

## PLANT PHYSIOLOGY, BIOL 4300 (3 Units)

California State University, Los Angeles  
Department of Biological Sciences  
SPRING 2018

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**Instructor:** Dr. Christine Scoffoni

**Office Location:** ASCB 323A

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**Office Hours:** Wednesdays 2:00 – 3:00 PM. You can email me at any time to schedule a meeting outside of office hours.

**Lecture Location:** BIOS 245 (WILL BE IN ASCL 231 after the first week)

**Lab Location:** ASCL 231

**Class Time:** Mondays and Wednesday 10:00 AM – 1:30 PM

**Prerequisites:** Grade of C or higher in BIOL 1200; CHEM 1110.

**Course Description:** BIOL 4300 Plant Physiology will explore whole plant physiology, anatomy, morphology and development in relation to environmental stresses such as drought. After some general background in plant physiology and anatomy, we will utilize the primary literature to explore the cutting-edge research in plant responses to environmental stresses. The laboratory portion of this course heavily relies on inquiry-based learning. Students will formulate questions which they will set out to test through experimentation and data analysis. The classroom will turn into a cutting-edge research lab, and students will form a team of scientists to test out specific hypotheses. Students will perform a review of the literature on a chosen topic in relation to their experiment. By the end of the semester, experiments will be pooled and a scientific paper will be written and submitted to a peer-review journal. Because science outreach is an important part of science, students will team up during the semester to design a set of outreach activities in relation to their experiments. Towards the end of the semester, we will visit a local middle school to present the activities and engage our community with plant sciences.

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### **Course Learning Objectives:**

Upon successful completion of this course, students will be able to:

- 1) Demonstrate a good understanding of how plants respond to environmental stresses, such as drought.
- 2) Design scientific experiments and work collectively both in the lab and on writing projects.
- 3) Demonstrate a good understanding of cutting-edge techniques utilized in plant physiological sciences.
- 4) Communicate plant science research to the public.

### **Course Materials:**

#### **Textbook (suggested but not required):**

Plant Physiology and Development | 6th edition | Lincoln Taiz, Eduardo Zeiger, Ian M. Møller, and Angus Murphy | Oxford U. Press

**A list of scientific papers that pertain to the class will be posted on Moodle throughout the semester.**

**Computer Requirements:** You will need to have an up-to-date browser, operating system and some additional software on your computer to take this class. Check [the ITS Helpdesk Student Resources page](#) for instructions. Some of the documents in this course will be available to you in PDF form. You will need download and install [Adobe Acrobat Reader software](#) on your computer. You will need Excel and Word (or similar programs).

**Attendance and Studying:** Students are responsible for all material presented in class, including announcements about changes in course procedures. A fair calculation for the time required for this class should take into account the need to spend at least 1-2 hours of independent study for each class hour.

Attendance is mandatory. Students may have a valid reason to miss a class. When any of the following reasons directly conflict with class meeting times, faculty shall consider an excused absence and no penalty shall be accrued. Students are responsible for informing the instructor of the reason for the absence and for arranging to make up missed assignments, tests, quizzes, and class work insofar as this is possible. Excused absences include, but are not limited to:

- Death, injury, or serious illness of a close relation
- Religious reasons (California Education Code section 89320)
- Jury duty or government obligation
- University sanctioned or approved activities (examples include: artistic performances, forensics presentations, participation in research conferences, intercollegiate athletic activities, student government, required class field trips, etc.)

The instructor may consider other grounds for excused absences, and students may need to provide documentation for excused absences.

### Evaluation:

**Grading** (estimated points: total number of points is subject to change)

Attendance	150 points
Homework	400 points
Literature review	100 points
Outreach activity	100 points
Final paper	100 points
<u>Final Exam</u>	<u>150 points</u>

1000 points total

### **Grading Scale**

Grades in this course are not curved. Course grades will be assigned as follows:

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

### **Format of Graded Lecture Content**

1. **The final exam** is objective format (multiple choice, matching, true/false, short answer, and/or long answer questions). **No make-up tests will be scheduled. With an excused (i.e. discussed in advance or doctor's note) absence** for a test, students may schedule a make-up test. NOTE: The excused absence and make-up exam must be discussed with the instructor in advance of the exam to be missed. If evidence of emergency can be provided for a missed final, an Incomplete will be given. **All cell phones and other electronic devices are to be turned off during the exam.**
2. There were also be assigned homework that must be turned in on time as announced on Moodle or in class. Homework not turned in on time will result in a score of zero—no exceptions.

