



## Botany 4600 Plant Ecology (Spring 2014)

### I. General Information

Professor: Dr. Michael Fleming  
Office: N 261  
Office Hours: Wednesdays 11-12, Thursdays 2:30-3:30, or by appointment  
Phone: 664-6923  
Email: m Fleming1@csustan.edu  
Lectures: MWF 1:00–1:50 in Bizzini 103 (aka C-103)  
Lab: M 2:00–4:50 in Naraghi 211  
Required Text: *The Ecology of Plants, 2nd ed.* by J. Gurevitch *et al.*

*Announcements.* Check BlackBoard for updates, lecture slides, study guides, etc.

*Course Objectives.* After completing this course you should be able to (1) demonstrate your ability to think like an ecologist, (2) speak & write coherently about ecology with biologists and non-biologists alike, (3) apply ecological knowledge to make informed decisions in your life.

*My Teaching Philosophy.* I will work hard and use multiple ways of learning to help you succeed in this course. Hopefully we'll also have a few laughs as we go along.

*Class Participation.* Please arrive to class on time and ready to learn. Assignments are due at the start of class (or on your way out if we did it in class). You will talk and work frequently in small groups, and sometimes present your ideas to the entire class. Most importantly, please do not disrupt the learning environment, rights, and property of others. Of course, all gadgets not conducive to learning in the course, such as cell phones/iPods/etc. should be turned off during class. Be honest, hold yourself accountable for your actions, and hold me accountable for mine.

*Evolution.* "Respect for data, comfort in faith." Someone much wiser than me came up with this saying. If you can live by it then you'll be fine in this class. Evolution and natural selection are central tenets of biology and will be critical aspects of this course, openly discussed and referred to frequently.

*Math.* Every ecologist uses math and statistics. In this course you will use math as it applies to ecology. This will include making and interpreting graphs, calculating averages and variation around an average, using t-tests, ANOVA, linear regression and ordination. I will help you and there will be chances to practice. NOTE: a laptop computer and/or scientific calculator is a very good tool for this class.

### II. Course Description

Plant ecology is the study of the interrelationships between plants and their environments, with special emphasis on the structure, development, distribution and measurement of plant communities. This course satisfies the ecology elective for the biology major. Most of our focus will be on wild plant communities, but for the agriculture students in the class, we will also cover some material dealing with ecology of agricultural systems. **Prerequisites:** BIOL 1150, CHEM 1110, or equivalent. **Strongly recommended:** one semester of statistics (MATH 1600, 1610 or 4640).

### III. Assignments, Exams and Grading

*Exams.* We will have two midterms and one comprehensive final exam. Exams will consist of diagram interpretation and open response questions. Please plan ahead and arrive early on exam days. Requests for early or make-up exams must be submitted in writing prior to the scheduled exam. You will need to provide some evidence of hardship. No makeup exams will be given after graded exams have been returned to the class.

*Primary Literature.* Throughout the semester we will have in-class group discussions stemming from readings from primary literature. Some readings and subsequent discussions will require more work than others (depends on the length and rigor of the paper). No opportunities for makeup discussions will be given, but if you miss one I encourage you to talk about the paper with a friend or with me outside of class. These readings/discussions are designed to provide opportunities for you to explore plant ecology research, discuss complicated concepts and terminology, and teach each other.

*Labs.* The laboratory and lecture are generally integrated, and each lab period will have a special emphasis that (hopefully!) further illustrates concepts introduced in lecture. Labs will often NOT have an accompanying lab report; rather, lab grades are based on (1) participation and (2) the term project that you and your team design, implement, analyze, write up and report to the rest of the class. Any take-home work stemming from a lab constitutes "participation" and will be due the next week at the beginning of lab. You can only get credit for a lab if you are present in lab—there are no make-up labs. Lab activities will include, but are not limited to, greenhouse and bio-ag area work, plant identification, statistical methods relevant to analyzing plant community data, and field trips.

*Grades.* There are 570 points possible in this course distributed as follows:

MIDTERM EXAMS (100 x 2 exams)	= 200 pts.
FINAL EXAM	= 150 pts.
PRIMARY LITERATURE DISCUSSION (10 pts. x 5 weeks)	= 50 pts.
LAB TERM PROJECT (30 pts. presentation, 70 pts. paper)	= 100 pts.
<u>LAB PARTICIPATION (5pts. weekly)</u>	<u>= 70 pts.</u>
<b>TOTAL</b>	<b>= 570 pts.</b>

I calculate grades as a function of grade point average (GPA) where A=4.0 and D=1.0 (I will show you an example of this in class). Students find this method fair and equitable. **I give + and – grades** as follows:

4.0-3.8 = A	3.7-3.6 = A-	3.5-3.3 = B+	3.2-3.0 = B	2.9-2.6 = B-	2.5-2.3 = C+
2.2-2.0 = C	1.9-1.6 = C-	1.5-1.3 = D+	1.2-1.0 = D	0.9-below = F	
CR = 1.6 or higher		NC = 1.5 or lower			

*Important Dates.* The last day to add the class is Feb. 7<sup>th</sup>. Census Date is Feb. 21<sup>st</sup>. This is the last day to drop the course or change your grading option without my signature; it is your responsibility to submit the grade change form to Admissions and Records by 5pm that day. Mar. 17<sup>th</sup> is the last day to change your grading option with my signature. I strictly adhere to the grading option Academic Records has on file for you when I submit final grades. I will not change grades once final grades have been submitted.

*Extra Credit.* I do not plan to offer extra credit. If I do come up with a great idea for extra credit, I will let you know, but often it means more work for both you and me (not an attractive option). The best thing to do is do well in class, study effectively, and get help when you need it.

*Recording Lectures and Special Accommodations.* This course is ADA accessible. Students with documented disabilities should seek special accommodations for all classes through the Disability Resource Services office on campus. If DRS notifies me that you require ADA accommodations, then I will provide them for you, such as

permission to record lectures. Otherwise, you have to do it the old-fashioned way with pen and paper. If you record my class in any form (video, audio, still pictures, etc.) without accommodation from DRS, that constitutes intellectual property theft and will be a bad situation for all involved. Student athletes who will miss class for games/matches should have their coach contact me, and I will accommodate your schedule by allowing alternate test dates and/or excusing points missed in class.

#### **IV. Field Trip**

We will be in the field during the semester, mostly around campus during lab. One significant part of the class is our field trip to Red Hills, a serpentine soil site with many endemic plants, where we will survey plant communities there and use those data (and prior class data from the same site) to explore a plant ecology question and write a formal scientific paper. For the Red Hills trip, we will meet in the parking lot at Red Hills. I will provide you with a plant list and directions to the site. More details provided in class.

#### **V. Academic Honesty**

Academic honesty is essential for effective teaching and learning. I expect students to have the highest standards of academic honesty, and I won't tolerate cheating in any form. Any academic dishonesty will result in an F in the class and the matter will be turned over to the appropriate student disciplinary committee.

#### **VI. Study Skills**

The following suggestions may help you succeed in this and other classes. 1. **Read** the chapter(s)/papers before class and bring questions you have to class. 2. **Attend** class. 3. **Complete all assignments** and turn them in on time. 4. **Take notes** in a way that is intuitive to you, even if you have to use a lot of paper. 5. **Join a study group** with like-minded individuals. 6. **Study** for the exams sooner than the night before or morning of the exam. 7. **Go to bed early** the night before and get up early the day of exams. 8. **Learn how you learn** and then stick with a style or process that is successful for you.

Learning takes time and is difficult (impossible?) to do in a single session before an exam. Form a study group that meets regularly so you can talk about new concepts and review terminology with your colleagues. When studying for exams, focus primarily on lecture/lab notes and concepts emphasized in in-class and lab activities. Students who study in groups tend to do better than those that study alone.

#### **VII. Graduate Students**

If you are taking this course as a graduate student, then extra work is required. Please set up a time to talk to me about additional graduate-level work.

### VIII. Tentative Schedule (subject to change)

<i>Week (Monday date)</i>	<i>Lecture Topic(s)</i>	<i>Readings</i>	<i>Lab</i>
1 (Jan. 27)	Introduction The Community Concept	Ch. 1 Ch. 9 (pp. 205-212)	Greenhouse → set up competition experiment
2 (Feb. 3)	Environmental Gradients Climate	Ch. 2, 3, 4 (skim these) Ch. 17	Finish competition set up Campus Plant walk, ID plants
3 (Feb. 10)	Biomes Indicator Species Concept	Ch. 18 Ch. 7, 8	Theory and Practice of sampling communities
4 (Feb. 17)	Nature of Populations	Ch. 5, 6	Statistical Methods 1 – the basics (mean, SD, types of graphs, t-tests, ANOVAs)
5 (Feb. 24)	Competition Herbivory <b>EXAM 1 FRIDAY Feb. 28</b>	Ch. 10 Ch. 11	Statistical Methods 2 – Regression Analysis
6 (Mar. 3)	Nature of Communities Ordination Methods 1	Ch. 9 (pp. 212-end), 15	Team formation, Statistical Methods 3 – Indirect Ordination
7 (Mar. 10)	Ordination Methods 2	Ch. 15	Statistical Methods 4 – Direct Ordination
8 (Mar. 17)	Succession	Ch. 12	Process plants/data from competition experiment
9 (Mar. 24)	Landscape Ecology	Ch. 16	Process plants/data from competition experiment
10 (Mar. 31)	Lessons From Succession	Ch. 12, 13	<b>RED HILLS TRIP MON. 3/31</b> Process soil from FT, begin entering/formatting data
11 (Apr. 7)	Restoration Ecology <b>EXAM 2 FRIDAY Apr. 11</b>	Ch. 12, 8	Work on reports
12 (Apr. 14)	Plants and People	Ch. 21	Work on reports
13 (Apr. 21)	<i>Spring Break ☺</i>	<i>No Classes!</i>	<i>Do something fun</i>
14 (Apr. 28)	Global Climate Change	Ch. 21, 19	Work on reports
15 (May 5)	Extinction Good News For a Change!	Ch. 19, 16 (last section) Ch. 13	Reports
16 (May 12)	Summing Up		Reports
17 (FRIDAY, May 23)	<b>FINAL EXAM = FRI. MAY 23<sup>rd</sup>, 11:15 - 1:15</b>		