BIO 320 - Fall 2003 Dr. Ned J. Knight
General Ecology Office Hr - Monday 5:30-6:00pm
Mondays 6:00-9:30pm Phone (leave message) - 503-883-2567
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"One touch of nature makes the whole world kin." - William Shakespeare

Welcome! In this course we will examine ecological concepts at several different levels, including organisms, populations, and communities, plus the environments they inhabit.

We will start out with a brief introduction to basic concepts, and then examine the myriad types of environments supporting these organisms. The middle portion of the course will be a consideration of all the biotic and abiotic factors that determine their abundance and distribution. Lastly, we will discuss some of the major human impacts on these organisms, with current efforts to improve the situation, as well as future prospects.

The textbook for the course is Elements of Ecology (5th edition) by Smith and Smith, a contemporary, very readable, and objectively written book.

OBJECTIVES

After completing this course, you should be able to

* Define what ecology is and all it encompasses
* Differentiate between the many specific types of terrestrial and aquatic ecosystems in which organisms are found
* Appreciate the wide variety of physical, chemical, and biological factors that influence the abundance and distribution of organisms
* Recognize the broad range of these influences on organisms, from local to global levels
* Understand the dynamics of populations in both spatial and temporal scales
* Realize the magnitude of human impacts on these natural processes

PARTLY PERSONAL

If you detect a slight accent, you're right! No, I'm not a native Oregonian - I"ve only been here since 1972. That's when I came out here from a suburb of New York City (30 miles east – still much too close!) to go to Oregon State University. I graduated from there in 1977 with two B.S. degrees (zoology and fisheries) and 2 years later with an M.S. degree (fisheries). Then it was down to the University of California at Davis for 4 more years and a Ph.D. (ecology) in 1985, where the summers were way too hot and I couldn't wait to get back up here!

Since 1986 I've been teaching introductory biology laboratories at Reed College, covering a range of subjects each year.

I started teaching at Linfield on the McMinnville campus in 1992. I've been teaching environmental science there, and from one class initially, it grew to four sections and over 200 students each year!

The DCE program advertised for an instructor up at the Portland campus for the summer of 1994, and after filling that role, it's built up to five-six courses a year, one each term and two-three travel ones each summer. So far, I've taught Human Ecosystems, Ecology of Ecosystems, General Ecology, Environmental Issues and the Physical Sciences, Human Ecology, Environmental Problem Solving Seminar, Global Issues (computer-mediated), Field Zoology, and Shoreline Ecology, at the Portland, Salem, Albany, and McMinnville campuses, plus the wonderful Oregon coast in the summer!

TENTATIVE SCHEDULE

Date	Topics	Assignment Due	Presentation Topic
September 15	Introduction		
September 22	Abiotic factors	Presentation topic choices	
September 29	Photosynthesis Primary productivity	Ch. 4 (p. 77)	
October 6	Population properties and growth	Ch. 6 (p. 122)	
October 11	FIELD DAY !		
October 13	Population regulation Life histories	Field day essay	1,2
October 20	Community structure	Ch. 9 (p. 184)	3,4
October 27	Species interactions	Ch. 12 (p. 234-235)	5, 6
November 3	Ecosystem productivity Ecological succession	Ch. 13 (p. 267)	7, 8
November 10	Terrestrial ecosystems Aquatic ecosystems	Ch. 20 (p. 415)	9, 10
November 17	Nutrient cycling	Ch. 27 (p. 559-560)	11,12
November 24	Thanksgiving Week – NO CLASS!		
December 1	Landscape ecology Global ecology	Ch. 21 (p. 432)	13, 14
December 8	Human impacts - pollution	Ch. 19 (p. 388)	15, 16
December 15	Human impacts - agriculture - deforestation	Final	

CHAPTER ASSIGNMENTS

At the end of each chapter in the textbook are several Study Questions. We will cover some of the basic information in the week prior to when each assignment is due (see the schedule). You'll

notice that several of these questions are rather mechanical, but some are more interpretive in nature. I've chosen four of the more interpretive ones in each chapter:

Chapter	Page	Questions	Chapter	Page	Questions
4	77	2, 5, 9, 13	20	415	3, 5, 7, 12
6	122	9, 11, 12, 17	27	559-560	4, 8, 10, 18
9	184	1, 3, 6, 8	21	472	5, 7, 8, 9
12	234-235	4, 10, 12, 13	19	388	2, 5, 6, 8
13	267	4, 6, 11, 12			

For each assignment, read the appropriate chapter, then choose one (1) of the above corresponding questions at the end that's of particular interest to you. Your answer should be a maximum of one (1) page typewritten, computer output, or legible handwriting, though if necessary, a slight spillover on to a second page is OK (or how about smaller margins or fonts?!)