**Course Moodle Webpage** – <https://moodle.calstatela.edu/>. PowerPoint lecture **outlines** (these are NOT all you need to know for the course!), course syllabus, major grades (exams, lecture & lab totals), and announcements. Please check our Moodle course regularly for important information.

### Course Policies

- **Drop Policy**—The drop policy established by the university will be strictly followed. After the no record drop deadline (**09/05/2017**), students may drop a course only for “serious and compelling reasons”. Failing a course is not an acceptable reason for withdrawal. Acceptable documentation is required verifying the reason for the withdrawal. See the Schedule of Classes for information. **09/05/2017**: last day to add for this term. **11/15/2017**: Last day to withdraw for a grade of “W”. **12/04/2017** Emergency withdrawal period ends.
- **Credit by Exam**—Credit by exam is not offered for this course.

- **Incomplete Grade Policy**—Incomplete grades can only be assigned when the majority of the coursework has been completed (essentially all work except the final exam), and the student is passing the course (grade of C or better). The submission of an Incomplete Grade Form is required.
- **ADA Compliance:** Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation.
- **ACADEMIC HONESTY:** Students are expected to read and abide by the University's Academic Honesty Policy, which can be found at <http://www.calstatela.edu/academic/senate/handbook/ch5a.htm> as well as in the current Schedule of Classes. Students who violate this policy will be subject to disciplinary action, and may receive a failing grade in the course for a single violation. **All cell phones and other electronic devices are to be turned off during the exams.**
- **Email - All emails pertaining to the course must come from your CSULA email account.** E-mail correspondence with the professor and lab instructors must be professional. Now is the time to start practicing for the job market, graduate school applications, business correspondence, etc. When you send a sloppy, unpunctuated e-mail (e.g., from your iPhone), you are conveying a message of non-professionalism, laziness, and indifference; this will hurt you dearly in the professional world. Having the discipline to write professional correspondence will benefit you!
- **Please refer to this syllabus for all course procedural questions.** This syllabus is subject to change. If a change is made, the professor will immediately notify the class and post a revised syllabus.

## **Helpful Student Resources**

### **Tutoring**

Many students need help outside the classroom to master course content. Helpful resources are available at the CSULA University Tutorial Center (<http://www.calstatela.edu/tutorialcenter>). Students can receive in-person tutoring or online tutoring in Biology.

### **Technical Resources**

Information on CSULA technical support resources for students: [Technical Support](#)

### **Student Support Services**

Information on CSULA student support resources for students: [Student Services](#)

### **Academic Support Services**

Information on CSULA academic support resources for students: [Academic Support](#)

### **Moodle Mentor Site**

Information for students on how to be a successful online student and how to use Moodle: [Moodle Mentor](#) (Moodle Tutorials)

## **COURSE & UNIVERSITY POLICIES**

### **Student Handbook**

Information on student rights and responsibilities, academic honesty, standards of conduct, etc., can be found in Schedule of Classes for the current quarter visit the Cal State LA [Schedule of Classes Information](#) under Policies and Procedures.

**Dropping and Adding** Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. Students should be aware of the current deadlines and penalties for adding and dropping classes by visiting the [GET home page](#). (Registrar news and information)

### **Americans with Disabilities Act (ADA)**

Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation. For more information visit the [Office for Students with Disabilities](#) home page. <http://web.calstatela.edu/univ/osd/atlc.php>.

**Course Schedule (note that the schedule may change; any changes will be announced in class or on Moodle).**

Week	Date	Class content	Homework due at end of lab
1	Jan. 22	What is a scientist? What is a botanist? Intro to lab.	
	Jan. 24	Water relations/ stomata lab.	Stomata lab worksheet
2	Jan. 29	Experimental design/ lit review	Exp. Design worksheet
	Jan. 31	Diversity of plant anatomy and function/ lit review	List of 15 papers due
3	Feb. 05	Rachel Meyer Visit/ Planting seeds for experiment / Lit Review	
	Feb. 07	Review of water transport and anatomy / