Schultz |
| --Turning Inside Out | D. Abrams |

Class Meetings:

- 9/4—The Library
- 9/6—Discuss Readings; Field trip to Walnut Springs Park

Assignments: 1) Place a 1-3 page reflection on Thursday's class in Section 1 of your Journal; 2) Offer reflections on Readings 1→4 in your journal (Section II).

WEEK 3. A WEEKEND IN THE FOREST

Readings:

- | | |
|---------------------------------------------------|----------------------------|
| 1--A Windstorm in the Forest | J. Muir |
| 2--A Study in Stumps | T. Wessels |
| 3--Why Slugs Squabble ? | C. Rollo and W. Wellington |
| 4--The New Story of Creation | C. Raymo |
| 5--Seeing Ourselves as Part of Earth's Metabolism | C. Uhl |

Class Meetings:

- 9/11—Discuss readings 1, 2 & 3
- 9/13—Prepare for Greenwood Furnace Trip (1.5 hour class today)
- 9/14-9/16—Greenwood Furnace State Park camping trip. Leave Friday at 4:30 PM; return on Sunday, 3:30 PM

Assignments: 1) Produce a 2-3 page reflection (typed and single-spaced) on the weekend camping trip and place this in Section 1 of your journal. In this reflection **INCLUDE** reflections on this week's 5 readings, as appropriate; 2) Begin analysis and write-up for mountain vegetation survey (due 10/2).

WEEK 4. A WALK UP SPRING CREEK

Readings:

- | | |
|----------------------------------------------------------|-------------|
| --The Power of Questions | C. Uhl |
| --Living Water | D. Quammen |
| --A Walk up Hidden Creek | J. Harte |
| --Assessment of Biotic Integrity Using Fish Communities. | J. R. Karr. |

Class Meetings:

- 9/18-- Discuss readings—especially the Harte reading; review equipment
- 9/20--Spring Creek: Aquatic ecology field methods

Assignments: 1) Offer a reflection on our Thursday field trip in Section I of journal; 2) Offer reflections

on each of this week's 4 readings in Section II of your journal; 3) **Begin** your Natural History Project Report. This report should include: 1) description of study system, 2) summary of key observations to date, 3) data collected to date organized in tables and 4) your research plan, **including a description of field methods to be used**. This report (3-4 typed, double spaced) should be placed in Section III of your journal; report due 10/2.

WEEK 5. FROM FIELD OBSERVATIONS→QUESTIONS→ EXPERIMENTS

Readings:

--The Way a Mind Wended	C. Fergus
--Special Delivery	R. Finch
--What are the Squirrels Hiding?	M. Steele & P. Smallwood
--When Leaves Save the Tree	S. Vogel

Class Meetings

9/25--Creativity exercise; Discussion of readings

9/27—TBA

Assignments: 1) Write summary of Thursday's NHP-related work in Section III of Journal; 2) Offer a reflection on this week's readings in Section II of Journal.

Note: Your Journal will be collected on Tuesday, October 2; be sure it is up-to-date.

Note: Interim Report on Natural History Project also due on 10/2 should be typed and placed in Section III of your journal.

PART 2. ASKING QUESTIONS IN THE FIELD

WEEK 6: ECOLOGICAL ENERGETICS

Readings:

-People and Nature	C. Glendinning
-Comparing the Energetics of....	D. Aubert (sample NHP)
-Reading 1 Related to your NHP_____	
-Reading 2 Related to your NHP_____	

Class Meetings:

10/2--TBA

10/4—Ecological Energetics Field Problem

Assignment: 1) Offer a reflection on our Thursday field trip in Section I of your Journal; 2) Offer a reflection on this week's readings in Section II of Journal; 3) Begin, if you haven't already, the experimental phase of your NHP.

*Note: Both Journals and NHP Interim Report will be collected today.

