FORMAT 2

Submit originals (including syllabus) and one copy and electronic copy to the **Faculty Senate Office**
See http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/ for a complete description of the rules governing curriculum & course changes.

CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL

Attach a syllabus, except if dropping a course.

SUBMITTED BY:

Department	**Biology & Wildlife**	**College/School**	**CNSM**
Prepared by	**Tamara Harms**	**Phone**	**474-6117**
Email Contact	**tkharms@alaska.edu**	**Faculty Contact**	**Tamara Harms**

1. COURSE IDENTIFICATION: As the course now exists.

Dept	BIOL	Course #	476 O	No. of Credits	3

COURSE TITLE	Ecosystem Ecology

2. ACTION DESIRED: √ Check the changes to be made to the existing course.

Change Course	X	If Change, indicate below what is changing.	Drop Course	

NUMBER		**TITLE**		**DESCRIPTION**	X
PREREQUISITES*				***FREQUENCY OF OFFERING***	X

*Prerequisites will be *required* before a student is allowed to enroll in the course.

CREDITS (including credit distribution)		3.0+0.5	***COURSE CLASSIFICATION***	O	
ADD A STACKED LEVEL (400/600) Include syllabi.		Dept.		Course #	

How will the two course levels differ from each other? How will each be taught at the appropriate level?:	

Stacked course applications are reviewed by the (Undergraduate) Curricular Review Committee and by the Graduate Academic and Advising Committee. Creating two different syllabi—undergraduate and graduate versions—will help emphasize the different qualities of what are supposed to be two different courses. The committees will determine: 1) whether the two versions are sufficiently different (i.e. is there undergraduate and graduate level content being offered); 2) are undergraduates being overtaxed?; 3) are graduate students being undertaxed? In this context, the committees are looking out for the interests of the students taking the course. Typically, if either committee has qualms, they both do. More info online – see URL at top of this page.

ADD NEW CROSS-LISTING		Dept. & No.		Requires approval of both departments and deans involved. Add lines at end of form for additional signatures.
STOP EXISTING CROSS-LISTING		Dept. & No.		Requires notification of other department(s) and mutual agreement. Attach copy of email or memo.
OTHER (specify)				

3. COURSE FORMAT

NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council **and** the appropriate Faculty Senate curriculum committee. Furthermore, **any core course compressed to less than six weeks must be approved by the Core Review Committee.**

COURSE FORMAT: (check **all** that apply)	1	2	3	4	5	x 6 *weeks to full semester*

OTHER FORMAT (specify all that apply)	
Mode of delivery (specify lecture, field trips, labs, etc.)	**lecture, lab, field trips**

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SEP 30 2014

Dean's Office
College of Natural Science & Mathematics

Governance 10/3/14 TLP

4. **COURSE CLASSIFICATIONS**: (undergraduate courses only. Use approved criteria found in Chapter 12 of the curriculum manual. If justification is needed, attach separate sheet.)

H = Humanities		S = Social Sciences	

Will this course be used to fulfill a requirement for the baccalaureate core?	YES	x	NO	

IF YES*, check which core requirements it could be used to fulfill:

O = Oral Intensive, *Format 6 also submitted	x	W = Writing Intensive, *Format 7 submitted		X = Baccalaureate Core	

4.A ***Is course content related to northern, arctic or circumpolar studies? If yes, a "snowflake" symbol will be added in the printed Catalog, and flagged in Banner.***

YES	x	NO	

5. **COURSE REPEATABILITY:**

Is this course repeatable for credit?	YES		NO	x

Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).	

How many times may the course be repeated for credit?		TIMES

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course?		CREDITS

6. ***COMPLETE CATALOG DESCRIPTION including dept., number, title, credits, credit distribution, cross-listings and/or stacking, clearly showing the changes you want made. (Underline new wording ~~strike-through-old-wording~~ and use complete catalog format including dept., number, title, credits and cross-listed and stacked.)***

Example of a complete description:

PS F450 Comparative ~~Aboriginal~~ Indigenous Rights and Policies (s)
3 Credits
Offered As Demand Warrants
~~Case study~~ Comparative approach ~~in assessing Aboriginal~~ to analyzing Indigenous rights and policies in different nation-state systems. ~~Seven Aboriginal situations~~ Multiple countries and specific policy developments examined for factors promoting or limiting self-determination. Prerequisites: Upper division standing or permission of instructor. (Cross-listed with ANS F450.) (3+0)

