REVISED FORMAT 1

FORMAT 1

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	**B&W**	**College/School**	**CNSM**
Prepared by	**Falk Huettmann**	**Phone**	**907 474 7882**
Email Contact	**fhuettmann@alaska.edu**	**Faculty Contact**	**Falk Huettmann PhD**

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

2. COURSE IDENTIFICATION:	Dept	**BIO/WLF**	Course #	**694**	No. of Credits	**3**

Justify upper/lower division status & number of credits:	

3. PROPOSED COURSE TITLE:	**Advanced Landscape Ecology**

4. To be CROSS LISTED? *YES/NO*	**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*	**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:	**Odd-numbered Years**
	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)	**AY2013-14**

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*	x	*6 weeks to full semester*

OTHER FORMAT (specify)	
Mode of delivery (specify lecture, field trips, labs, etc)	**Oral, lab and online**

9. CONTACT HOURS PER WEEK:	2	LECTURE hours/weeks	3	LAB hours /week		PRACTICUM hours /week

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)

Advanced Topics in Landscape Ecology
BIO/WLF 694 (Spring 2013~~; CRN 45261/46781~~)
The discipline of Landscape Ecology is now globally established and its essential role is widely acknowledged for human well-being. This course builds on digital and modeling opportunities in this discipline, including GIS, R, XML, data mining and machine learning. It follows a problem-based learning and critical thinking approach based on a balanced scientific debate and discussions. It is specifically designed to understand and apply advanced, quantitative Landscape Ecology topics (e.g. land-, seascape and sustainability).

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:**	**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	Yes	**NO**	

12. COURSE REPEATABILITY:

Is this course repeatable for credit?	**YES**		**NO**	**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?		**TIMES**
If the course can be repeated for credit, what is the maximum number of credit hours that may be earned for this course?		**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?		**CREDITS**

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

LETTER:	X	**PASS/FAIL:**	

RESTRICTIONS ON ENROLLMENT (if any)

14. PREREQUISITES	**Ecology 271, Landscape Ecology, and good standing (graduate student)**

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	**Students in good standing**

16. PROPOSED COURSE FEES	**None**
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**	**No**
If yes, give semester, year, course #, etc.:	

18. ESTIMATED IMPACT

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

Regular impacts that come with teaching a class related to natural resources: This course will require a computer lab, access to GIS etc software and will count towards my teaching load. This course might increase enrollment and some international recognition (e.g. within Arctic). Also, this course is likely attractive to students from SFOS, NRM and interdisciplinary studies for instance (but not cross-listed yet).

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	x	**Anne Christie, Bio Library**

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)

B&W, students from NRM, SFOS Interdisciplinary Programs have previously been very interested in such class offerings

21. POSITIVE AND NEGATIVE IMPACTS

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

This course extends our offerings for Landscape Ecology and for graduate student programs. It is meant to be multidisciplinary, apply to many projects and not have negative impacts.

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.

Arguably, Landscape Ecology makes for a key topic in Ecology, in Wildlife Biology, in Geography and in any Natural Resource Management; certainly for Alaska and its vast landscapes and wilderness. While there are several of such classes on the continent, there are only two of such offerings in the state of Alaska overall. As a long-time member of U.S. IALE, being a NASA-MSU awardee, and a co-author of a landscape ecology textbook, here I am offering an ADVANCED Landscape Ecology class. This class fills a critical gap for addressing quantitative and digital components in Landscape Ecology, and it offers students to obtain a unique skill set (digital GIS data sets, online data handling, modeling algorithms, software packages) that is highly seeked after by industry, NGO, agencies and in grad. schools. This class should become a flagship for UAF's class offerings on any landscape issues.

APPROVALS: Add additional signature lines as needed. SEE ATTACHED.

	Date	
Signature, Chair, Program/Department of:		

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

	Date	
Signature, Dean, College/School of:		

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:		

APPROVALS: Add additional signature lines as needed.

Signature, Chair, Program/Department of:	Biology & Wildlife	Date: April 4, 2012
Signature, Chair, College/School Curriculu Council for:	CNSM	Date: 4/20/12
Signature, Dean, College/School of:	CNSM	Date: April 23, 2012
Signature of Provost (if applicable)		Date:

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

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

Signature, Chair Faculty Senate Review Committee: ___Curriculum Review ___GAAC ___Core Review ___SADAC

Date:

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

Signature, Chair, Program/Department of:	Date:
Signature, Chair, College/School Curriculu Council for:	Date:
Signature, Dean, College/School of:	Date:

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.

Advanced Topics in Landscape Ecology
BIO/WLF 694 (Spring 2013)
(tentative, version 14th September 2012)

Instructor: Falk Huettmann **Office:** 419 IAB (Irving I)
Phone: 474 7882 (voice mail) **E-mail:** fhuettmann@alaska.edu
Office hours: Tuesdays 9:00 – 11:00 a.m. or by appointment

Lecture: Monday 13:00 –14:00 p.m., 208 Irving 1
Wednesday 13:00 –14:00 p.m., 208 Irving 1

Lab: Thursday 14:00 – 17:00 p.m., WRRB004

Course Web Page (Blackboard) http://courses.uaf.edu

Course Description: The discipline of Landscape Ecology is now globally established and its essential role is widely acknowledged for human well-being. This course builds on digital and modeling opportunities in this discipline, including GIS, R, XML, data mining and machine learning. It follows a problem-based learning and critical thinking approach based on a balanced scientific debate and discussions. It is specifically designed to understand and apply advanced, quantitative Landscape Ecology topics (e.g. land-, seascape and sustainability).

Course Goals: I this class, students will become fluent with the profession of Landscape Ecology and its modern tools, and obtain the required computational foundation for managing global landscapes while keeping all its components intact.

Learning Objectives/Outcome: Students will understand advanced principles of Landscape Ecology, and dealing with digital (meta) data, R, machine learning software, GIS & GPS applications.

Pre-requisites: BIOL 271 (Ecology), BIOL469O/669 (Landscape Ecology) or permission from the instructor (no GIS-, RS- or software-knowledge required). Good graduate student standing.

Credits: 3

Grading Policy: Letter grades will be determined from the performance in lectures (60%), labs (20%) and two oral presentations (20% A, B). Lecture performance will be determined from two exams (mid-term 20 % and final 30%), participation (10%), reading assignments (15%) and student-led discussions (25%). Labs require 4 lab assignments and one outdoors Landscape Ecology – Wildlife Habitat project assignment (20 % each). Missing classes and deadlines result into lost percentages (10% of the grade is usually lost for each day late) and potentially, class failure. Missed exams must be retaken immediately (date set by the lecturer) or result into 0%. For marking thresholds A = 100-91%, B = 90-81%, C = 80-71%, D = 70-61%, F < 61%. I do offer extra credit opportunities, e.g. for missed class work, and follow the latest UAF grading scheme.

Student-led Discussions and Reading Assignment: Each student will lead one app. 20 minute long discussion on a recent research topic relevant to Wildlife, Habitat and Landscape Ecology. Two research papers are to be made available on reserve or email by the student for the rest of the class to review one week prior to the discussion. The selected papers must be provided to the teacher two weeks prior to the course for information and assessment. The student in charge will lead the discussion by compiling a set of questions relevant to the topic and a list of questions (also distributed one week before class). Students will be expected to synthesize material from the readings in a biological science context, in addition to summarizing them. For the 'Reading Assignment', all students are required to provide a written one page review of the discussed paper annotated with scientific references following the Journal of Landscape Ecology.

Laboratory Assignments and Projects: Weekly 3 hour lab-projects are associated with this class in the UAF student computer labs. App. half of the labs deal with predictive modeling applications, powerful data mining algorithms (CARTs, TreeNet, RandomForest, ensembles) and software code. A project will cover two weekly labs. Labs are to be handed in bi-weekly and deal with specific topics covered in the lecture, e.g. software code, GIS (Geographic Information Systems), basic Remote Sensing and internet/www applications. The outdoors Landscape Ecology – Wildlife Habitat project assignment deals with a topic of choice defined by the student in agreement with the lectures and instructor. It must address a graduate level Landscape Ecology research topic, involve GPS and/or modeling. A selection of software code covered in this class include: ArcGIS, Geospatial Modeling Environment (GME; formerly Hawth's tools), R, Biomod, Salford Systems (Random Forests, Treenet, Mars etc), Fragstats, Patchanalyst, OpenGIS (Diva, QGIS), LANDIS, Open Office, SQL

Exams: A Mid-term and a Final Exam will be required. They consist of multiple choice and a few written questions, covering the content of the textbook as well as scientific concepts and software code learned during this course.