These questions are to be answered individually, and some of them are somewhat open-ended in nature. For these types, there is no one right or wrong answer to them. But regardless of the nature of the question, be sure in your answer to include some details, numbers, etc. to support your statements. The only requirement is to start by stating the question on top of each page. (Note: no outside references are required for these!). And lastly, each assignment will be worth 10 points.

PRESENTATIONS

Listed on the next page are 36 topics of ecological importance - which ones interest you?

Each of you will have a chance to give an oral presentation on a topic of your choice, within the list. It's up to you how you'd like to organize it, but one very general approach is the following:

Conceptual Introduction
Original Study or Studies
Recent Updates and/or Modifications

We'll have up to an hour of class time on the particular days for the oral part (see the schedule), including fielding questions from others. We'll start the evening with the presentations, then proceed after break to the other topics on the schedule.

For the date of your presentation, see the circled green number on the top right corner of the first page of this syllabus, and then find the corresponding evening in the schedule above.

Due Next Week (September 22): Look at the list of topics below and choose five (5) of interest. There is some information on most of them in the text (you can check the index and/or glossary) if some are unfamiliar to you at this point. Then, on a sheet of paper (legible handwriting is fine!), put your name and the five topics, in your order of preference. I'll get your list returned to you by the end of the same evening, so you'll know which topic you can investigate.

Potential Topics (in no particular order)

Resource partitioning	Stratification	Mycorrhizae

Optimal foraging	Mangrove forests	Niche concepts
Ecological release	River continuum concept	Biological magnification
Mimicry	Endothermic plants	Upwelling
Allelopathy	Cultural eutrophication	Phototaxis
Pheromones	Community stability	Self-thinning
Photoperiodism	r and K selection	Desertification
Character displacement	Territoriality	Wetlands mitigation
Keystone species	Acclimatization	Epiphytes
Polymorphism	Biological clocks	Prescribed burns
Island biogeography	Altruism	Co-evolution
Restoration ecology	Bioluminescence	Carrying capacity

In addition to the oral presentation, you should prepare and submit on the same evening a written paper of your topic. This paper should be a maximum of five (5) pages in length (typewritten or computer output, double-spaced, please) and should include a minimum of four (4) outside sources. These sources can be anything except your class notes or text (but you may find some useful websites linked to The Ecology Place website). That means articles, books, pamphlets, personal interviews, etc. are all fine! If you want to research your topic on the Internet, make sure you are using reputable, published sources. Anyway, be sure to cite your sources in your text where appropriate, such as after details or short quotations, and give the complete reference listings at the end. See the attached handout on Citations and References for proper formats for scientific papers.

The entire presentation (oral and written) will be worth 100 points, divided into 30 points oral and 70 points written.

ATTENDANCE

For your maximum value and enrichment from the course material, full attendance for the entire class time each evening is expected.

FIELD DAY !

Saturday, October 11 at 9am - we will meet here, then head out for an enjoyable day of examining some local ecology-related activities. We will do our own carpooling from the parking lot outside, bring a brown-bag lunch, and we'll be back by 6:00pm. You're welcome to bring a clipboard or small notebook to take notes if you like.

Due on Monday, October 13 (while it's still fresh in your mind!) - a one-two page essay critique (10 points) on what you saw, focusing on the following two questions where appropriate:

1. Did anything impress you at each site?
2. Would you do anything differently from what you saw being done?

FINAL EXAM

There will be a take-home final exam, available Monday, December 8 and due Monday, December 15, worth 50 points.

GRADING

The course will be worth a total of 250 points, derived from the following: nine chapter assignments (90 pts), presentation (100 pts), field day critique (10 pts), and final exam (50 pts). At this point, I anticipate the typical 90%, 80%, and 70% cut-off levels for A, B, and C, but if everyone's totals end up on the low side, I have no problem at all in lowering those percentages!

Addendum: Late papers - we all dislike late papers, particularly those of us who put forth the extra effort to get them in on time. Therefore, I feel compelled to deduct 20% for each week one of your assignments is late, without a valid reason. Then again, for your work, surely that won't be a problem!

SPECIAL NEEDS ?

If you have any documented disabilities that may need accommodations, any medical information I should know of, or need special arrangements in the event of an evacuation, please see me as soon as possible. Thanks!

CITATIONS AND REFERENCES - The Science Way

(adapted from the CBE Style Manual)

In-Text Citations

These could be direct citations:

Smith and Wesson (1991) lobbied against gun control.

or indirect citations:

There was an active lobby against gun control (Smith and Wesson, 1991).