Focus on the biological and physical principles that govern functioning of terrestrial and freshwater ecosystems~~.~~ with ~~E~~emphasis on ~~how plants, animals and microorganisms~~ flux of energy, water, carbon and nutrients through ecosystems. ~~Discussion of how changes in these processes have altered global cycles of carbon, water and nutrients and sustainability of the world's ecosystems.~~ Includes discussion of scientific literature and collection of original data. Special fees apply. Prerequisites: ENGL F111X; ENGL F211X or F213X; COMM F131X or F141X; BIOL F371; ~~BIOL F239~~, STAT 200; or permission of instructor. ~~(3.0)~~ (3.0+0.5)

7. ***COMPLETE CATALOG DESCRIPTION AS IT SHOULD APPEAR AFTER ALL CHANGES ARE MADE:***

Focus on the biological and physical principles that govern functioning of terrestrial ecosystems. Emphasis on how plants, animals and microorganisms control the movement of water, carbon and nutrients through ecosystems. Includes discussion of scientific literature and collection of original data. Special fees apply. Prerequisites: ENGL F111X; ENGL F211X or F213X; COMM F131X or F141X; BIOL F371; STAT 200; or permission of instructor. (3.0+0.5)

8. ***GRADING SYSTEM: Specify only one.***

LETTER:	x	PASS/FAIL:	

9. ***ESTIMATED IMPACT***

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

Change will require assignment of a laboratory space 1h/wk in addition to the classroom.

10. LIBRARY COLLECTIONS

Have you contacted the library collection development officer (kljensen@alaska.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

No	x	Yes		currently available resources are adequate

11. IMPACTS ON PROGRAMS/DEPTS:

What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

Biology & Wildlife

12. POSITIVE AND NEGATIVE IMPACTS

*Please specify **positive and negative** impacts on other courses, programs and departments resulting from the proposed action.*

13. JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If you ask for a change in # of credits, explain why; are you increasing the amount of material covered in the class? If you drop a prerequisite, is it because the material is covered elsewhere? If course is changing to stacked (400/600), explain higher level of effort and performance required on part of students earning graduate credit. Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the course is not compromised as a result.

Requested changes include: 1) Update the contact hours and course description to reflect actual distribution of time to lecture and laboratory (data collection and analysis) components, 2) offer course fall semester, odd years, which is necessary to accommodate the instructor's research schedule, and 3) Modify the pre-requisites such that Ecology (Biol 371) and Introductory Statistics (Stat 200) are required in addition to the English and Communications courses required for this oral-intensive course. Ecology provides essential foundational knowledge to succeed in the Ecosystems course, and background in statistics is required to analyze original data collected during the course.

APPROVALS: (Forms with missing signatures will be returned. Additional signature blocks may be added as necessary.)

	Date	9/30/14
Signature, Chair, Program/Department of:	BWL	
	Date	9-30-14
Signature, Chair, College/School Curriculum Council for:	CNSM	
	Date	10/3/14
Signature, Dean, College/School of:	CNSM	

Offerings above the level of approved programs must be approved in advance by the Provost (e.g., non-graduate level program offering of a 600-level course):

	Date	
Signature of Provost (if applicable)		

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE.

	Date	

Signature, Chair
Faculty Senate Review Committee: ___Curriculum Review ___GAAC

___Core Review ___SADAC

ADDITIONAL SIGNATURES: (As needed for cross-listing and/or stacking; add more blocks as necessary.)

	Date	

Signature, Chair, Program/Department of:

	Date	

Signature, Chair, College/School Curriculum Council for:

	Date	

Signature, Dean, College/School of:

Note: If removing a cross-listing, you may attach copy of email or memo to indicate mutual agreement of this action by the affected department(s).

If degree programs are affected, a Format 5 program change form must also be submitted.

Ecosystem Ecology
Biology 476 (3 credits)

Instructor: Tamara Harms
Office: 120 Arctic Health Research Building
Email: tkharms@alaska.edu
Office hours: T 11-12, TH 3:30-4:30, or by appointment
AHRB 120 or 153 (location posted on Bb)

Prerequisites: Introductory Ecology (Biol 371) and Introductory Statistics (Stat 200), ENGL F111X; ENGL F211X or F213X; COMM F131X or F141X

Course materials

Textbook: Chapin, F.S., III, P.A. Matson, and P.M. Vitousek. 2011. Principles of Terrestrial Ecosystem Ecology. 2nd edition. Springer-Verlag, New York.
Chapters as assigned from: Schlesinger, W.H. 2007. Biogeochemistry: An Analysis of Global Change. 2nd edition. Academic Press. Available on Blackboard.
Peer-reviewed papers: As assigned for discussion sessions. Available on Blackboard

Course description

Ecosystem ecology is the scientific study of the interactions, including feedbacks, among organisms and the non-living environment. The first part of the course provides an introduction to the ecosystem concept and the historical development of the field. Next, we survey the environmental factors (e.g., climate and soils) that govern ecosystem processes. We then discuss the major ecosystem processes and mechanisms driving them. Finally, we integrate this information to consider ecosystem services, sustainability, and responses of ecosystems to global change.