WEEK 7. QUESTIONS IN THE FIELD: SEED ECOLOGY AND DATA ANALYSIS

Readings:

- Colonizing Abilities of Biennials K. Gross & P. Werner
- Fruit for all Seasons E. W. Stiles
- Earthworms and Seeds M. McRill and G. R. Sagar

Class Meetings:

- 10/9--**Dissecting** a journal article—(critical reading of Gross and Werner)
- 10/11--Seed ecology investigation: Analyzing data using statistics

Assignments: 1) Offer a reflection on our Thursday field exercise in Section I of your Journal; 2) offer a reflection on this week's readings in your journal, Section II; 3) Analyze data from Seed Ecology experiments and prepare lab write-up (Section I, journal; due 10/23).

WEEK 8. LARGE SCALE FIELD EXPERIMENTS: "MANAGING" PA FORESTS

Readings:

- Selections from The Trees in my Forest B. Heinrich
- Whitetails are Changing our Woodlands S. B. Jones et al.
- Major New Tree Disease Epidemics: Beech Bark Disease D. R. Houston
- Beech J. Maloof
- Making Other Arrangements J. H. Kunstler

Class Meetings:

- 10/16— Analyzing data: Seed dispersal experiments
- 10/20-10/21--Overnight field trip to Allegheny Plateau; Leave Saturday at 4:00; return home 10 PM Sunday.

Assignments: 1) Produce a 2-3-page (typed and single-spaced) report on your observations, questions, and insights emerging from the Allegheny trip (Section I of your journal); 2) Offer reflections on this week's four readings in Section II of Journal.

WEEK 9: NATURAL HISTORY PROJECT CONSULTATIONS

Readings:

- How to write a scientific paper
- Plea to a symposium goer D. Janzen

Class Meetings:

- 10/23—Discussion of Natural History Projects
- 10/25—Field visits by Uhl and Vandegrift to selected NHP sites

Assignment: Write Natural History Project paper and prepare your seminar (due 11/1)

WEEK 10. NATURAL HISTORY FINALE

Readings:

You choose: Related to your natural history project

Class Meetings:

10/30--open

11/1--Mini-symposium: Presentations of Natural History Projects

Assignment: 1) Prepare Natural History Project presentation for class symposium.

Note: *Natural History Project paper should be handed in on Thursday, November 1st. Up-to-date journals (including Seed and Allegheny Reports) will be collected on November 1st, also.*

PART 3. SUSTAINABILITY: ECOLOGY'S BIGGEST CHALLENGE

WEEK 11. THE ECOLOGICAL FOOTPRINT

Readings:

--Earth + 30 as Seen by the Earth

D. Meadows

--Deciphering the Causes of Earth Breakdown

C. Uhl

--Footprinting (3 chapters)

J. Merkel

Class Meetings

11/6— Film: *The End of Suburbia*

11/8—Field Trip to Center for Sustainability.

Assignments: 1) Offer a reflection on our Thursday field trip in Section I of your Journal; 2) Offer a reflection of this week's 3 readings Section II of your journal; 2) Calculate your personal ecological footprint and present your findings in a 3-4 page typed (single-spaced) report to be placed in Section I of your journal (due 11/29).

WEEK 12: SUSTAINABLE FOOD SYSTEMS: FARMING AND ECOLOGY

Readings:

--Eating in the Bioregion

D. Blair

--Hamburger and a Coke

Ryan & Durning

--The Food Gap

M. Winne

--Food Miles

J. Walljasper

--Dumpster Diving

P. Singer and J. Mason

--Planetary Pulse

D. Matesz

Class Meeting:

11/13—Discuss readings in context of Ecological Footprint

11/15—Field trip to Tait Farm

Assignments: 1) Produce a reflection on this week's field trip to Tait Farm and place in Section I of

Journal; 2) Reflections on readings in Section II of your journal.

WEEK 13: THANKSGIVING (NO CLASS)

WEEK 14: ECOLOGICAL SUSTAINABILITY

Readings:

- Story: Creating Meaning in a Time of Crisis C. Uhl
- PSU Indicators Report Green Destiny Council
- Strategic Questioning F. Peavy

Class Meetings:

- 11/27—Film and Discuss readings
- 11/29—Strategic Questioning Field Exercise

Assignment: 1) Make a journal entry in Section 1 offering your reflections on the S.Q. exercise; 2) Make a reflections on this week's readings in Section II of your journal.

Note: Eco-Footprinting Project due 11/29.

WEEK 15: DESIGNING A SUSTAINABLE WORLD: ECOLOGY AND AGENCY

- Home From Nowhere J. H. Kunstler
- Area Affected by U.S. Road System R. T. Forman
- Just Walk Out! K. Algaard

Class Meetings:

- 12/4—Plan Ecological Education Event
- 12/6—Ecological Agency Event

Assignments: 1) Produce a reflection in Section 1 on this week's activity; 2) offer a reflection on the readings in Section II of journal.

WEEK 16: EXPLORING THE ECOLOGY OF THE HUMAN MIND

Readings:

- Transforming Self—Transforming Society C. Uhl
- The Idols of Environmentalism C. White
- The Ecology of Work C. White
- The World is in You D. Chopra

Class Meetings:

- 12/11: Film
- 12/13: Final Meeting/Ecological Meal to be held at Friends Meeting House (611 E. Prospect—just one block up from University Drive on Prospect)

Assignments: 1) Offer a reflection on this week's two readings in your journal, Section I; 2) Produce Final Course Essay--due, Tuesday, December 18th.

Note: Ecological Identity Projects are due on 12/13.

II. ASSESSMENT

A grade in my view should be a symbol of your level of **engagement** with the subject. If you have worked hard to understand, think about, and interact with the subject matter of a course, you deserve a good grade. If, on the other hand, you have expended little effort on a course, your grade should reflect this.

So it is that "engagement" will be the focal point for assigning your grade in Bio 450. With this in mind, your course grade will be based on the following:

i. Course Journal (30 points)	-
-Journal construction/design & accompanying essay	6 points
-Journal Content (e.g., reflections on field exercises and readings (Sections I & II)	24 points
ii. Special write-ups (25 points)	
-Mountain survey	5 points
-Seed analysis	5 points
-Allegheny trip summary	5 points
-Eco-footprint analysis	10 points
iii. Natural History Project (30 points)	
-Interim report	5 points
-Final paper	20 points
-Oral presentation	5 points
iv. Ecological Identity Project	5 points
v. Synthesis essay	10 points
	<hr/>
	100 pts.

Letter grades will be assigned as follows: A: 94-100 points; A-: 90-93.9 points; B+: 87-89.9; B: 83-86.9; B-: 80-82.9; C+: 76-79.9; C: 70-75.9; D: 60-69.9; F: below 59.9.

i. **Course Journal (30 points)**

Journal construction and design (6 points): The instructions for creating a journal are simple:

Use only non-virgin materials

- A non-virgin material is one that is not new or being used for the first time. Some examples of non-virgin materials are: sheet of paper with clean side from the recycling bins of campus, string and ribbon from existing decorations, and cardboard from discarded boxes.

Tell a story

- Construct your journal in such a way that it tells a story" about you before anything is written in it. As much as you can, with the non-virgin materials you find, make it a reflection of who you are (likes, personality, hopes, etc.) Spend time with this creation process.

Design for Accessibility and Durability

- In designing and constructing your journal, keep in mind that you will need to be able to remove and replace assignments and entries easily.
- This journal is going to travel with you throughout the semester. Be sure it can handle a good bit of use without falling apart.

Journal Content (24 points)

Once you have completed your journal and written an account of this process, divide your journal into three distinct parts as follows:

- 1-Class Notes and field trip Reflections (explained below)
- 2- Notes and Reflections from course readings (explained below)
- 3-Natural History Project observations, field sketches, and raw data (explained below).

Class/Field Notes and Reflections (Section 1 of Journal): I expect you to take notes in your journal during our Tuesday and Thursday class meetings and to make a journal entry outside of class each week based on what we did in class that week. The intent of these weekly journal entries is for you to make sense of what we did in the course that week. In you write ups, consider questions such as: What did I learn? What questions still linger for me? How have I been affected by what I experienced in

class/field? What connections do I see between what happened in class/field this week and in previous weeks, as well as in my life, in general?

