

Submit originals and one copy and electronic copy to Governance/Faculty Senate Office  
See <http://www.uaf.edu/uafgov/faculty/cd> for a complete description of the rules governing curriculum & course changes.

### CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL

## SUBMITTED BY:

Department	Biology and Wildlife	College/School	CNSM
Prepared by	Donald A. Walker	Phone	X2460
Email Contact	dawalker@Alaska.edu	Faculty Contact	Donald A. Walker

## 1. COURSE IDENTIFICATION:

Course exists as BIOL F475 currently.

Dept	BIOL	Course #	F465/ 665X	No. of Credits	3
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COURSE TITLE	Vegetation Description and Analysis
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## 2. ACTION DESIRED:

Change Course	<input checked="" type="checkbox"/>	If Change, indicate below what change.	Drop Course	<input type="checkbox"/>
NUMBER	<input checked="" type="checkbox"/>	TITLE	DESCRIPTION	<input checked="" type="checkbox"/>
PREQUISITES	<input checked="" type="checkbox"/>	FREQUENCY OF OFFERING		
CREDITS (including credit distribution)	<input checked="" type="checkbox"/>	COURSE CLASSIFICATION		
CROSS-LISTED	<input type="checkbox"/>	Dept.	(Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)	
STACKED (400/600)	<input checked="" type="checkbox"/>	Dept.	BIOL	Course # 665
Include syllabi.				
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 all that apply) ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 6 weeks to full semester

OTHER FORMAT (specify all that apply)

Mode of delivery (specify lecture, field trips, labs, etc) Lecture, Field Trip, Labs

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

H = Humanities ☐S = Social Sciences ☐

Will this course be used to fulfill a requirement for the baccalaureate core?

YES ☐NO ☒

IF YES, check which core requirements it could be used to fulfill:

O = Oral Intensive, Format 6 also submitted ☐

W = Writing Intensive, Format 7 submitted ☐

Natural Science, Format 8 submitted ☐

## 5. 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?

0 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

RECEIVED

OCT - 5 2011

Dean's Office  
College of Natural Science & Mathematics

Governance

10/7/11 Ka

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.

4xx/6xx  
BIOL F465/665 Vegetation Description and Analysis

3 Credits Offered Fall Even-numbered Years

Methods of vegetation science including background lectures, field trips, and computer laboratories. Computer analysis includes database construction (Turboveg), table analysis (JUICE), and ordination (PC-Ord). Special fees apply. Prerequisites: BIOL 239 or BIOL 233 or BIOL 271, or BIOL 331 or permission of instructor. Stacked with BIOL F665 (2+3) 6xx

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: Specify only one

LETTER:

X

PASS/FAIL:

10. ESTIMATED IMPACT

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

Course will require a TA capable of helping with the field sampling exercises, soils labs, and especially with computer software and hardware in the computer lab.

11. 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

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 change to a stacked course should have a positive impact in that graduate students can now take the course for credit and this should also help with enrollment in the course.

13. POSITIVE AND NEGATIVE IMPACTS

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

### 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.**

a. The stacking will make this course attractive to graduate students. The course has a stronger emphasis on analysis than in the past, and uses state-of-the-art analytical software. Two of the 8 students taking this course time were graduate students and many of the students in past classes were graduate students as well as student government agencies. These students can use these skills in vegetation description and analysis whenever they to collect or understand vegetation data.

b. Increasing the course credits is needed because in the past students complained of the workload in comparison to the credit received when offered as a two-credit course. The additional lecture is needed to cover fully cover the material presented and allow for class discussion.


**A higher level of effort is expected of graduate students compared to undergraduates:**


a. Oral presentations: Graduate students are expected to select a broader topic and use a greater variety of scientific sources for their presentation (>10 sources for graduate students vs. 3-5 sources for undergraduates). Graduate students will have a total of 200 possible points for the oral presentation vs. 100 points for the undergraduate students.

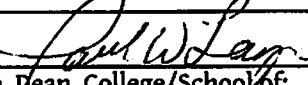
b. Final papers: Final papers will attempt to synthesize data analyzed in the class. Page limits for graduate students are greater (15-20 pages vs. 10 p. for undergraduates). Graduate students will also be expected to use information from several different vegetation analytical approaches or apply the approaches to their own datasets, whereas the undergraduates will focus on a single analytical approach using the class data. Graduate students will have a total of 200 possible points for the final paper vs. 100 points for the undergraduate students.

c. Journal article discussions: The graduate students will be expected to lead the discussions for the journal articles (with help and guidance from the instructor). Graduate students will receive a total of 20 possible points for each discussion (10 papers for 200 possible points vs. 10 points each (100 total) for undergraduate students.