Oral-Intensive (O) Course

This course is designated as an Oral-Intensive (O) course. Oral activities in this course will follow these guidelines:
-A minimum of 15% of the graded work in the O course will be based on effectiveness of oral communications
-Students will receive intermediate instructor assistance in developing presentational competency
-Students will use their communication competency across the span of the semester, not just in a final project
-Students will receive instructor feedback on the success of their efforts at each stage of preparing their presentations

Specific course components that meet the O requirement:
1) Lead and participate in discussions of scientific literature. The instructor will provide lecture material on effective scientific discussions and engage students in generating an outline of discussion leadership and participation strategies. Students will receive input from the instructor on individual discussion agendas prior to leading the discussion, and a written evaluation following submission of a discussion summary by the student.

2) Students will present a collaborative summary of a semester-long laboratory

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.

Student learning outcomes
–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 will contribute to the success of the course.

Grades and assignments
Participation in class discussions/activities 10%
Discussion leadership 15%
Decomposition lab report 15%
Decomposition group presentation 10%
Midterm 25%
Final 25%

Assignments turned in after due dates will receive reduced credit.

The instructor reserves the right to modify the final grade in consideration of notable progress demonstrated by an individual, or unforeseen and extenuating circumstances. In such cases, extra credit assignments and/or makeup work may be assigned at the discretion of the instructor.

Course syllabus may be modified at the discretion of the instructor.

Student responsibilities
1) Participate in class sessions. Full participation will require completion of all assigned readings before class.

2) Lead discussion of scientific papers as assigned. Responsibilities of discussion leaders include:
   –Submit a planned agenda for the discussion 1 week before the in-class discussion.
   –Meet with the instructor during office hours to modify the agenda. Meetings outside of office hours must be *scheduled at least 1 week in advance*.
   –Submit a written synopsis of the discussion that includes: a) the key points or issues that emerged during the discussion, and b) a self-evaluation of discussion leadership. *Due within 1 week* of the discussion session.

3) Laboratory: decomposition project
   –Each individual will design and complete laboratory or field work studying an aspect of decomposition and soil respiration
   –Students will report on preliminary results in class Mar 28. A question & answer

session will follow each presentation. Students will receive instructor feedback following presentations, which is to be incorporated into the final presentation.

–Students will collaborate to produce a final group presentation, synthesizing results from all experiments. Each student will present during the final session, with grades assigned individually and for the entire group. A question & answer period will follow, with questions from the instructor and guest panelists.

4) Communication

–Check Blackboard site frequently. All course announcements and assignments will be posted on Blackboard

–Read and respond to UAF email in a timely fashion

–Include BIOL 476 in the subject line in all email correspondence with instructor

Student Code of Conduct

The UAF code of conduct details expectations of graded student work and is available at http://www.uaf.edu/catalog/current/academics/regs3.html. Collaboration on exams and written lab reports is not allowed in this course. The code of conduct states that "students will not represent the work of others as their own." In this course this includes the work of other students, as well as plagiarism of the published work of other authors. Plagiarism is grounds for course failure. Explanations of plagiarism and how to properly cite sources are available from UAF libraries:
http://www.uaf.edu/library/instruction/handouts/Plagiarism.html.
http://www.uaf.edu/library/instruction/handouts/Citing.html

UAF Policies Disabilities Services

The University of Alaska Fairbanks is committed to providing equal access for students with disabilities. The Office of Disability Services implements the Americans with Disabilities Act (ADA) and insures that UAF students have equal access to the campus and course materials. The instructor will work with the Office of Disabilities Services (208 Whitaker, 474-5655) to provide reasonable accommodation to students with disabilities. If you have a physical or learning disability, please advise us in writing of any special consideration necessary by the beginning of the second class.

Course schedule

Jan 17 (Thurs)
- -Course mechanics
- -Problem-solving in ecosystem ecology
- -Assignment of discussion leaders

Jan 22 (Tues)
- -Ecosystem concept and history
- -Discussion: history and development of the ecosystem concept; Tansley, Gleason, and Clements

Reading: p. 3-22 in Chapin et al., excerpts from Tansley, Gleason, and Clements

Jan 24 (Thurs)
- -Climate, atmosphere, and ocean circulation
- -How to read scientific papers

Reading: p. 23-50 in Chapin et al.

Jan 29 (Tues)
- -Structure and goals of scientific discussions
- -Discussion: Decomposition, Hobbie 1996

Reading: p. 183-208 in Chapin et al., Hobbie 1996 Ecological Monographs

Jan 31 (Thurs)
- -Field trip to various West Ridge sites
- -Design decomposition experiments
- -Construct litterbags, soda lime chambers

Feb 1 (Fri): Drop deadline

Feb 5 (Tues)
- -Energy balance
- -Set up experiments

Reading: *p. 93-100 in Chapin et al.*

Feb 7 (Thurs)
- -Lithosphere: state factors, soils

Reading: p. 63-90 in Chapin et al.

Feb 12 (Tues)
- -Hydrologic cycle
- -Discussion: Chronosequence approach, Vitousek & Farrington

Reading: p. 100-122, 403-407 in Chapin et al., Vitousek & Farrington 1997
- -Weigh litterbags

Feb 14 (Thurs)
- -Metabolism
- -Productivity

Reading: p. 123-181 in Chapin et al.

Feb 19 (Tues)
- -Decomposition

-Discussion: trophic effects on whole ecosystem metabolism, Schindler et al.
Reading: p. 183-208 in Chapin et al., Schindler et al. 1997 Science
-Weigh litterbags

Feb 21 (Thurs)
-Carbon cycle
Reading: p. 407-414 in Chapin, p. 358-382 in Schlesinger

Feb 26 (Tues)
-Global patterns in primary productivity
-C turnover/residence time exercise: bring calculators/laptops
Reading: p. 50-62, 177-181 in Chapin
-Weigh litterbags

Feb 28 (Thurs)
-Nitrogen cycle
Reading: p. 259-286, 414-418 in Chapin et al., p. 383-396 in Schlesinger

Mar 5 (Tues)
-Nitrogen cycle
-Small watershed approach
-Discussion: small watershed approach, Likens et al.
Reading: Likens et al. 1970 Ecological Monographs
-Weigh litterbags

Mar 7 (Thurs)
-Midterm

March 11-15: Spring break

Mar 19 (Tues)
-Small watershed approach data analysis exercise: bring laptops
-Weigh litterbags

Mar 21 (Thurs)
-P cycle
Reading: p. 287-290, 417-419 in Chapin, p. 396-401 in Schlesinger

Mar 26 (Tues)
-Stoichiometry
-In-class data analysis of preliminary data
Reading: Elser et al. 2000 Ecology Letters

Mar 28 (Thurs)
-Presentation of preliminary results from decomposition experiments
-Discussion: ecological stoichiometry, Schade et al.
Reading: Schade et al. 2003 Ecology Letters
-Weigh litterbags

Apr 2 (Tues)
-Disturbance & Succession
Reading: p. 339-367 in Chapin et al.

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

Apr 9 (Tues)
-Sustainability & Resilience
-Weigh litterbags

Apr 11 (Thurs)
-Ecosystem services
-Discussion: regime change, Scheffer et al.
Reading: p. 423-447 in Chapin et al., Scheffer et al. 2001

Apr 16 (Tues)
-Socio-ecological systems
-Discussion: ecosystem services, Foley et al.
Reading: Foley et al. 2005

Apr 18 (Thurs)
-Global change and ecosystem processes: temperature

Apr 23 (Tues)
-Global change and ecosystem processes: nutrient loading (dead zone)
-Final litterbag and soda lime weigh-in
-Discussion: nutrient loading; Schindler, Mulholland
Reading: Schindler 1974, Mulholland et al. 2008

Apr 25 (Thurs)
-Global change and ecosystem processes: CO_2 increase
-Statistical analysis of decomposition data

Apr 30 (Tues)
-Global change: interactive effects
-Discussion: ocean acidification, Hoegh-Guldberg et al.
Reading: Hoegh-Guldberg et al. 2007 Science

May 2 (Thurs)
-Decomposition presentation
-Recap and review

May 9: Final exam, 1-3 pm
-Decomposition lab report due