10-day

1 - Trial

GAMC

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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 [X] New Course [ ]

2. COURSE IDENTIFICATION: Dept: BIOL | Course #: F694 | 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 such signatures.)

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

6. FREQUENCY OF OFFERING: Spring, as demand warrants

Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) – or As Demand Warrants

7. SEMESTER & YEAR OF FIRST OFFERING (AY2011-12 if approved by 3/1/2012; otherwise AY2012-13): Spring 2013

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): 2 lectures + 3h lab

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

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Dean's Office
College of Natural Science & Mathematics

9. CONTACT HOURS PER WEEK: 2 LECTURE hours/weeks | 3 LAB hours /week | [ ] 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): NA

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

Advanced Topics in Landscape Ecology
BIOL 694

Governance
4/24/12 KQ

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 data mining and machine learning. It is a continuation of previous Landscape Ecology classes, and follows a problem-based learning and critical thinking approach based on a balanced scientific debate and discussions. Guest speakers are invited to that effect. It is specifically designed for graduate students to understand and apply advanced, quantitative Landscape Ecology topics (e.g., land-, seascape and sustainability). Two oral presentations are required, one on a type of software code, and a second on a scientific subject review, based on the latest high-quality scientific papers. In addition, each student will lead a class discussion, e.g., on an online data webpage (preferred) or textbook chapter. Students will learn how modern methods such as Geographic Information Systems (GIS), Machine Learning Software such as Random Forests and Treenet, Romote Sensing (RS), predictive modeling, R code, standalone models, XML metadata and the Internet/www can be used and applied to study and advance Landscape Ecology and Wildlife-Habitat for sustainable management of the earth in the context of climate change and impacts.

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**	[ ]

12. ***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 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***	Previous Landscape Ecology coursework OR permission from the instructor (no GIS-, RS-, or software knowledge required).

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

15. ***SPECIAL RESTRICTIONS, CONDITIONS***	**Student in good standing.**

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**	**No**

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

18. ESTIMATED IMPACT

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

No impact on budget, facilities/space.

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)

21. POSITIVE AND NEGATIVE IMPACTS

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

It may increase enrollment and international recognition.

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 sought after by industry, NGO, agencies and in graduate schools. This class should become a flagship for UAF's class offerings on any landscape issues.

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:

Advanced Topics in Landscape Ecology
BIOL/WLF 694 (Spring 2013)

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 data mining and machine learning. It is a continuation of previous Landscape Ecology classes, and follows a problem-based learning and critical thinking approach based on a balanced scientific debate and discussions. Guest speaker are invited to that effect. It is specifically designed for graduate students to understand and apply advanced, quantitative Landscape Ecology topics (e.g. land-, seascape and sustainability). Two oral presentations are required, one on a type of software code, and a second on a scientific subject review, based on the latest high-quality scientific papers. In addition, each student will lead a class discussion, e.g. on an online data webpage (preferred) or textbook chapter. Students will learn how modern methods such as Geographic Information Systems (GIS), Machine Learning Software such as Random Forests and Treenet, Remote Sensing (RS), predictive modeling, R code, stand alone models, XML metadata and the internet/www can be used and applied to study and advance Landscape Ecology and Wildlife-Habitat for sustainable management of the earth in the context of climate change and impacts.

Course Goals: Students will understand the core principles of Landscape Ecology, digital data, machine learning software, GIS & GPS applications and be capable of using their relevant details in Landscape Ecology applications. This course presents the required foundation for managing global issues while keeping components intact. This course is also designed to help students understand the relevant research disciplines and modern software topics related to the profession of a Landscape Ecologist.

Pre-requisites: Previous Landscape Ecology coursework OR permission from the instructor (no GIS-, RS-, or software knowledge required). Student in good 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). For marking thresholds A = 100-91%, B = 90-81%, C = 80-71%, D = 70-61%, F < 61%. I do offer extra credit opportunities, 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 details relevant for this class:

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 (7043). 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).

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.

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 any of the points outlined above, whenever required by the course and circumstances)

Lecture Schedule BIOL/WLF 692

(version 15th March 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 ensemble models I
March	18	R-code of ensemble models II
April	3	Model assessment code
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