

Submit original with signatures + 1 copy + electronic copy to Faculty Senate (Box 7500). See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/> for a complete description of the rules governing curriculum & course changes.

TRIAL COURSE OR NEW COURSE PROPOSAL

SUBMITTED BY:

Department	Forest Sciences	College/School	SNRAS
Prepared by	J. Yarie	Phone	5650
Email Contact	jyarie@alaska.edu	Faculty Contact	

1. ACTION DESIRED (CHECK ONE): Trial Course New Course

2. COURSE IDENTIFICATION: Dept Course # No. of Credits

Justify upper/lower division status & number of credits: Graduate level - due to the background the student should have dealing with a number of various subjects like, terrestrial ecology, silviculture, landscape inventory techniques.

3. PROPOSED COURSE TITLE:

4. To be CROSS LISTED? YES/NO If yes, Dept: Course #

(Requires approval of both departments and deans involved. Add lines at end of form for additional required signatures.)

5. To be STACKED? YES/NO If yes, Dept: Course #

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.

6. FREQUENCY OF OFFERING:
Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) - or As Demand Warrants

7. SEMESTER & YEAR OF FIRST OFFERING (AY2013-14 if approved by 3/1/2013; otherwise AY2014-15)

8. 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. 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 6 weeks to full semester

OTHER FORMAT (specify)

Mode of delivery (specify lecture, field trips, labs, etc)

9. CONTACT HOURS PER WEEK:

3	LECTURE hours/weeks	<input type="checkbox"/>	LAB hours /week	<input type="checkbox"/>	PRACTICUM hours /week
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Note: # of credits are based on contact hours. 800 minutes of lecture=1 credit. 2400 minutes of lab in a science course=1 credit. 1600 minutes in non-science lab=1 credit. 2400-4800 minutes of practicum=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/guidelines-for-computing-/> for more information on number of credits.

OTHER HOURS (specify type)

10. COMPLETE CATALOG DESCRIPTION including dept., number, title, credits, credit distribution, cross-listings and/or stacking (50 words or less if possible):

Example of a complete description:

FISH F487 W, O Fisheries Management
3 Credits Offered Spring
Theory and practice of fisheries management, with an emphasis on strategies utilized for the management of freshwater and marine fisheries. Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; ENGL F414; FISH F425; or permission of instructor. Cross-listed with NRM F487. (3+0)

NRM F697 Terrestrial Carbon Management

3 Credits
Offered Spring

Climate change and its relationship to carbon dynamics have become elements of natural resource management options for land owners within the state and across the country and the globe. The course will present a broad scale description of the direction for forest carbon management and proposed methods for inventorying and documenting carbon dynamics attached to industry and down to the landowner. Prerequisites: BIOL F271 or NRM F375 or permission of instructor (3+0)

11. COURSE CLASSIFICATIONS: Undergraduate courses only. Consult with CLA Curriculum Council to apply S or H classification appropriately; otherwise leave fields blank.

H = Humanities S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core? If YES, attach form. YES: NO:

IF YES, check which core requirements it could be used to fulfill:
 O = Oral Intensive, Format 6
 W = Writing Intensive, Format 7
 Natural Science, Format 8

11.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 NO

12. COURSE REPEATABILITY:

Is this course repeatable for credit? YES NO

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?	<input style="width: 30px;" type="text"/>	TIMES
If the course can be repeated for credit, what is the maximum number of credit hours that may be earned for this course?	<input style="width: 30px;" type="text"/>	CREDITS
If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course?	<input style="width: 30px;" type="text"/>	CREDITS

13. **GRADING SYSTEM:** Specify only one. Note: Later changing the grading system for a course constitutes a Major Course Change.

LETTER: PASS/FAIL:

RESTRICTIONS ON ENROLLMENT (if any)

14. **PREREQUISITES** Biol F271 or NRM 375 or equivalent

These will be required before the student is allowed to enroll in the course.

Reference the registration implications below due to Banner coding of these terms:

Prerequisite: Course completed and grade of "C" (2.0) or higher prior to registering for the course that requires it.

Concurrent: Course may be taken simultaneously (and allows for a course to have been previously completed).

Co-requisite: Courses MUST be taken simultaneously and does NOT allow for fact that a course was previously completed!

15. **SPECIAL RESTRICTIONS, CONDITIONS**

16. **PROPOSED COURSE FEES** \$

Has a memo been submitted through your dean to the Provost for fee approval?

