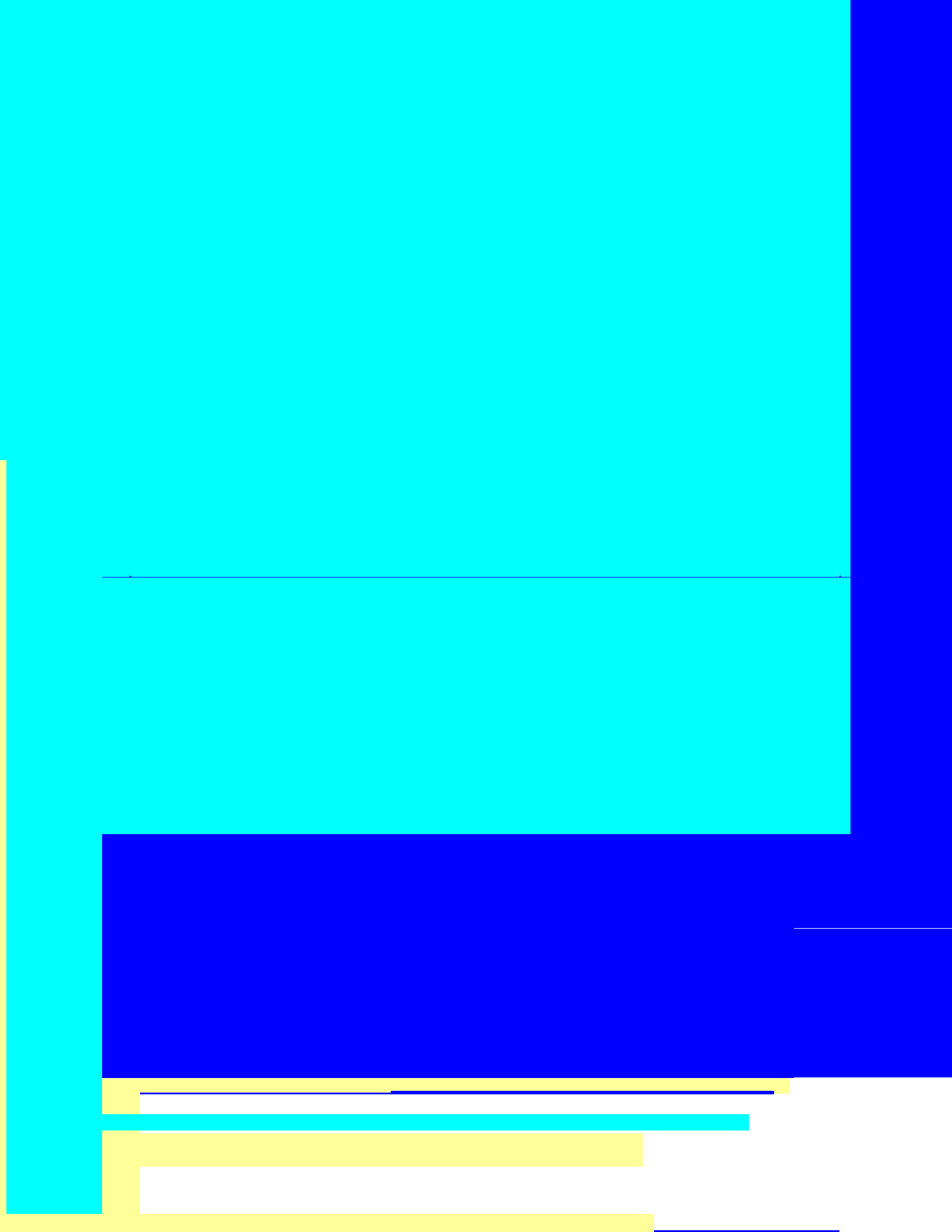
Submit originals and one copy and electronic copy to **Gov1 65.4 603.3 482.7 13.32 refBT/TT2 1 Tf10.02 0**

Current course number is F475. (Stacking is new.)



See attached signatures.

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

BIOL F4___ Vegetation Description and Analysis

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. Special fees apply. Prerequisites: BIOL 239 or BIOL 233 or BIOL 271, or BIOL 331 or permission of instructor. Stacked with BIOL F6__ (2+3)

Expected proficiencies for taking the course: Ability to read, comprehend, and assimilate written information in scientific texts and journals; basic math skills (including algebra); basic word processing and spreadsheets); basic writing and presentation skills, background in biology, ecology, and plants and/or other biological or Earth sciences such as geology, geomorphology, zoology, climatology and remote sensing.

More detailed description:
This course will give students a broad overview of concepts and methods of description and analysis of plant community data. These methods 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.

General course goals: The goals for the course are to provide students with a comprehensive set of sampling and analysis methods used in vegetation science.
Student outcomes: (1) Students should become proficient in a suite of field sampling techniques including the Braun-Blanquet relevé method, several point sampling methods, and the point-center quarter method, the methods of making a vegetation database and use of classification and ordination software (TurboVeg, JUICE and PC-Ord) and (2) to develop an understanding and appreciation of vegetation, its composition, structure and function, and diversity.

Lectures:
Mondays: Short lectures on practical methods will precede the Monday lab session. These lectures will cover field sampling methods, herbarium and plant identification, soils analysis, methods of ordination, vegetation classification, and vegetation mapping.

