FORMAT 2
Submit original with signatures + 3 copies

CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL

SUBMITTED BY:

Department	**Biology & Wildlife**	**College/School**	**Natural Sciences & Mathematics**
Prepared by	**Donald A. Walker**	**Phone**	**474-2460**
Email Contact	**dawalker@alaska.edu**	**Faculty Contact**	**same**

Received
MAY 25 2010
Dean's Office
College of Natural Science & Mathematics

1. *COURSE IDENTIFICATION:*

Dept	Course #	No. of Credits
BIOL	F475	3

COURSE TITLE Vegetation Description and Analysis

2. *ACTION DESIRED:*

Change Course [X] If Change, indicate below what change. Drop Course [ ]

NUMBER	X	**TITLE**		**DESCRIPTION**	X
PREQUISITES	X			***FREQUENCY OF OFFERING***	
CREDITS (including credit distribution)	X			***COURSE CLASSIFICATION***	
CROSS-LISTED	X	Dept.	NRM GEOG	(Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)	
STACKED (400/600)	X	Dept.	BIOL	Course #	F479/F679
OTHER (please 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. Furthermore, any core course compressed to less than six weeks must be approved by the core review committee.

COURSE FORMAT: (check one)		*1*		*2*		*3*		*4*		*5*	X *6 weeks to full semester*
OTHER FORMAT (specify)											
Mode of delivery (specify lecture, field trips, labs, etc)	**Lecture, field trips and labs**										

4. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found on Page 10 & 17 of the manual. If justification is needed, attach on separate sheet.)

H = Humanities [ ] N = Natural Science [ ] 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 [ ] W = Writing Intensive, Format 7 [ ] Natural Science, Format 8 [ ]

5. COURSE REPEATABILITY:

Is this course repeatable for credit? [ ] **YES** [X] **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 with variable credit, what is the maximum number of credit hours that may be earned for this course? [ ] **CREDITS**

6. *CURRENT CATALOG DESCRIPTION AS IT APPEARS IN THE CATALOG: including dept., number, title and credits*

BIOL F475 Vegetation Description and Analysis

2 Credits Offered Fall Even-numbered Years

Methods of vegetation science including sampling, classification, gradient analysis, ordination, field description and mapping. Field trips to the plant communities of interior Alaska. Special fees apply. Prerequisites: BIOL F474 or other general ecology course; permission of instructor. (1+3)

7. ***COMPLETE CATALOG DESCRIPTION AS IT WILL APPEAR WITH THESE CHANGES:*** ***(Underline new wording ~~strike through old wording~~ and use complete catalog format including dept., number, title, credits and cross-listed and stacked.) PLEASE SUBMIT NEW COURSE SYLLABUS. For stacked courses the syllabus must clearly indicate differences in required work and evaluation for students at different levels.***

BIOL ~~F475~~ F479 Vegetation Description and Analysis

~~2~~3 Credits Offered Fall Even-numbered Years

~~Methods of vegetation science including sampling, classification, gradient analysis, ordination, field description and mapping. Field trips to the plant communities of interior Alaska.~~ Concepts and methods of vegetation sampling, classification, analysis, and the relationship of species distributions to their environment. The course teaches students a comprehensive set of sampling and analysis methods used in vegetation science, providing them with practical skills applicable for research and management. Students collect, analyze and interpret vegetation data collected in the Fairbanks area. Special fees apply. Prerequisites: BIOL 239 and BIOL 271 ~~BIOL F474 or other general ecology course;~~ or permission of instructor. (Stacked with BIOL F679; GEOG F679; NRM F679.) (~~1~~2+3). (Cross-listed with GEOG F479; NRM F479).

8. ***IS THIS COURSE CURRENTLY CROSS-LISTED?***

YES/NO [NO] **If Yes, DEPT** [ ] **NUMBER** [ ]

(Requires written notification of each department and dean involved. Attach a copy of written notification.)

9. ***GRADING SYSTEM:***

LETTER: [X] **PASS/FAIL:** [ ]

10. ***ESTIMATED IMPACT***

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

None

11. ***LIBRARY COLLECTIONS***

Have you contacted the library collection development officer (jfklj@uaf.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]

Yes, this course was taught as proposed as a special topics course in Fall 2008, as BIOL F493/693. We used resources in the BioSciences Library, and some articles on e-reserve through Rasmuson Library.

12. ***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)

The Department of Resources Management and the Geography Department would be affected, as would the Department of Biology & Wildlife.

