

CSS 560 Ecology:

Syllabus

MOSS Aug. - Nov. 2007

Tom Giesen, Instructor

Text: Chapin et al. Principles of terrestrial ecosystem ecology. Springer, 2002.

Expectations of you:

Be on time

Do the work

Pay attention

ASK about anything you do not understand

Participate in discussions and field trips, ESPECIALLY if you are not following what is going on.

Be very respectful of each other and your instructor. You will likely disagree with other students' and your instructor's views, but please do so with respect.

Expectations of me:

Be on time

Do the work (be ready to teach the class)

Pay attention

Watch for moments when I think you do not understand, and ask you.

Set up discussions and field trips, with special attention to involving everyone.

Be very respectful of you. I will likely disagree with some views expressed, but I will endeavor to do so with respect.

Points of view. Decisions about natural resources are fundamentally an expression of value. All values will be respected in this class. The class, however, is an evidence-based class, and I ask that you support your expressions of your values by evidence. You may say "Well, that's just how I feel" as a form of evidence, but be aware that it is not very persuasive for the purposes of this class.

Research question. Please develop a research question by the end of the semester.

- A research question is a testable question - testable by gathering data from an experiment or from simple observation.
- You must think of such a question, research it in the scientific literature, and figure out how to test it.
- That includes where to test it. Prepare a plat of the area and provide notes showing why you chose that site to go with a written research question and plan.
- It is due a few days before the end of the term.
- Note that testing the question is not required, so don't test it unless you just can't stop yourself

Objective:

I will describe our objectives in two ways:

Informally:

When you finish this semester, I want you to be able to name the state factors, name the seven ecological functions, and describe and discuss each state factor and ecological function. For any broad ecological activity, be able to discuss the state factors and ecological functions that it depends on most. Example: nitrogen cycling depends on organic decomposition processes, and these are controlled by soil animal and microbial populations. Microbial activity is controlled by temperature and moisture, which depend on climate and disturbance, etc. Example: global warming is a climatic result of changes in atmospheric energy flux brought about by a variety of things, but principally by CO₂ emissions resulting from the burning of fossil fuels and deforestation.

Formally:

Objectives - Students must strive to:

- Be able to describe scientific inquiry, explain the processes of quality control in science, and articulate the place of human values in science.

- Understand uncertainty in science, the limits of conclusions, and the frequent need to act despite uncertainty.
- Understand, and be able to explain and apply the five state factors and seven fundamental ecological functions - all of which tie human existence (and survival) to natural processes.
- Apply the above understandings to their local environment.
- Be able to formulate research questions.
- Be able to apply their ecological understanding to contemporary issues in science/policy across the range from local issues to broad issues such as global warming and the energy crisis.

Evaluation:

I will assign a letter grade ABCDF based on

Understandings of the reading and lectures: 20%

A presentation in class 15%

Class, discussion and field trip participation 25%

Your research question and the research behind it 15%

Final exam (end of term, 1 hour, written) 25%

Schedule for block time.

Concentrated sessions: 4 one-day, day-long (9 - 12; 1 - 4:30) sessions

Friday session: 1 one-day, half-day long (9 - 12; 1 - 2) session

Subsequent sessions: 2 one-day, day-long (9 - 12; 1 - 4:30) sessions

Day One

Reading in Chapin, et al. pp 3 - 17

Lecture: Introduction to the Class and to Ecology

Field work: Intro to Ecological Functions & State Factors

Lecture: Jenny's State Factors; Ecological Function(s)

Day Two

Readings in Chapin, et al. 18-20; Review plates between 26 and 27; 31-

32; 41-44; 46-50.

Lecture: Climate and energy flux

Field work: begin to find a research question for your ecology field project.

Lecture: Soil formation and maintenance

Day Three

Readings in Chapin, et al. 71 - 73 (not Box4.1); 78 - 83; 197-202; 222.

Lecture: Hydrological cycle

Field work: Soil profiles; geologic history

Lecture: Nutrient cycling

Day Four

Readings in Chapin, et al. 274 - 277; 285 - 288.

Lecture: Structural and biological diversity

Field work: Decay is good for us.

Lecture: Disturbance and dynamism

Day Five

Readings in Chapin, et al. 97 - 98; Figure 6.1 on 124.

Lecture: Biological productivity

Field work: Evidence of disturbances

Summary of class to date.

All the above work is in five days. The last two classroom days are later in the term, and are Monday - Tuesday.

Day Six

Readings in Chapin, et al. 224-233

Lectures: Aquatic ecosystems

Field work: Payette river above the lake - general observations

Day Seven

Readings in Chapin, et al. 356-359.

Lecture: Human use of ecosystem services

Field work: Finding beneficent human use of ecosystems; looking closely at urban physical structures as ecosystems

Please let me know what questions you have. I am in Cabin D, but often will post a note on my door indicating I am unavailable. The best way to talk is to make an appointment.

I am really looking forward to this class!

Tom