Yes/No

17. **PREVIOUS HISTORY**

Has the course been offered as special topics or trial course previously?

Yes/No

If yes, give semester, year, course #, etc.:

18. **ESTIMATED IMPACT**

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

19. **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

Yes

20. **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)

School of Natural Resources and Agricultural Sciences, Dept of Biology

21. **POSITIVE AND NEGATIVE IMPACTS**

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

This course will present in a comprehensive framework the necessary material for understanding the potential for the ecological and social implications of carbon management in the Alaskan environment. It will help land managers develop the procedures necessary for carbon accounting across a large landscape.

JUSTIFICATION FOR ACTION REQUESTED

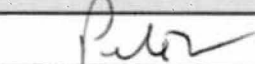
The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.

This course will be presenting up to date information on the developing scenarios and mandates that will be occurring in the next several years as the US starts to actually develop sound policies related to carbon sequestration and carbon trading dynamics. The potential place in the market for Alaska is currently unknown but we can not wait for the outside world to try and understand our environment and then develop policies that were totally tied to the lower 48. It is imperative that we start to develop knowledgeable resource managers that understand the environmental, social and political dynamics of the carbon sequestration playground.

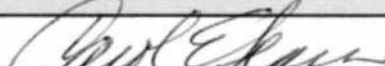
APPROVALS: Add additional signature lines as needed.

 Date 9/25/12

Signature, Chair, Program/Department of: Forest Science

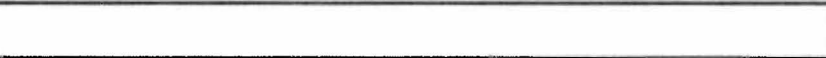

 Date 9/25/12

Signature, Chair, College/School Curriculum Council for: SNRAS

 Date 9-25-12

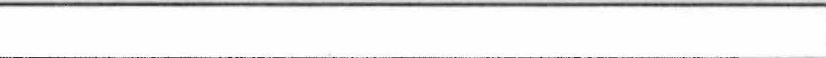
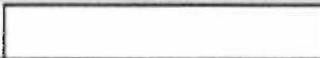
Signature, Dean, College/School of: SNRAS

Offerings above the level of approved programs must be approved in advance by the Provost.

 Date 

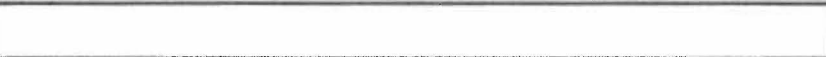
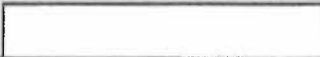
Signature of Provost (if above level of approved programs)

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

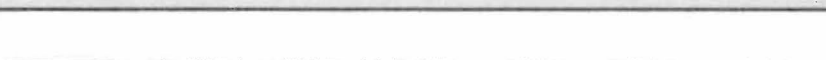
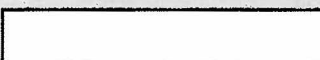
 Date 

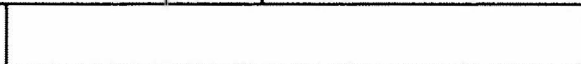
Signature, Chair Faculty Senate Review Committee: Curriculum Review GAAC Core Review SADAC

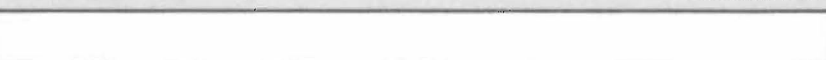
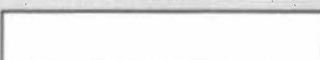
ADDITIONAL SIGNATURES: (As needed for cross-listing and/or stacking)


 Date 

Signature, Chair, Program/Department of: 

 Date 

Signature, Chair, College/School Curriculum Council for: 

 Date 

Signature, Dean, College/School of: 

ATTACH COMPLETE SYLLABUS (as part of this application). The guidelines are online: <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-uaf-syllabus-requirements/>
The Faculty Senate curriculum committees will review the syllabus to ensure that each of the items listed below are included. If items are missing or unclear, the proposed course (or changes to it) may be denied.

SYLLABUS CHECKLIST FOR ALL UAF COURSES

During the first week of class, instructors will distribute a course syllabus. Although modifications may be made throughout the semester, this document will contain the following information (as applicable to the discipline):

1. Course information:

Title, number, credits, prerequisites, location, meeting time
(make sure that contact hours are in line with credits).

