Course Syllabus

BIOL 466: Terrestrial Ecosystems
Spring 2005

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Research Laboratory: SL3209C **Favourite Colour: Blue (no, Red!)**

Ecosystem ecology is a subdiscipline within ecology that deals with energy flow and nutrient and material cycling through landscapes or elements thereof. Ecosystem ecology represents a unique *approach* to asking ecological questions as much as (or more than) particular types of ecological questions *per se*, and as such, is a discipline to which not many students get exposed. It is, however, an area of active research nationally and internationally, and perspectives gained from the "ecosystem approach" have proven very valuable to conservation biologists, natural resource management agencies, and governments at all levels.

Objectives of the Course:

- δ To encourage recognition of an "ecosystem approach" to understanding natural and anthropogenic environments;
- δ To understand major pathways by which carbon, nitrogen, phosphorus and water cycle, and energy passes through, ecosystems;
- δ To reconcile the apparently contradictory "taxonomic blindness" versus "taxonomic primacy" embodied within the ecosystem concept;
- δ To recognize the value of various ecosystem states and conditions to human society.

Grading:

Your grade will be based on your performance on three lecture exams valued at 100 points each, four writing assignments/discussion exercises valued at 80 points each, and a pseudo-cumulative final exam valued at 150 points, for a total of 770 points total in the course. I will initially use a straight scale to determine grades (90 - 100% of 770 = A, 80 - 89% = B, 70 -

79% = C, 60 - 69% = D, and < 60% = F), but I may curve in favor of the class if appropriate. I will not curve grades against the class (i.e, if you earn 82% of 770 points, you'll get at least a B regardless of what everyone else does in the course). I do not curve grades formally until the end of the course, but I will provide informal "curves" during the semester so that you know where you stand. Be sure to retain all graded material that is returned to you.

Grading Philosophy:

I typically operate under a fairly simple grading rule: your grade is your business. Recognize that grades are a reflection of achievement, not of effort. I do not *give* you a grade; rather, you *earn* a particular grade. I consider myself to be a very fair test-writer and grader. If you perform below your expectations on a particular exam or assignment, I will not entertain the notion that this is somehow my fault. *However*, that being said, I am fully cognizant that I *am* human and that I *can* (and admittedly sometimes *do*) make logistical and/or judgement errors in grading. I am very willing to address any such errors as long as they are brought to my attention in a timely fashion. I am also interested in having all students perform as well as they can in this class. I encourage you to ask questions during lecture, come to my office hours, make appointments to see me and ask questions, use e-mail to contact me and ask questions, and work together with your colleagues in this class as much as you can.

Attendance/Participation:

Attendance in lecture is not absolutely required, but strongly advised. You will be responsible for *everything* discussed in lecture regardless of its nature (e.g., information not present in any readings, material on handouts, changes in test dates, etc.), and this will hold regardless of whether or not you attended lecture on any particular day.

Tentative Schedule of Lecture Topics and Exams

Date	Topic	Reading(s)
Jan 10	Introductory Material; Course Mechanics	-----
Jan 12	Biological Organization-The Ecosystem Concept; Definitions	Ch. 1
Jan 14	History of Ecosystem Ecology; Biomes	Ch. 1; Ch. 2; Papers
Jan 17	Measurement of Ecosystem Function: Carbon	Ch. 3
Jan 19	Measurement of Ecosystem Function: Water & Nutrients	Ch. 4
Jan 21	Measurement of Ecosystem Function: Water & Nutrients	Ch. 4
Jan 24	Further Techniques in Ecosystem Function	Ch. 5
Jan 26	Soil Dynamics: Weathering / Formation	Ch. 9
Jan 28	Soil Dynamics: Biological Processes	Ch. 10
Jan 31	Soil Dynamics: Biological Processes	Ch. 10
Feb 2	Energy and Carbon Balance in Plants	Ch. 6
Feb 4	Plant Effects on Ecosystem Hydrologic Cycle	Ch. 7
Feb 7	The Big Kahuna: Net Primary Production	Ch. 11
Feb 9	Net Primary Production	Ch. 11; Papers
Feb 11	**Exam #1**	**Exam #1**
Feb 14	Where Doth Production Go? Litter-fall & Decomposition	Ch. 12
Feb 16	Decomposition and Development of Humus	Ch. 12
Feb 18	Decomposition and Nutrients	Ch. 13
Feb 21	Nutrient Cycling I: Carbon	Ch. 14; Papers
Feb 23	Nutrient Cycling II: Nitrogen	Ch. 14; Papers
Feb 25	Nutrient Cycling II: Nitrogen	Ch. 14; Papers
Feb 28	Nutrient Cycling III: Phosphorus	Ch 14; Papers
Mar 2	TOTP: Herbivory and Secondary Production	Ch. 15; Papers
Mar 4	Ecosystem Structure & Function: Herbivores	Ch. 16; Papers
Mar 14	Ecosystem Structure & Function: Herbivores	Ch. 16
Mar 16	Ecosystem Regulation: Canopy Structure	Ch. 8
Mar 18	Ecosystem Regulation: Canopy Structure	Ch. 8
Mar 14	Ecosystem Regulation: Fire	Ch. 17; Papers
Mar 16	Ecosystem Regulation: Fire	Ch. 17; Ch. 19

Mar 18	**Exam #2**	**Exam #2**
Mar 21	Ecosystem Regulation: Gap / Patch Dynamics	Ch. 21; Papers
Mar 23	Ecosystem Regulation: Other Disturbances	Papers
Mar 25	Biodiversity and Ecosystem Function	Ch. 24
Mar 28	Biodiversity and Ecosystem Function	Ch. 24
Mar 30	Swordplants and Grizzlies and Moths, Oh My!	Papers
Apr 1	Swordplants and Grizzlies and Moths, Oh My!	Papers
Apr 4	Case Study: The Serengeti Plains	Ch. 20
Apr 6	Case Study: Hawaiian Islands	Ch. 22
Apr 8	Further Case Studies	Papers
Apr 11	Concept of Ecosystem Services	Ch. 18; Papers
Apr 13	Ecosystem Services / Ecosystem Valuation	Papers
Apr 15	**Exam #3**	**Exam #3**
Apr 18	Human Impacts on Ecosystems	Ch. 25
Apr 20	Human Impacts on Global Cycles	Ch. 26
Apr 22	Conservation Biology and Ecosystems	Papers
Apr 25	Conservation Biology and Ecosystems	Papers
Apr 27	Open	
Apr 29	Open	

Final Exam: Tuesday May 3, 10:00 - 11:40 am