Reading Notes and Reflections (Section 2 of Journal): There are reading assignments for each week of this course (about 40 pages of reading per week). Section 2 of your Journal is the place for your notes on the readings as well as your reflections on these readings.

Natural History Project observations, field sketches, and raw data (Section 3 of Journal): In section 3 of your journal, place all the notes, sketches, raw data, observations linked to your Natural History Project.

We will collect your journal and review it three times during the course.

ii-Special Write-ups/Reports (25 points).

I require “lab reports” for the mountain ecology, seed ecology, Allegheny, and ecological footprinting field activities. Details on report format will be provided at the appropriate moment.

iii-Natural History Project (30 points).

We learn by doing. So it is that an important part of Bio 450 is the Natural History Project. This project provides an opportunity to become an *expert* on a species or habitat or ecological question that intrigues you. Steps to becoming an *expert* include:

--Spend lots of time in the field; go at different times of day and night and in different weather conditions. Hone your powers of observation.

--Seek to understand how your organism/community/subject responds to different environmental conditions.

--Figure out how your subject is connected to other processes in the "eco-web."

--Conduct experiment(s) to help gain a fuller understanding of your topic.

--Read extensively on your subject--both books and research papers (at least 6 library journal sources in addition to internet sources).

--Maintain a special Natural History Project Journal.

--Write a formal paper (10-15 typed pages) on your natural history work. The paper should include a description of the question/research problem you addressed, methods employed, results and insights emerging from your project, and, as appropriate, figures, tables, maps, and drawings.

--Present the results of your work in class. Think about how you can best synthesize and

share your work with an audience that is interested but knows little about what you have immersed yourself in for two months.

Note: More guidance on how to proceed with Natural History Project will be given in class.

iv-Ecological Identity Project (5 points)

The Ecological Identity Project is the culminating project of the semester. It will entail expressing your understanding of yourself as an ecological being. The Project is grounded in the knowledge that not all of what we know can be expressed in words. By restricting our learning and striving for understanding to the printed word and verbal exchange, we foreclose a potentially rich realm of knowing. Indeed, for tens of thousands of years humans have engaged in "artful" acts (painting, dance, ritual, drama) to express intuitions and truths that often lie beyond words.

In this spirit, as your culminating action of this course, we invite you to explore and express your ecological self -- your ecological identity -- through an artistic creation using film, drawing, sculpture, music, dance, or a combination of these or any other media (**but no collages please!**). You will formally present your Ecological Identity Project at the potluck dinner to be held immediately following our final class

If you are thinking, "I am not creative; I can't do this." banish the thought." We are all creative in our own ways and as your guide on this Bi 450 journey, I will do my best to lead you to your creative core. All we ask of you is that you jump in with both feet without worry.

v-Synthesis Essay (10 points)

At the end of the semester we will ask you to tie all the themes and learnings of the course together in one thoughtful and comprehensive essay. Your journal (e.g., notes on readings and field exercises) will be an essential resource on crafting your essay.

ATTENDANCE POLICY

Learning in this course involves, first and foremost, your bodily presence. You have to be "on board" or you can't make this journey. So it is that we grant you **ONLY ONE** unexcused absence. **You will be penalized three points for each UNEXCUSED absence beyond one.**

Note: If you miss more than six classes--whether excused or unexcused--you will be dismissed from this class with an F and given the opportunity to change your grade by taking the class

again during the Fall, 2006.

Arriving late to class: I will only excuse **ONE** late arrival. Each **unexcused** late arrival beyond one will be counted as an absence (i.e., you will be penalized three points for each unexcused late arrival beyond one).

EXCELLENCE

Students in the past have found this to be a demanding course. They have discovered that to do well it was necessary to have an inquisitive and open mind and sufficient time and energy to devote to the course. If you are lacking in any of these prerequisites, I suggest that you NOT take this course.