

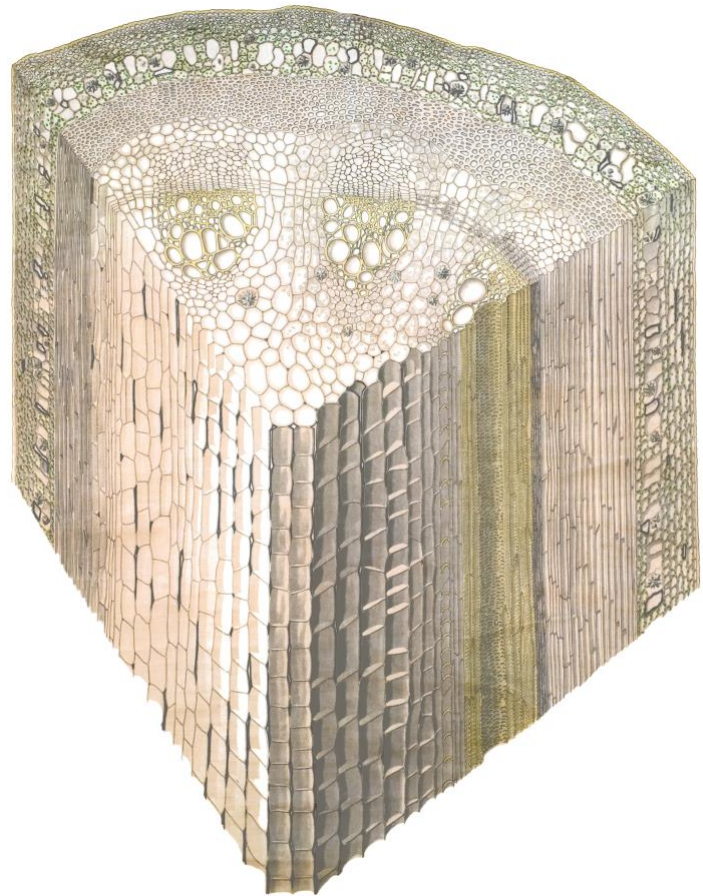
# Botany 3130 Morphology of Plants, Algae, and Fungi

## Fall 2019 Syllabus

Lecture: M/w/F 8-8:50 Naraghi 210  
Lab: W 8:00-10:45 N 210  
Professor: Andrew Gardner (he/him)  
Email: agardner1@csustan.edu  
Office: N261  
Office Hrs: TH 10-10:50 am,  
F 9-9:50 am,  
and by appt.

### Course description

Botany 3130 is a class about anatomy and morphology of plants (for the most part). We will explore the wide array of shapes and structures of plants along with briefer introductions to algae and fungi, emphasizing the use of microscopes. Botany 3130 satisfies the departmental structure and function requirement and can be used for upper division electives. Prerequisites include BIOL 1050 and 1150 plus CHEM 1100 and 1110 with grades of C- or higher (or equivalent introductory series), or consent of instructor.



I will give lectures, we'll read and discuss papers, and apply these concepts in the lab. Please check the Blackboard page for posted lectures, announcements, and other information. Labs for Plant Morphology will involve a LOT of time working with a microscope to identify morphological and anatomical structures.

I suggest you procure a notebook with blank (unlined) pages. This will be to collect your lab, field, and greenhouse notes, scientific drawings, and reflections. These will compliment a digital lab notebook to which everyone will contribute. You will earn credit for your contributions to it throughout the semester.

### Major learning objectives

1. Know common or "typical" morphological and anatomical structures of plants, including detailed understanding of plant cellular structure and contents (especially plastids), the cell cycle, and a comparative knowledge of major cell types
2. Learn about the diversity of "plant" morphologies and their evolutionary history, including major synapomorphies and sexual structures at organ, tissue, and cellular levels
3. Understand the functional nature of plant morphological diversity, focusing on organ, tissue, and cellular structure and composition
4. Become proficient with the use of stereo and compound microscopes along with basic specimen preparation and staining
5. Develop professional communication skills in multiple contexts

## Suggested Readings

I will hold you responsible for the concepts and content I present during lecture and lab. Additionally, we will be reading and discussing several scientific articles this semester. I will provide these via Blackboard and we will use google docs to work together. Many students find books to be great learning resources, and I will be drawing lecture content from several, including:

Bell. *Plant Form: An Illustrated Guide to Flowering Plant Morphology*

Raven, Evert, and Eichhorn. *Biology of Plants*

Graham, Graham, and Wilcox. *Plant Biology*

Beck. *An Introduction to Plant Structure and Development*

Esau. *Anatomy of Seed Plants*

Judd, et al. *Plant Systematics; a Phylogenetic Approach*

## Assessment

To do well in Botany 3130, you will need to come to class and participate actively. In addition, you must be diligent in your studying and group project construction. As with most biological fields, you will have to master a new vocabulary and practice learning to see patterns which will speed and deepen your comprehension.

