



I propose to convert Ecosystem Ecology to an Oral-Intensive course. The proposed change is motivated by a need for students to gain skills in oral presentation and discussion. *Ecosystem Ecology* is a

The attached syllabus must clearly reflect the following basic elements for the ORAL COMMUNICATION emphasis requested. Please note them directly on the syllabus, using the corresponding letter. (See Guidelines in this manual.)

**GROUP (medium or large class)** (Regularly enrolling at least 12 students)

- |          |   |
|----------|---|
| <b>A</b> | 15% of the final grade based on oral communication    |
| <b>B</b> | 1 ongoing, integrated group project with 5-8 students |
| <b>C</b> | 2 presentations (minimum of 5 minutes per member)     |

**E** Group and Individual grading  
**F** Instructor Evaluation/Feedback on class

**PUBLIC (medium or large class)** (Regularly enrolling at least 12 students)

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| <b>A</b> | 15% of the final grade based on oral communication |
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APPROVALS?

AA

CA 01/2018

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**Ecosystem Ecology**  
Biology 476 (3 credits)  
Spring 2013

Instructor: Tamara Harms  
Office: 120 Arctic Health Research Building  
Email: tkharms@alaska.edu  
Office hours:

Prerequisites: Introductory Ecology

Course materials

Textbook: Chapin, F.S., III, P.A. Matson, and H.A. Mooney. 2011. Principles of

~~Terrestrial Ecosystem Ecology, 2<sup>nd</sup> edition, Springer-Verlag, New York. The text is~~

available on the internet

Chapters as assigned from: Schlesinger, W.H. 2007. Biogeochemistry: An Analysis of

experiment. Each student will be responsible for presenting an informal, individual  
summary of mid-term results, and a final group presentation will synthesize individual

results with contributions from each student.

#### Objectives

-Describe the major ecosystem processes and the factors influencing process rates (in

written and oral forms)

- Apply the scientific method to ecosystem problems
- Analyze ecosystem processes using quantitative methods
- Read, analyze, and discuss scientific literature

#### Instructional methods

Class periods will include lectures, discussions, problem sets, and short written  
exercises. I will establish an atmosphere that encourages interaction. Your participation

session will follow each presentation (D). Students will receive instructor

feedback following presentations, which is to be incorporated into the final

from all experiments (B). Each student will present during the final session (C).

Schedule

Jan 17 (Thurs)

- Course mechanics
- Problem-solving
- Introduction to C cycle and decomposition

Jan 22 (Tues)

- How to read scientific papers
- Structure and goals of scientific discussions
- Discussion: Decomposition, Hobbie 1996

*Reading: p. 151-175 in Chapin et al., Hobbie 1996 Ecological Monographs*

Jan 24 (Thurs)

- Field trip to various West Ridge sites
- Design decomposition experiments

Jan 29 (Tues)

*Ecosystem concept and history:*

*Reading: p. 3-13 in Chapin et al.*

Jan 24 (Thurs)

- Climate, atmosphere, and ocean circulation
- Discussion: history and development of the ecosystem concept, Tansley, Gleeson, and Clements

*Reading: Excerpts from Tansley, Gleeson, and Clements*

Jan 29 (Tues)



Feb 12 (Tues)

-Metabolism

-Productivity

*Reading: p. 97-150 in Chapin et al.*

Feb 14 (Thurs)

-Decomposition

-Discussion: trophic effects on whole ecosystem metabolism, Schindler et al.

*Reading: p. 151-175 in Chapin et al., Schindler et al. 1997 Science*

Feb 19 (Tues)

-Carbon cycle

-Weigh litterbags

*Reading: p. 358-382 in Schlesinger,*

Feb 21 (Thurs)

-Nitrogen cycle

*Reading: p. 197-215 in Chapin et al.,*

Feb 26 (Tues)

N cycle

*Reading: p. 383-396 in Schlesinger*

Feb 28 (Thurs)

-N cycle

-Discussion: small watershed approach, Likens et al.

*Reading: Likens et al. 1970 Ecological Monographs*

Mar 5 (Tues)

-P cycle

-Weigh litterbags

*Reading: p. 215-219 in Chapin*

-Stoichiometry  
-Weigh litterbags  
*Reading: Elser et al. 2000 Ecology Letters*

Mar 28 (Thurs)  
-Stoichiometry  
-Discussion: ecological stoichiometry, Cross et al.  
*Reading: Cross et al. 2003 Ecology Letters*

Apr 2 (Tues)  
-Succession  
-Weigh litterbags  
*Reading: p. 281-304 in Chapin et al.*

Apr 4 (Thurs)  
-Succession  
-Discussion: Vitousek & Reiners  
*Reading: Vitousek & Reiners 1975 Bioscience*

Apr 9 (Tues)  
-Ecosystem services  
~~Final in-class analysis of decomposition data~~

-Sustainability  
-Discussion: ecosystem services, Foley et al.  
*Reading: Foley et al. 2005*

Apr 16 (Tues)  
-Resilience  
-Informal summaries of preliminary decomposition results  
*Reading: p. 356-369 in Chapin et al.*

Apr 18 (Thurs)  
-Socio-ecological systems  
-Discussion: regime change, Scheffer et al.  
*Reading: Scheffer et al. 2001*

Reading: Leach, Guldborg et al. 2007 Science

May 2 (Thurs)

- Decomposition presentation
- Recap and review

May 7-10: Final exams

Decomposition lab report due