### APPROVALS:

Signature, Chair, Program/Department of:  Date: Oct 3, 2011

Signature, Chair, College/School Curriculum Council for:  Date: 10/4/11  
CNSM

Signature, Dean, College/School of:  Date: Oct 5, 2011  
CNSM

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, UAF Faculty Senate Curriculum Review Committee: \_\_\_\_\_ Date: \_\_\_\_\_

**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:		

NOTE: Course currently exists as BIOL F475. Numbering to be determined.

## **Preliminary Syllabus for MAJOR COURSE CHANGE, BIOL ~~465~~/ ~~665~~; Vegetations Description and Analysis, Fall 2012**

### **1. Course Information**

**Title:** Vegetation Description and Analysis

**Course number:** BIOL ~~465~~/~~665~~ numbers to be determined.

**Credits:** 3 credit-hours, 2 lecture + 3 laboratory

**Prerequisites** BIOL 115, BIOL 116; BIOL 239 Introduction to Plant Biology, or BIOL 271 Principles of Ecology, or BIOL 331 Plant Systematics, or permission of instructor

**Location:** lectures – Irving, Room TBA I; Field Trips – mostly within Arboretum and Murphy Dome; Indoor laboratories – Irving I, Bunnell and O'Neill.

**Meeting Time:** TBA

### **2. Instructor**

**Prof. Skip Walker**, Arctic Health, Room 254. Phone 474-2460, dawalker@alaska.edu. Home phone: 451-0800.

### **3. Course Readings/Materials**

The only required reading material is a set of journal articles that will be available on Blackboard. Recommended reading will include sections of books, relevant journal articles and reports to supplement the material covered in class. 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. Some materials are included 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.

Tichý L and Holt J 2011 JUICE program for management, analysis and classification of ecological data, 2nd Edition of Program Manual (Brno: Vegetation Science Group, Masaryk University)

#### **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:**

BIOL F465 Vegetation Description and Analysis

3 Credits      Offered Fall Even-numbered Years

Methods of vegetation science including background lectures, field trips, and computer laboratories. Computer analysis includes database construction (Turboveg), table analysis (JUICE), and ordination (PC-Ord). Special fees apply. Prerequisites: BIOL 239 or BIOL 233 or BIOL 271, or BIOL 331 or permission of instructor. Stacked with BIOL F665 (2+3)

**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**

**General:** 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 (JUICE and PC-Ord) 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.

**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 lab; 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.

<b>Date</b>	<b>Topics/Activities</b>	<b>Reading assignments (required in bold)</b>	<b>Assignments DUE</b>
Mon 8 Sept.	<b>Introduction to vegetation sampling</b>		
Mon 8 Sept.	<b>Field lab 1</b> <i>Choosing sample sites, minimal area sampling.</i>	<i>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.</i>	<i>Be familiar with identification of common boreal plants</i>
Wed 10 Sept.	<b>Major considerations in vegetation sampling</b>	KC Chapter 1	
Mon. 15 Sept.	11:45 - 12:00 lecture 1-5 pm <b>Field lab 2</b> <i>Frequency &amp; cover in quadrats</i>	<i>Bring field gear as for Lab 1</i> MD&E Chapter 6, pp. 67-80	<i>Lab Report #1 due</i> <i>Minimal area sampling</i>
Wed. 17 Sept.	<b>Point sampling methods, density, frequency, cover, line transects, point quadrats, point frame</b>	<b>Paper #1</b> K&C Chapter 2	<b>Paper #1 summary due</b>
Mon. 22 Sept.	11:45 - 12:00 lecture 1-5 pm <b>Field lab 3</b> <i>Frequency &amp; cover using point and transect methods</i>	<i>Bring field gear as for Lab 1</i> MD&E Chapter 6, pp. 80-92	<i>Lab Report #2 due</i> <i>Calculating frequency from point data</i>
Wed. 24 Sept.	<b>Introduction to phytosociology approach</b>	<b>Paper #2</b> KC Chapter 7 MD&E Chapter 5	<b>Paper #2 summary due</b> <i>Initial notebook check</i>
Mon. 29 Sept.	11:45 - 12:00 lecture 1-5 pm <b>Field lab 4</b> <i>Relevé sampling</i>	<i>Bring field gear as for Lab 1</i> Westhoff & van der Maarel	
Wed. 1 Oct.	<b>Diversity measures</b>	<b>Paper #3</b> KC Chapter 3 McC&G Chapters 2, 4	<b>Paper #3 summary due</b>
Mon. 6 Oct.	<b>Forest sampling, plot-count methods and plotless sampling methods</b>	MD&E Chapter 7	<b>Data entry for relevés due</b>