Wednesdays will be devoted to hour long lectures and discussion of the history, theory and approaches to sampling and vegetation analysis. Several of the Wednesday sessions will have Literature Discussion Sessions led by graduate students (see below), or student oral presentation (also see below).

Students are expected to attend the lectures and read the assigned literature. Students will need to read the assigned material to understand the methods covered in this course.

Labs:
Monday laboratories will be spread among the following activities: 6 labs for field sampling methods; 1 lab for herbarium and plant identification; 1 lab for soil analysis; 6 labs for vegetation analysis methods: 3 for ordination, 2 for classification, and 1 for vegetation mapping.

Lab write-ups:
There will be 5 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.

Literature discussion sessions led by graduate students:
Starting in October, students will read one outstanding paper per week that uses vegetation science methods. **An assigned graduate student will present a 20-minute summary of the paper to the class.** These presentations can include slides of key figures and major discussion points. Presenters are expected to bring other literature to bear on the topic, and discuss the relevance and significance of the paper. These overviews should focus on the principal points of the paper and major concepts, but also discuss methods that shed light on methods taught in the course. Students making the presentation will be graded on criteria that will be handed out early in the semester.

Following the presentation, the speaker will answer questions, followed by an open discussion. All students are expected to read the assigned paper and actively participate in the discussion. All students will be graded on their full participation in the presentations and discussions.

Vegetation Description & Analysis Notebook:
Each student will fill out a notebook defining, in his/her own words the methods covered in the class and observations made during the field co

Graduate students: Graduate students will choose 2-3 analytic approaches used in the class (or other approaches if appropriate) and apply them either to the North Campus Lands data or another appropriate data set, for example data for a thesis. These papers should present a thorough analysis of the data with considerable part of the paper devoted to background, questions, hypotheses and thorough description and analysis of the data; in other words the paper should synthesize material from a wide spectrum of the class analytical methods applied to either the vegetation of the UAF North Campus Lands, or a data set of the students choosing. The paper should be 2500-3500 words, in standard scientific format, with an abstract, introduction, methods, results, discussion, conclusions, acknowledgements and references, and figures and tables at the end of the paper, with a minimum of 15 peer-reviewed journal articles.

Final oral presentations:
Each student will present their final paper to the class in a conference-style oral presentation, for about 20 minutes for undergraduate students (30 minutes for graduate students), with 10 minutes for questions. Criteria for grading both the written and oral presentations that be handed out early in the semester.

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 (labs are highlighted in gray)	Reading assignments	Assignments DUE
Mon 8 Sept.	Introduction to vegetation sampling		
Mon 8 Sept.	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

Mon. 15 Sept.	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	Lab Report #1 due Minimal area sampling
	Point sampling methods, density, frequency, cover, line transects, point quadrats, point frame	K&C Chapter 2	

Mon. 20 Oct.	Flora of Alaska boreal forests and tundra, plant identification keys		
Mon. 20 Oct.	Lab 7 - Herbarium: plant identification		
Wed. 22 Oct.	1. Indirect ordination, polar ordination 2. Graduate student: Literature presentation #4	KC Chapter 5, pp. 169-185 McC&G Chapters 13, 17	
Mon. 27 Oct.	Soil description, analysis and classification		
Mon. 27 Oct.	Lab 8 - Soils analyses: pH, grain size, soil color		
Wed. 29 Oct.	1. Ordination: Principal components analysis 2. Graduate student: Literature presentation #5	KC Chapter 5, pp. 186-214 McC&G Chapters 14	
Mon. 3 Nov.	Introduction to PC-ORD	PC-ORD booklet	Data entry – soils data. Turn in complete data set for ordination. Topics for oral presentations approved
Mon. 3 Nov.	Lab 9 - Computer lab: Polar ordination and PCA		Data entry – site factors for relevés check
Wed. 5 Nov.	1. Ordination: correspondence analysis, detrended correspondence analysis, discriminant analysis 2. Graduate student: Literature presentation #6	KC Chapter 6, pp. 215-226 McC&G Chapters 19, 20, 26	
Mon. 10 Nov.	Bringing the environmental data into the ordination. Software for relevé data - TURBOVEG Student presentation #1		
Mon. 10 Nov.	Lab 10 - Computer lab: Ordinations with environmental data, DCA, CCA		
Wed. 12 Nov.	Ordination: canonical correspondence analysis, nonmetric multi-dimensional scaling, Student presentation #2	KC Chapter 6, pp. 227-244 McC&G Chapters 16, 21	
Mon. 17 Nov.	Numerical classification Student presentation #3		Lab Report #4 due Ordination
Mon.	Lab 11 - Computer lab: NMDS,		

17 Nov.	cluster analysis, TWINSPAN		
Wed. 19 Nov.	Table sorting methods and software TURBOVEG, JUICE Student presentation #4	KC Chapter 8 McC&G Chapters 10-12, 25	
Mon. 24 Nov.	Review of ordination & classification methods Student presentation #5		

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.

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 and answer questions any time. Arctic Health, Room 254. Phone 474-2460, dawalker@alaska.edu. Home phone: 451-0800.

The instructor will work with the Office of Disabilities Services (208 WHIT, 474-5655) 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.