Joshua Greenberg, Chair of the Department of Resources Management, School of Natural Resources and Agricultural Sciences was supportive of the cross-listing, as was Stephen Sparrow, Associate Dean of Academics, School of Natural Resources and Agricultural Sciences (based on e-mail dated 18 October 2009).

Michael Sfraga, Chair of the Geography Department, School of Natural Resources and Agricultural Sciences was also supportive (based on e-mail dated 15 October 2009).

13. ***POSITIVE AND NEGATIVE IMPACTS***

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

Positive impacts: The cross-listing and stacking will allow graduate students in all three departments to get graduate credit for taking this course, teaching them practical skills to make them highly competitive for jobs with agencies and consulting firms.
Negative impacts: None.

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.

The proposed changes will improve the quality of UAF education, not lower it.

The course number is changed so that it has a number that is not already being used in all three departments (Biology & Wildlife, Natural Resource Management and Geography), at both the undergraduate and graduate level.

The prerequisites are changed to be more specific, and match BIOL 474.

The number of credits is changed from 2 to 3 because the course material takes a lot of time to cover. Students in previous years have noted that the course took too much time for 2 credits, and said that the amount of work was appropriate when the course was taught as a special topics course for 3 credits in Fall 2008. The change to 3 credits will make it more comparable with other courses.

The course is cross-listed with the Natural Resource Management and Geography Departments. This will make the course more attractive to students in those departments. The skills taught in this course are useful for anyone needing to collect or understand vegetation data, and are thus very applicable to majors in either Natural Resource Management or Geography as well as Biology & Wildlife students.

The course is stacked to make this course attractive to graduate students. Two of the 8 students taking this course when it was taught as a 3-credit special topics course in Fall 2008 were graduate students. The skills taught are directly useful for graduate research and are valuable skills for many agency and consulting firm jobs that graduate students are aiming for. Graduate students will be held to higher standards than undergraduates. The field methods notebooks for graduate students are expected to be better organized and more detailed than those of undergraduates. Graduate students' oral presentations are required to cover a broader topic and presented in more detail than undergraduates. For the final paper, graduate students are required to write a 15-20 page paper in scientific format (vs. 10 page for undergraduates), evaluating several different approaches to analyzing the data collected by the class (vs. one approach for undergraduates), or apply the methods to their own data set.

APPROVALS:

Richard D. Boone — Date 5/24/10

Signature, Chair, Program/Department of: Biology and Wildlife

Date 5/25/10

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

Paul W. Layer — Date 5/25/10

Signature, Dean, College/School of: Natural Sciences & Mathematics

Date

Signature of Provost (if applicable)

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.

Date

Signature, Chair, UAF Faculty Senate Curriculum Review Committee

ADDITIONAL SIGNATURES: ***(If required)***

	Date	20 May 2010
Signature, Chair, Program/Department of:	Geography	
	Date	20 May 2010
Signature, Chair, College/School Curriculum Council for:	Geography	
	Date	5-20-10
Signature, Chair, Program/Department of:	Natural Resource Management	
	Date	20 May 2010
Signature, Chair, College/School Curriculum Council for:	Natural Resource Management	
Associate Dean	Date	20 May 2010
Signature, Dean, College/School of:	Natural Resources and Agricultural Sciences	

Course Syllabus

1. Course Information

Title: Vegetation Description and Analysis
Course number: BIOL 479/679
Credits: 3 credit-hours, 2 lecture + 3 laboratory
Prerequisites: BIOL 239 Introduction to Plant Biology, or BIOL 271 Principles of Ecology, or permission of instructor
Location: lectures – Irving I; Field Trips – within 5 miles of campus; indoor laboratories – Irving I, Bunnel 301 and O'Neill.
Meeting Time: Fall Semester 2008; Lectures: Monday and Wednesday, 11:45 am -12:45 pm; Labs: Monday, 2:15 -5:15 pm

2. Instructor

The instructor for this course is **Donald (Skip) Walker**. He has done vegetation science for about 40 years, working in the Arctic of Alaska, Canada, and Russia, the alpine and grasslands of Colorado and Wyoming, the estuary and beach vegetation of the Straits of Magellan, Chili, and the alpine of the Garwahl Himalaya in India. He currently directs the Alaska Geobotany Center and is actively engaged in several research projects related to climate change in the Arctic and mapping the circum-boreal forest vegetation. His major areas of interest are methods of vegetation science, vegetation mapping, remote sensing, Arctic ecology, climate change, and disturbance and recovery of tundra vegetation.