General Rules:

1. Cite your source for specific details, examples, etc. and for any direct quotes (though direct quotes are seldom used in scientific papers).
2. General format: (author, year)

    a. No author? Use (Anonymous, year)

    The Forest Dragons have been drawing small crowds to the Coliseum (Anonymous, 1999).

    b. If two (or more) articles by the same author in the same year, use a and b after the year in the text and reference listing at the end, to keep them distinct

    Last year's movies are back again for the Oscars (Mahar, 2002b).

    c. Internet source? Use (author, year the site was last updated), or if no author, use (Anonymous,year updated)

    Methyl chloroform levels have declined in the stratosphere (Anonymous, 2001).

    Important Exception: If your Internet source is from a published format (newspaper, magazine, etc.), cite the published source instead, using the year of publication.

    d. Multiple authors? If two, cite both names; if more, use "and others" after the first author

    Mexico City has had the worst air pollution in the last decade (Talbot and others, 2000).

    e. Personal interview (or communication). Format: (Person. year date. position, city. Personal communication)

    According to DW Anderson (1998 Oct 28. Architect, Knob Hill Designers, Beaverton, OR, Personal communication), the 30-ft high sculpture was an appropriate entrance to the Silicon Forest.

    Note: These go in your text only, not in the reference listing at the end.

References (or Bibliography)

This should appear at the end of your paper, and should be a complete listing of every source cited in your text (except any personal communication).

A. General Formats:

1. Journal or magazine articles: Author(s). Year. Title. Source. Volume:Pages.

   Smith IM, Wesson UR. 1991. Gun control is not for everyone. Rifleman 54:32-36.

2. Books: Author(s). Year. Title. City published: Publisher.

   Brown LR. 1997. Tough choices: facing the challenge of food scarcity. Washington, D.C.: Worldwatch Institute.

3. Article within a book: Author(s). Year. Title. Pages in Book ed. Title. City published: Publisher.

   Wilson EO. 2003. What is nature worth? Pages 121-130 in Allen JL, ed. Annual editions: environment 03/04. Guilford, CT: McGraw-Hill/Dushkin.

4. Newspaper articles: Author(s). Year date. Title. Newspaper; Section pages.

   Eggers K, Jaynes D. 1998 Mar 29. Trailblazers have a decent season after all. Oregonian; Section E1-E2.

5. Internet: Author(s). Year date last updated. Title. <Web site address> Date you accessed.

   Papadopoulos G. 2001 Mar 15. Aquaculture in Greece expands rapidly. < http://www.grfishaq.html > Accessed 2003 Aug 29.

   Important Exception: Again, if it's a published source, use that information here instead of the web address. That is, don't assume every reader has Internet access.

B. Multiple authors? List them all, in the same order they appear in the source.

   Talbot GM, Svoboda PR, Payne SW, Enfield KS. 2000. Mexico City: air pollution nightmare. Environmental Science and Toxicology 17:433-440.

C. No authors? Start with [Anonymous]

   [Anonymous]. 1999 May 28. Forest Dragons vie for recognition in Portland. Oregonian; Section E3.

D. Same author with two or more articles in the same year? Use a, b, c, etc. after the year, to correspond with your in-text citations

   Mahar T. 2002a Apr 1. Oscars yield few surprises. Oregonian; Section D1-D2.

   Mahar T. 2002b Apr 4. Oscar winner movies see attendance rise. Oregonian; Section D5.

E. Let's put it all together:

References

[Anonymous]. 1999 May 28. Forest Dragons vie for recognition in Portland. Oregonian; Section E3.

Brown LR. 1997. Tough choices: facing the challenges of food scarcity. Washington, D.C.: Worldwatch Institute.

Eggers K, Jaynes D. 1998 Mar 29. Trailblazers have a decent season after all. Oregonian; Section E1-E2.

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Smith IM, Wesson UR. 1991. Gun control is not for everyone. Rifleman 54:32-36.

Talbot GM, Svoboda PR, Payne SW, Enfield KS. 2000. Mexico City: air pollution nightmare. Environmental Science and Toxicology 17:433-440.

Wilson EO. 2003. What is nature worth? Pages 121-130 in Allen JL, ed. Annual editions: environment 03/04. Guilford, CT: McGraw-Hill/Dushkin.

Notice the listing is alphabetized, by the first author's last name (or word).

F. Now that you have all the "Do's", just a few brief "Don'ts":

1. Don't use footnotes in your text for sources.
2. Don't cite more than (author year) in your text (except personal communications).
3. Don't include complete references at the end for sources not cited in your text.
4. Don't cite sources in your text without giving the complete listing at the end (again, except personal communications).

Note: The ***Italics*** used above are just for clarity - they're not needed in your papers