Readings: The course will closely follow the standard Landscape Modeling reference by:

Drew, Y. Wiersma and F. Huettmann (eds). Predictive Modeling in Landscape Ecology. Springer, New York.

Other research publications will be used as they apply and as required.

<u>Other details relevant for this class:</u>

STUDENTS WITH DISABILITIES: Students with learning or other disabilities who may need classroom accommodations are encouraged to make an appointment with the Office of Disability Services (907 474-5655). Please meet with me during office hours so that we can collaborate with the Office of Disability Services to provide the appropriate accommodations and supports to assist you in meeting the goals of the course.

PARTICIPATION: I expect students to participate and contribute actively in this class in order to improve the individual as well as the overall group performance. I allow NO cell phones during the entire course, nor non-course activities. This course includes R

code and software delivery, and students are expected to work on these subjects to completion and as long as required in order to complete the required tasks (help provided online, from books, by peers, and some support from the instructor via conversations during office hours).

ETHICS: I believe in team work, high ethical standards and fair judging. I will follow the Code of Honor outlined in the UAF documents. Plagiarism and any other unethical approaches will not be tolerated in this course and will result in failure of the class.

SUPPLIES REQUIRED: I expect students to have the text book. Field and outdoors gear, notebook, pen, computer (word processing, Open Office, printer) and internet access are also needed. A laptop is an asset (the UAF computing system is mainly used as a reference).

SUPPORT FOR WRITTEN TASKS: Since assignments are in a written format, students may want to make use of the Writing Center (8^{th} floor, Gruening Bldg). Digital assignments and deliveries are an important part of this class.

(I keep the right to modify the class schedules, whenever required by the course and circumstances)

Lecture Schedule BIOL/WLF 694

(version 2nd September 2012; tentative)

Date		General Topic *	Specific Topic
January	21	Introduction	Landscape Ecology Definition
	23	Introduction	Global Ecosystem Services
	28	Definitions and Terms	Landscape Metrics
	30	Analysis	Change Detection and Modeling
February	4	Modeling 1	On models and their value
	6	Guest Lecture	Guest Lecture
	11	Guest Lecture	Other Landscape Lectures and Syllabi
	13	Oral Requirements	20 min Student Presentations (A) and Review with Lecturer
	18	Quantitative Approaches 1	Landscape Sampling & Autocorrelation
	20	Remote Sensing	Remote Sensing
	25	Quantitative Tools	Landscape Ecology software models (LANDIS etc)
	27	Mid-term	Mid-term
March	4	SPRING BREAK	NO CLASS
	6	SPRING BREAK	NO CLASS
	11	Quantitative Tools	Climate Predictions, IPCC
	13	Quantitative Tools	Modeling the Future
	18	Quantitative Tools	Statistical Issues in Landscape Ecology
	20	Landscape Metrics 1	Data Mining
	25	Fragstats software	CARTs
	27	Landscape Metrics 2	TreeNet (Boosting)
April	1	Modeling 2	Random Forest (Bagging)
	3	IALE Conference	NO CLASS
	8	Oral Session	Students
	10	Quantitative Approaches 2	Scale in Landscape Ecology
	15	Quantitative Approaches 3	Computing, Sustainability & Predictions
	17	Oral Requirements	20 min Student Presentations (B) and Review with Lecturer
	22	Seascape Ecology	Seascape Ecology
	24	Landscape Ecology and Biogeography	Modeling Biogeography and DNA
	29	Applied Landscape Ecology , History of Landscape Ecology	Agriculture, Forestry, Urban, Fisheries, Roads, Tropics, 3 Polar Regions
May	6	Exam and Project prep.	Student & Project Discussion, Final Exam review

* weekly student-led discussions are integrated app. February onwards

Lab Assignments (tentative)

Submission Date		Topic
February	12	GIS, data and Fragstats
March	5	R-code of GIS CART, Boosting & Bagging
March	18	R-code for ensemble models
April	3	Spatial model assessment code (ROC etc)
May	5	Outdoor Project (Applied GIS or modeling)

Important Deadlines (tentative)

Date		Deliverable
3 weeks before		Discussion of topic with instructor
2 weeks before		Papers for discussion provided to instructor
1 week before		Questions for discussion provided to instructor
February	23	Oral presentation
February	27	Mid-Term
April	15	Start of Outdoors Lab Assignment
April	20	Oral presentation
May	6	Final Exam 1-3 PM