Contact information:
Office hours: Monday, Wednesday 10 am-12 noon or by appointment.
Phones: Office - X2460, Home: 451-0800
Email: dawalker@alaska.edu

3. Course Readings/Materials

Required reading will include sections of books, relevant journal articles and reports to supplement the material covered in class. Additional materials are described so students can peruse and become familiar with the reference material available.

Those materials that are available electronically will be put on Blackboard or e-reserve. Books will be put on reserve in the Biosciences Library in the Arctic Health Building. This will include:

Kent, M. and P. Coker. 1996. *Vegetation description and analysis: a practical approach.* New York, John Wiley, 363 pp.

Mueller-Dombois, L. D. and Ellenberg, H., 1974: *Aims and Methods of Vegetation Ecology.* John Wiley and Sons, New York (reprinted in 2003 by Blackburn Press)

McCune, B. and Grace, J., 2002: *Analysis of ecological communities.* Gleneden Beach, Oregon: MjM Software Design, 300 pp.

Required supplies:
10x-power hand lens for field identification of plants
8.5 x 11 inch notebook for field reference collection and methods notes
Clothing adequate for spending several hours outdoors conducting field work (including day pack, rain gear (top & bottom), waterproof boots, coat/sweater, hat, gloves)

4. Course Description

Catalog description: Concepts and methods of vegetation sampling, classification, analysis, and the relationship of species distributions to their environment. The course teaches students a comprehensive set of sampling and analysis methods used in vegetation science, providing them with practical skills applicable for research and management. Students collect, analyze and interpret vegetation data collected in the Fairbanks area.

Content:
This course will give students a broad overview of concepts and methods of description and analysis of plant community data. These methods of vegetation science include vegetation sampling, classification, and gradient analysis, and exploration of the relationship of species distributions to their environment. Most of the class will be devoted to obtaining comprehensive skills for vegetation sampling and analysis. The first 4-6 labs will be in the field before the weather turns cold and snowy. The second part of the course will be in the herbarium, soils lab, and computer lab, where we will analyze the data collected from the field.

Students will collect a set of field data that they will use for analysis and production of an oral report and final written report that will be due at the end of the course. There are no exams. There are several graded exercises that are essential to understanding the material.

Expected proficiencies: Ability to read, comprehend, and assimilate written information in scientific texts and journals; basic math skills (including algebra); basic computer skills (including accessing the internet, word processing and spreadsheets); basic writing and presentation skills.

5. Course Goals and Learning Outcomes

The goals for the course are: (1) to provide students with a comprehensive set of sampling and analysis methods used in vegetation science, and (2) to develop an understanding and appreciation of vegetation, its composition, structure and function, its wide diversity, and role in local, regional and global ecosystems.

At the end of the course, students will be able to:

1) Design a sampling methodology to sample vegetation for specific purposes, including vegetation characterization and change analysis (disturbance or recovery).
2) Collect vegetation data in a range of ecosystems, from grasslands to shrubs to forest using a variety of appropriate instruments.

3) Analyze vegetation data for species composition, diversity, forest density and tree basal area.
4) Describe site environmental characteristics including a summary soil description.
5) Analyze soils for color, texture and pH.
6) Identify common boreal plants, including nonvascular plants
7) Analyze vegetation data using PC-ORD software to carry out ordinations, classification trees, and principal components analysis
8) The students will also have a comprehensive field methods notebook that they will have created during the course, to refer to when sampling and analyzing vegetation in the future.

6. Instructional Methods

Mondays will be devoted to lectures on practical methods and associated laboratories, which will be spread among the following activities: field sampling methods, 6 labs; herbarium and plant identification, 1 labs; soils, 1 lab; computer labs, 3 labs for ordination, 2 for classification; 1 lab for vegetation mapping. Wednesdays will be devoted to lectures and discussion of the theories behind sampling and vegetation analysis methods.

7. Course Calendar

Readings:

KC = Kent, M. and Coker, P., 1992: *Vegetation Description and Analysis: A Practical Approach.* New York: John Wiley and Sons.

MD&E = Mueller-Dombois, L. D. and Ellenberg, H., 1974: *Aims and Methods of Vegetation Ecology.* Boca Raton: CRC Press.

McC&G = McCune, B. and Grace, J., 2002: *Analysis of ecological communities.* Gleneden Beach, Oregon: MjM Software Design, 300 pp.

Date	Topics/Activities	Reading assignments	Assignments DUE
Lecture 1	**Introduction to vegetation sampling**		
Lecture 2 & Lab 1	***Field lab 1*** *Choosing sample sites, minimal area sampling.*	***Wear appropriate clothing for being outside for several hours. May require rain gear (jacket and pants), water-proof boots, coat, hat, gloves. Bring hand lens, notebook, pencil.***	***Be familiar with identification of common boreal plants***
Lecture 3	**Major considerations in vegetation sampling**	KC Chapter 1	

Lecture 4 & Lab 2	**11:45 - 12:00 lecture** ***1-5 pm Field lab 2*** *Frequency & cover in quadrats*	***Bring field gear as for Lab 1*** MD&E Chapter 6, pp. 67-80	**Minimal area lab report due**
Lecture 5	**Point sampling methods, density, frequency, cover, line transects, point quadrats, point frame**	**Paper #1** K&C Chapter 2	**Paper #1 summary due**
Lecture 6 & Lab 3	**11:45 - 12:00 lecture** ***1-5 pm Field lab 3*** *Frequency & cover using point and transect methods*	***Bring field gear as for Lab 1*** MD&E Chapter 6, pp. 80-92	**Quadrat frequency & cover lab report due**
Lecture 7	**Introduction to phytosociology approach**	**Paper #2** KC Chapter 7 MD&E Chapter 5	**Paper #2 summary due** *Initial notebook check*
Lecture 8 & Lab 4	**11:45 - 12:00 lecture** ***1-5 pm Field lab 4*** *Relevé sampling*	***Bring field gear as for Lab 1*** Westhoff & van der Maarle	**Diversity lab report due**
Lecture 9	**Diversity measures**	**Paper #3** KC Chapter 3 McC&G Chapters 2, 4	**Paper #3 summary due**
Lecture 10	**Forest sampling, plot-count methods and plotless sampling methods**	MD&E Chapter 7	**Data entry for relevés due**
Lab 5	***Field lab 5*** *Forest sampling methods*	***Bring field gear as for Lab 1 (but warmer!)***	
Lecture 11	**Descriptive statistics for vegetation data**	**Paper #4** KC Chapter 4	**Paper #4 summary due**
Lecture 12	**Site factors** **Soil sampling & description**	Barbour et al. Chapter 17 Harden paper	**Forest sampling lab report due**
Lab 6	***Field lab 6*** *Site factors and soils*	***Bring field gear as for Lab 1 (but warmer!)***	
Lecture 13	**Direct gradient analysis, weighted averaging**	**Paper #5** KC Chapter 5, pp. 162-169 McC&G Chapter 5, 18	**Paper #5 summary due** *Mid-term notebook check*
Lecture 14	**Flora of Alaska boreal forests and tundra, plant identification keys**		**Data entry – site factors for relevés due**
Lab 7	***Lab 7 - Herbarium: plant identification***		
Lecture 15	**Indirect ordination, polar ordination**	**Paper #6** KC Chapter 5, pp. 169-185 McC&G Chapters 13, 17	**Paper #6 summary due**

Lecture 16	**Soil description, analysis and classification**		**Gradient analysis lab report due**
Lab 8	***Lab 8 - Soils analyses: pH, grain size, soil color***		
Lecture 17	**Ordination: Principal components analysis**	**Paper #7** KC Chapter 5, pp. 186-214 McC&G Chapters 14	**Paper #7 summary due**
Lecture 18	**Introduction to PC-ORD**	PC-ORD booklet	**Data entry – soils data. Turn in complete data set for ordination.** *Topics for oral presentations approved*
Lab 9	***Lab 9 - Computer lab: Polar ordination and PCA***		
Lecture 19	**Ordination: correspondence analysis, detrended correspondence analysis, discriminant analysis**	**Paper #8** KC Chapter 6, pp. 215-226 McC&G Chapters 19, 20, 26	**Paper #8 summary due**
Lecture 20	**Bringing the environmental data into the ordination. Software for relevé data - TURBOVEG** *Student presentation #1*		
Lab 10	***Lab 10 - Computer lab: Ordinations with environmental data, DCA, CCA***		
Lecture 21	**Ordination: canonical correspondence analysis, nonmetric multi-dimensional scaling,** *Student presentation #2*	**Paper #9** KC Chapter 6, pp. 227-244 McC&G Chapters 16, 21	**Paper #9 summary due**
Lecture 22	**Numerical classification** *Student presentation #3*		**Ordination lab report due**
Lab 11	***Lab 11 - Computer lab: NMDS, cluster analysis,TWINSPAN***		
Lecture 23	**Table sorting methods and software TURBOVEG, JUICE** *Student presentation #4*	**Paper #10** KC Chapter 8 McC&G Chapters 10-12, 25	**Paper #10 summary due**
Lecture 24	**Review of ordination & classification methods** *Student presentation #5*	McC&G Chapter 22	*Topics for final paper approved*
Lab 12	***Lab 12 - Computer lab: Table sorting, analyses for final paper***		
Lecture 25	**Discussion of methods used in class papers and presentations**	**Paper #11**	**Classification & sorted table lab report due**

	Optional class		**Paper #11 summary due**
	THANKSGIVING BREAK		
Lecture 26	**Vegetation mapping** Student presentation		
Lab 13	***Lab 13 – Vegetation mapping: different imagery, scales, legends***		
Lecture 27	**Student presentations**	**Paper #12**	**Paper #12 summary due**
Lecture 28	**Student presentations**		**Notebooks due**
	No lab – time to work on papers		
Lecture 29	**Last lecture – Searching for the effects of climate change on Arctic vegetation**		**Paper due 15 Dec.**

8. Course Policies

Attendance & participation:
Students are expected to attend every class and lab, which will begin promptly. Absent or tardy students are responsible for making up missed content, and transporting themselves to field locations. Students are expected to participate in class discussions. Both attendance and participation will contribute to the final grade.

Reading assignments: There are reading assignments required to prepare students for each class. There are also journal papers to read for the course. Each paper will describe research using one or more of the techniques learned in class. Short answers to a few questions about the papers will be due each Wednesday. Additional reading that supplements the material covered in class will be assigned. This reading is recommended to broaden students' understanding of the topics and fill any gaps in students' background, and is required if a student is having difficulty understanding a topic.

Lab write-ups:
There will be 8 lab write-ups. These are designed to give the students an opportunity to apply analytical skills they have learned to data they have collected. These analyses will contribute to the oral and written presentations summarizing the data.

Vegetation Description & Analysis Notebook:
Each student will fill out a notebook defining, in his/her own words the methods covered in the class. The purpose of this assignment is for each student to finish the class with a methods book that he/she can refer to in the future. Students will be provided with an outline, and will fill the notebook with definitions, examples, references. The notebooks should be filled with whatever material the student finds most helpful. The notebook will be checked twice during the semester, and graded at the end.

Student oral presentations:

Each student will research and present some example of vegetation sampling and analysis, in a conference-style presentation, for about 15 minutes, with 5 minutes for questions. Topics are to be approved by the instructor. Undergraduate students are expected to select a relatively narrow topic, relying on three to five scientific references. Graduate students are expected to select a broader topic and explore it in more depth. Students will turn in a copy of their presentation (digital file or notes) for grading.

Final paper:
Each undergraduate student will choose one analytical approach, and write a 10-page paper describing the application of that approach to the data collected by the class. The paper can include many of the results developed as part of the class assignments. The paper will be in standard scientific format, with an abstract, introduction, methods, results, discussion, conclusion, acknowledgements and references, with a minimum of 10 peer-reviewed journal articles referenced. Graduate students will write a 15-20 page paper in scientific format, evaluating several different approaches to analyzing the data collected by the class, or apply the methods to their own data set.

Academic integrity:
Plagiarism and cheating will not be tolerated. Plagiarism is presenting another's work as new or original without citing your source. For additional detail, see
http://www.uaf.edu/library/instruction/handouts/Plagiarism.html
Please speak with me if you have any questions about how to properly use other people's work.

9. Evaluation

Grades:

Grades will be based on the following criteria:	Undergraduate	Graduate
Homework assignments (8 @ 40 pt each)	320	320
Journal article analysis (12 @15 points)	180	180
Vegetation description & analysis notebook	150	230
Oral presentation to class	80	100
Final paper	100	200
Class participation	70	70
TOTAL	900	1100

Note: These criteria may be modified somewhat as the course progresses. Final grades will be as follows: greater than or equal to 90% = A; 80-89% = B; 70-79% = C; 60-69% = D; < 60% = F.

Assignments are due at the beginning of class on the days shown in the syllabus. 5% of the total points will be deducted for every day an assignment is late.

10. Support Services

Students are encouraged to contact the instructor with any questions, or to clarify the lecture or the assignments. I will be happy to review drafts of assignments. .

Contact information:
Office: Arctic Health, Room 254
Office hours: Monday, Wednesday 10 am-12 noon or by appointment.
Phones: Office - X2460, Home: 451-0800
Email: dawalker@alaska.edu

11. Disabilities Services

The instructor will work with the Office of Disabilities Services (203 WHIT, 474 7043, to provide reasonable accommodation to students with disabilities. Any student needing special accommodation should talk with the instructor before the class or lab in question. These discussions will be held confidential.