Quizzes and exams are opportunities for you to convince me you know the material. In an exam, you need to articulate a correct answer. If you haven't articulated an answer previously (practicing in a study group, writing it, etc.,) you will have a more difficult time doing it during exam time. Exams will cover the concepts from lecture and lab, and will be multiple choice with matching, short answer and/or diagram questions. You may not leave the room during an exam without my permission. You must turn off and put away cell phones and remove hats during exams. If you arrive late, after someone has finished the exam and left the room, you will not be able to take the exam.

You need to notify me prior to missing any exam. I rarely administer exams early, but if you have a serious extenuating circumstance, we may be able to make an arrangement. If an emergency suddenly arises causing you to miss an exam, it is your responsibility to notify me via phone or email as soon as practical. Hospitalization, death of a family member, or other serious events would be valid reason for missing an exam without prior notification. Documentation for why you missed the exam is required if you want to take a make-up exam. Make-up exams are different than the regular exams given to the rest of class.

Late material will lose 25% for each day missed after the deadline. Make-up and late work for the class is possible, but only with an excuse note from some reliable person (hospital, police, etc). You must make arrangements with me to take care of any work needed to be made up.

I'll undoubtedly make mistakes along the way. If you think I've graded something incorrectly, send me an email and tell me about it and I'll make sure it's right. However, I do have a statute of limitations on regrades: one week from when I return them. September 19 is the enrollment census date (last day to choose CR/NC, drop the class easily, etc.).

Grades are based on the percentage of total points earned and are not "curved."

A	93-100%	C+	77-79%	D-	60-62%
A-	90-92%	C	73-76%	F	0-59%
B+	87-89%	C-	70-72%		
B	83-86%	D+	67-69%	CR	70-100%
B-	80-82%	D	63-66%	NC	0-69%

## **Expectations related to the learning environment**

### Students

- a. I expect students to actively participate in class discussion, group activities, and peer-peer teaching.
- b. I expect students to be prepared for class each day.
- c. I expect students to respect each other, me, the environments in which we'll operate, and themselves.
- d. I expect students will not cheat, but if students do so, they will not be surprised by an automatic F for the assignment or a referral to the appropriate disciplinary committee. Cheating is "submitting an in-class assignment for a student who is not present or submitting work that is not your own, but claiming that it is your own original work." Lying is "communication with intent to deceive" and cheating falls into that category.
- e. Please don't allow your phones to distract you from class. Please restrict your computer and internet usage to relevant classroom activities to keep from distracting your classmates or me.
- f. Please discuss with me any circumstances or accommodations you would need so we can ensure that the class is an environment in which you can learn and have fun. Please do so within the first full week of class, but don't hesitate to talk to me at any time about anything that is impeding your success in class.
- g. You may not eat in the laboratory, but I will give you breaks, and encourage you to keep the glucose levels up!
- h. Plan ahead and keep up with the assignments; and don't hesitate to talk to or email me if you're having a hard time doing so.
- i. Through this course, we will foster a sense of community as we learn to be better communicators, critical thinkers and citizens. To do this, we must all work to make our class a welcoming and productive place to learn for everyone, regardless of race, ethnicity, sexual orientation, gender identity, age, size, socioeconomic background, religion, spirituality, physical ability, mental ability, or any other aspect of one's identity.

### Professor

- a. I will come to class prepared to teach an informative lecture containing information relevant to the learning objectives.
- b. I will strive to help you prepare for your exams by giving you 'signposts' along the way to focus your study.
- c. I will not purposely be sneaky on quizzes or exams, but I have high expectations of everyone, including myself.
- d. I will answer questions respectfully and will begin and end class on time.
- e. I will set policy and strive to be fair to all students.
- f. I will return assignments/tests promptly with useful comments.
- g. I enjoy writing letters of recommendation. Because they are a letter of recommendation I do like to be able to recommend the candidate. As such, I can't usually recommend students unless they achieve a B or better in the class. In addition, if you only take the class, do well and never come talk to me, I have a hard time writing a compelling letter!

TUTORING ON CAMPUS – Free tutoring services are available to assist you in most disciplines, including in biology! - Library 112 - (209) 667-3642 - [www.csustan.edu/Tutoring](http://www.csustan.edu/Tutoring)

CAMPUS COUNSELING SERVICES – Overwhelmed by the stress of juggling classes and your home life? Our campus offers excellent counseling services to help support you! - MSR 210 - (209) 667-3381 - [www.csustan.edu/Counseling/](http://www.csustan.edu/Counseling/)

STUDENT HEALTH CENTER – You have already paid for access to health care on campus. Services include: birth control, flu shots, immunizations, pharmacy, check-ups, HIV testing, TB tests, and doctor's notes for when you are sick! - (209) 667-3396 - [healthcenter.csustan.edu](http://healthcenter.csustan.edu)

## Schedule (subject to change!):

23-Aug F	Lecture 1: Syllabus, Intros		
26-Aug M	Lecture 2: Grand tour		
28-Aug W	<i>Lab 1: microscopes + algal diversity on campus</i>		
30-Aug F	Lecture 3: Organelles + Algae that aren't "green"	Q1	10
2-Sep M	Labor Day		
4-Sep W	<i>Lab 2: Data collation and report preparation</i>	Algae letter	20
6-Sep F	Lecture 4: Green algae		
9-Sep M	Lecture 5: Cell wall basics + Bryophytes		
11-Sep W	<i>Lab 4: Bryophyte diversity</i>	Q2	10
13-Sep F	<i>Paper 1: Endosymbiotic theory</i>	Discussion prep+participation (presentation)	35 10(25)
16-Sep M	Lecture 6: Vascular tissue + Ferns and lycophytes		
17-Sep W	<i>Lab 5: Fern diversity</i>		
20-Sep F	EXAM 1	EXAM 1, Lab notebook	50 40+10
23-Sep M	Lecture 7: The seed + Gymnosperm diversity		
25-Sep W	<i>Lab 6: Gymnosperm diversity</i>		
27-Sep F	<i>Paper 2: Homosporous lifecycles</i>	Discussion prep+participation	10 10(25)
30-Sep M	Lecture 8: Gymnosperm vascular tissues		
2-Oct W	<i>Lab 7: Gymnosperm wood</i>		
4-Oct F	<i>Paper 3: Chinese redwoods from the Eocene</i>	Discussion prep+participation	10 10(25)
7-Oct M	Lecture 9: Angiosperm flowers, gametophytes, fruits : Q3		10
9-Oct W	<i>Lab 8: Angiosperm morphological diversity + flowers</i>		
11-Oct F	Lecture 10: Angiosperm flowers, gametophytes, fruits 2		
14-Oct M	<i>Paper 4: Rafflesia flower development</i>	Discussion prep+participation	10 10(25)
16-Oct W	<i>Lab 9: Angiosperm embryos and fruits</i>		
18-Oct F	Lecture 11: Collenchyma and Sclerenchyma		
21-Oct M	Lecture 12: Angiosperm xylem and phloem	Q4	10
23-Oct W	<i>Lab 10: Angiosperm wood</i>		
25-Oct F	EXAM 2	EXAM 2, Lab notebook	65 50+15
28-Oct M	Lecture 13: Roots		
30-Oct W	<i>Lab 11: Roots</i>		
1-Nov F	<i>Paper 5: Legume microbiomes</i>	Discussion prep+participation	10 10(25)
4-Nov M	Lecture 14: Shoots		
6-Nov W	<i>Lab 12: Shoot diversity</i>		
8-Nov F	<i>Paper 6: Evolution of root and stem succulence</i>	Discussion prep+participation	10 10(25)
11-Nov M	Veterans' day		
13-Nov W	<i>Lab 13: Poster project proposals</i>		
15-Nov F	Lecture 15: The leaf, Q5	Q5	10
18-Nov M	Lecture 16: The epidermis		
20-Nov W	<i>Lab 14: Leaf diversity</i>		
22-Nov F	Lecture 17: Extravascular cambia + Secretory structures		
25-Nov M	<i>Paper 7: Origin of carnivorous snap-traps</i>	Discussion prep+participation	10 10(25)
27-Nov W	<i>Lab 15: Poster project work</i>	Poster draft	10
29-Nov F	Thanksgiving holiday		
2-Dec M	Lecture 18: Fungal Diversity, Q6	Q6	10
4-Dec W	<i>Lab 16: Fungal morphology</i>		
6-Dec F	<i>Paper 8: Fossil fungi</i>	Discussion prep+participation	10 10(25)
9-Dec M	Poster session	Poster	40
11-Dec W	Reading day, no classes		
13-Dec F	EXAM 3, 8:30-10:30	EXAM 3, Lab notebook	80 60+20
			430 total
			410 minus 1 quiz and 1 paper disc.