2. Instructor (and if applicable, Teaching Assistant) information:

Name, office location, office hours, telephone, email address.

3. Course readings/materials:

Course textbook title, author, edition/publisher.
 Supplementary readings (indicate whether required or recommended) and
 any supplies required.

4. Course description:

Content of the course and how it fits into the broader curriculum;
 Expected proficiencies required to undertake the course, if applicable.
 Inclusion of catalog description is *strongly* recommended, and
 Description in syllabus must be consistent with catalog course description.

5. Course Goals (general), and (see #6)

6. Student Learning Outcomes (more specific)

7. Instructional methods:

Describe the teaching techniques (eg: lecture, case study, small group discussion, private instruction, studio instruction, values clarification, games, journal writing, use of Blackboard, audio/video conferencing, etc.).

8. Course calendar:

A schedule of class topics and assignments must be included. Be specific so that it is clear that the instructor has thought this through and will not be making it up on the fly (e.g. it is not adequate to say "lab". Instead, give each lab a title that describes its content). You may call the outline Tentative or Work in Progress to allow for modifications during the semester.

9. Course policies:

Specify course rules, including your policies on attendance, tardiness, class participation, make-up exams, and plagiarism/academic integrity.

10. Evaluation:

Specify how students will be evaluated, what factors will be included, their relative value, and how they will be tabulated into grades (on a curve, absolute scores, etc.) Publicize UAF regulations with regard to the grades of "C" and below as applicable to this course. (Not required in the syllabus, but may be a convenient way to publicize this.) Faculty Senate Meeting #171:
<http://www.uaf.edu/uafgov/faculty-senate/meetings/2010-2011-meetings/#171>

11. Support Services:

Describe the student support services such as tutoring (local and/or regional) appropriate for the course.

12. Disabilities Services: Note that the phone# and location have been **updated**.

The Office of Disability Services implements the Americans with Disabilities Act (ADA), and ensures that UAF students have equal access to the campus and course materials.

State that you will work with the Office of Disabilities Services (208 WHITAKER BLDG, 474-5655) to provide reasonable accommodation to students with disabilities.

NRM 660 – Terrestrial Carbon Management

Instructor - John Yarie

Lectures - MWF 9:15-10:15 (305 O'Neill Bldg)

Office Hrs - 337 O'Neill, 8A – 11A MTWT.

Telephone No. - 474-5650

Email - jyarie@alaska.edu

Textbook and additional reading material:

Wackernagel, Mathis and William Rees. 1996. Our Ecological Footprint. New Society Publishers, British Columbia, Canada. 160 pgs.

Walker, Brian and David Salt. 2006. Resilience thinking: sustaining Ecosystems and People in a Changing World. Island Press. Washington, D.C. 174 pgs.

Ravindranath, N. H. and Madelene Ostwald. 2008. Carbon Inventory Methods; Handbook for Greenhouse Gas Inventory, Carbon Mitigation and Roundwood Production Projects. Vol 29. Advances in Global Change Research. Springer. 304 pgs.

Hoover, Coeli M. (ed). 2008. Field Measurements for Forest Carbon Monitoring: A landscape-Scale Approach. Springer. 240 pgs.

Griffiths, Howard and Paul G. Jarvis. 2005. The Carbon balance of Forest Biomes. Taylor and Francis Group. New York, New York. 356 pgs

Course Description

Climate change and its relation to carbon dynamics have become an element of potential natural resource management options of land owners within the state and across the country and the globe. The course will present a broad scale description of the direction for forest carbon management and proposed methods for inventorying and documenting carbon dynamics attached to industry and down to the landowner.

Course Goals

This course focuses on environmental factors and ecological processes that drive forest carbon dynamics. Lectures will cover the basic concepts of forest carbon cycling and affects of silvicultural practices. Major areas of emphasis will be on: (a) establishment of a forest carbon site, (b) measurement of above- and below-ground pools, (c) measurement of above- and below-ground carbon fluxes, and (d) potential use of remote sensing and modeling techniques. Each lecture will have corresponding reading assignments that should be completed prior to the lecture. Class discussions on selected reading assignments will occur periodically. Students are responsible for all information covered in lectures, reading assignments, and discussions.

A planning exercise will be assigned as part of the course work and will be focused on development of a carbon monitoring system tied to a selected silvicultural prescription within the University Forest. Data analysis will be performed during the semester, concluding with the submission of a report by each student describing the proposed silvicultural practices for the University Forest and their potential affect on landscape carbon dynamics.

Student Learning Outcomes

Upon completion of this course students should be able to:

- 1) Develop an understanding of forest stand dynamics
- 2) Use the stand dynamics knowledge to devise carbon management objectives and activities to obtain a desired outcome
- 3) Understand natural and human caused abrupt and gradual changes that can occur in forest ecosystem carbon dynamics
- 4) Discuss the application of ecological knowledge to carbon management objectives of forest ecosystems

Instructional Methods

Presentation of material for this course will include lectures, instructor led discussions, student led discussions, and assignments. Students are expected to complete reading assignments prior to each lecture. Assigned homework is expected as scheduled on the course outline. Development of "Concept Maps" will be used throughout the course.

Course Calendar – Lecture Schedule

<u>Lecture #</u>	<u>Topic</u>	<u>Assignment</u>
1	Basic Course Introduction and Concept Map Presentation	
2	Global Carbon Cycle	Chapter 1, 2 & 3 – Carbon Inventory Methods;
3	Landscape Considerations	Chapter 1 – Field Measurements
4	Activities, Programs and Projects	Chapter 3 – Carbon Inventory Methods

Lecture #	Topic	Assignment
5	Project Development, etc.	Chapter 5 – Carbon Inventory Methods
6	Methodological Issues – Baseline, Permanence, Additionality and Leakage	Chapter 6 – Carbon Inventory Methods
7	Carbon Inventory Baseline and Project Directions	Chapter 7 – Carbon Inventory Methods
8	Project Areas and Boundary	Chapter 8 – Carbon Inventory Methods
9	Methods Overview	Preface – Field Measurements
10	Introduction to Class Project	
11	Carbon Pools and Measurement Frequency	Chapter 4 – Carbon Inventory Methods
12	Class project discussion	
13	First Exam	
14	Generic Methods of Inventory	Chapter 9 – Carbon Inventory Methods
15	Aboveground Biomass - Trees	Chapter 10 – Carbon Inventory Methods; Chapter 4 –Field Measurements
16	Discussion period	
17	Aboveground Biomass - Shrubs	Chapter 10 – Carbon Inventory Methods; Chapter 5 – Field Measurements
18	Belowground Biomass	Chapter 11 – Carbon Inventory Methods; Chapter 10 – Field Measurements
19	Discussion period	
20	Second Exam	
21	Deadwood and Litter	Chapter 11 – Carbon Inventory Methods; Chapters 6 & 7 – Field Measurements

<u>Lecture #</u>	<u>Topic</u>	<u>Assignment</u>
22	Soil Organic Carbon	Chapter 13 – Carbon Inventory Methods; Chapter 10 – Field Measurements
23	Discussion period	
24	Litter Decomposition	Chapter 8 – Field Measurements
25	Deadwood Decomposition	Chapter 9 – Field Measurements
26	Soil Respiration	Chapter 11 – Field Measurements
27	Dissolved Organic Carbon	Chapter 13 – Field Measurements
28	Methane Fluxes	Chapter 12 – Field Measurements
29	Discussion period	
30	Remote Sensing and GIS	Chapter 14 – Carbon Inventory Methods; Chapter 16 – Field Measurements
31	Modeling Carbon Dynamics – Online carbon balance software; COLE, COMET-VR, CENTURY	Chapter 15 – Carbon Inventory Methods
32	National Carbon Inventory	Chapter 16 – Carbon Inventory Methods
33	National Carbon Inventory	Chapter 16 – Carbon Inventory Methods
34	Carbon Stock Estimation and Changes	Chapter 17 – Carbon Inventory Methods
35	Discussion	
36	Uncertainty Estimation, Quality Assurance	Chapter 18 – Carbon Inventory Methods
37	Landscape-Scale Carbon Sampling	Chapter 17 Field Measurements
38	1605(b) guidelines	
39	Carbon Markets – Do we need	

<u>Lecture #</u>	<u>Topic</u>	<u>Assignment</u>
	financial or ecological expertise?	
40	Project Discussion	
41	Project Discussion	
42	Project Discussion	
Finals Week	Final Exam – Concept Map of all course material	

Course Policies

1. **Attendance**: As part of the “Learning Community” all students are expected to attend and participate in class.
2. **Absences and Make-ups**: If necessary, excused absences must be arranged ahead of time with the Instructor.
3. **Tardiness**: Students are expected to arrive in class prior to the start of each class. If a student does arrive late, they are expected to do so quietly.
4. **Participation and Preparation**: Students are expected to come to class with assigned reading and other assignments completed as noted in the Syllabus.
5. **Assignments**: All assignments must be received by the Instructor no later than 12 p.m. on the due date as noted in the Schedule unless otherwise prior-arranged. Each assignment must have the following: Your Name; Date; Assignment Title.
6. **Graded Assignments**: It is the instructor’s intention to grade and respond to student assignments within seven days of their receipt. At any time you may call and ask what you received on a specific assignment if you haven’t yet received it back.
7. **Reporting Grades**: All student grades, transcripts and tuition information are available on line at <http://www.uaonline.alaska.edu> and in the blackboard grades section. If you have difficulty accessing this web site, contact the registrar at your local campus.
8. **Written paper assignments**: All papers are expected to be typed and double spaced, with no misspelled words. Sentences should be grammatical and the paper easy to read. The burden is always on the writer to communicate with the reader. UAF has a writing lab and other tutoring services available to students (474-5314). It is also recommended that you have another person review your draft before final submission for a grade. Written assignments may be emailed or turned in during class to the instructor.
9. **Plagiarism**: Plagiarism is using what another person has written, and using it as your own words and thoughts. Plagiarism is never acceptable. According to the University, plagiarism is preventable by students “not representing the work of

others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses and other reports." The UAF Honor Code (Student Code of Conduct) defines the academic standards expected at UAF and is adhered to in this class as well.

10. All UA student academics and regulations are adhered to in this course. You may find these in UAF/UAS Catalogs.
11. **Confidentiality**: An important part of this course is the sharing of insights and experiences with other students. To benefit from this discussion, it is essential that we all maintain the confidentiality of children, families, programs and staff. We do not use names. We talk and write about children, families and staff in respectful ways.
12. **Incompletes, Withdrawal and No Basis Grading**: A student may request an Incomplete grade if there are factors beyond his/her control that effect the completion of the course AND the student has a C grade or higher at the end of the semester/course. A Faculty-Initiated Withdrawal is done by the instructor when the student has not met the criteria for passing the class, and is within the University-allowed drop period. A No Basis (NB) grade is provided if the student has not met attendance/assignment criteria, in lieu of a failing grade, provided it is after the University-allowed drop period. All are at the discretion of the Instructor.

Attendance

The student is responsible for all material distributed and presented in lectures and laboratory. Lecture attendance is important. Depending on the number of students, you will be part of a carbon dynamics working group and your lack of participation not only reflects upon you, but your entire group.

The student code of conduct can be found in the current UAF catalog and at the following website: <http://www.uaf.edu/catalog/current/academics/regs3.html>.

Grading

Your course grade consists of the following:

<i>Concept Map development</i>	55%
<i>Class presentation of carbon project</i>	15%
<i>Term Paper on carbon project</i>	30%
Total	100%

Letter grades for the course will be determined as follows and will reflect the Grading System and Grade Point Average Computation policy stated in the current UAF Catalog

A+100–97%	A96–93%	A-..... 92–90%
B+89–87%	B86–83%	B-..... 82–80%
C+.....79–77%	C.....76–73%	C- 72–70%
D+.....69–67%	D.....66–63%	D- 62–60%
	F.....less than 60%	

Student Support Services

The University has many student support programs. If you need assistance please contact any of the following service programs or departments. The instructor is available during posted office hours and upon appointment for additional assistance outside session hours.

Disabilities Services

The Forest Sciences Department will work with the Office of Disability Services to provide reasonable accommodation to students with disabilities. Disability Services provide a variety of services to assure equal access for all students. Interpreting services, educational assistants, note taking, and exam accommodations for students are the most frequently provided accommodations. Disability services also provides assistance to the university's rural campuses; Tanana Valley Campus, Bristol Bay, Chukchi, Interior-Aleutians, Kuskokwim, and Northwest.

The staff of Disability Services works with faculty in arranging appropriate services in the classroom. Questions should be directed to the Director of Disability Services at (907)-474-5655.

<http://www.uaf.edu/disability/>

UAF Office of Disability Services
612 N. Chandalar, PO Box 755590
University of Alaska Fairbanks
Fairbanks, Alaska 99775-5590

Phone: (907) 474-5655 | TTY: (907) 474-1827 | Fax: (907) 474-5688