Mon. 6 Oct.	<b>Field lab 5</b> <i>Forest sampling methods</i>	<b>Bring field gear as for Lab 1</b> <i>(but warmer!)</i>	
Wed. 8 Oct.	<b>Descriptive statistics for vegetation data</b>	<b>Paper #4</b>  KC Chapter 4	<b>Paper #4 summary due</b>
Mon. 13 Oct.	<b>Site factors</b> <b>Soil sampling &amp; description</b>	Barbour et al. Chapter 17 Harden paper	
Mon. 13 Oct.	<b>Lab 6: Species relevé data entry</b>		<b>Lab report #3 due</b> <i>Calculating forest structure data from point-centered-quarter data</i>
Wed. 15 Oct.	<b>Direct gradient analysis, weighted averaging</b>	<b>Paper #5</b> KC Chapter 5, pp. 162-169 McC&G Chapter 5, 18	<b>1. Paper #5 summary due</b> <b>2. Mid-term notebook check</b>
Mon. 20 Oct.	<b>Flora of Alaska boreal forests and tundra, plant identification keys</b>		
Mon. 20 Oct.	<b>Lab 7 - Herbarium: plant identification</b>		
Wed. 22 Oct.	<b>Indirect ordination, polar ordination</b>	<b>Paper #6</b> KC Chapter 5, pp. 169-185 McC&G Chapters 13, 17	<b>Paper #6 summary due</b>
Mon. 27 Oct.	<b>Soil description, analysis and classification</b>		
Mon. 27 Oct.	<b>Lab 8 - Soils analyses: pH, grain size, soil color</b>		
Wed. 29 Oct.	<b>Ordination: Principal components analysis</b>	<b>Paper #7</b> KC Chapter 5, pp. 186-214 McC&G Chapters 14	<b>Paper #7 summary due</b>
Mon. 3 Nov.	<b>Introduction to PC-ORD</b>	PC-ORD booklet	<b>Data entry – soils data. Turn in complete data set for ordination. Topics for oral presentations approved</b>
Mon. 3 Nov.	<b>Lab 9 - Computer lab: Polar ordination and PCA</b>		<b>Data entry – site factors for relevés check</b>
Wed. 5 Nov.	<b>Ordination: correspondence analysis, detrended correspondence analysis, discriminant analysis</b>	<b>Paper #8</b>  KC Chapter 6, pp. 215-226 McC&G Chapters 19, 20, 26	<b>Paper #8 summary due</b>
Mon. 10 Nov.	<b>Bringing the environmental data into the ordination. Software for</b>		

	<b>relevé data - TURBOVEG</b> <i>Student presentation #1</i>		
Mon. 10 Nov.	<b>Lab 10 - Computer lab:</b> <i>Ordinations with environmental data, DCA, CCA</i>		
Wed. 12 Nov.	<b>Ordination: canonical correspondence analysis, nonmetric multi-dimensional scaling,</b> <i>Student presentation #2</i>	<b>Paper #9</b>  KC Chapter 6, pp. 227-244 McC&G Chapters 16, 21	<b>Paper #9 summary due</b>
Mon. 17 Nov.	<b>Numerical classification</b> <i>Student presentation #3</i>		<b>Lab Report #4 due</b> <b>Ordination</b>
Mon. 17 Nov.	<b>Lab 11 - Computer lab: NMDS, cluster analysis, TWINSpan</b>		
Wed. 19 Nov.	<b>Table sorting methods and software TURBOVEG, JUICE</b> <i>Student presentation #4</i>	<b>Paper #10</b> KC Chapter 8 McC&G Chapters 10-12, 25	<b>Paper #10 summary due</b>
Mon. 24 Nov.	<b>Review of ordination &amp; classification methods</b> <i>Student presentation #5</i>	McC&G Chapter 22	<i>Topics for final paper approved</i>
Mon. 24 Nov.	<b>Lab 12 - Computer lab: Table sorting, analyses for final paper</b>		
Wed. 26 Nov.	<b>Discussion of methods used in class papers and presentations</b> <i>Optional class</i>	<b>Paper #11</b>	<b>Lab Report #5 due</b> <b>Sorted Table analysis</b>
27-30 Nov.	<b>THANKSGIVING BREAK</b>		
Mon. 1 Dec.	<i>Student presentation #6, 7</i>		
Mon. 1 Dec.	<b>Lab 13 – Vegetation mapping: different imagery, scales, legends</b>		
Wed. 3 Dec.	<b>Student presentations #8-9</b>	<b>Paper #12</b>	
Mon. 8 Dec.	<b>Oral presentations #10-11</b>		<b>Notebooks due</b>
Mon. 8 Dec.	<b>No lab. Work on papers</b>		
Wed. 10 Dec.	<b>Last lecture – Searching for the effects of climate change on Arctic vegetation</b>		<b>Final paper due 15 Dec.</b>

## 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 will be 10 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. Graduate students will lead class discussions of the paper and will be expected to participate more actively in the discussion.

**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
Lab report assignments (5 @ 20 pt each)	100	100
Journal article analysis (10)	100	200
Vegetation description & analysis notebook	150	150
Oral presentation to class	100	200
Final paper	100	200
Class participation	50	50
TOTAL	600	900

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**

### **Office hours and contact:**

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.

## **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.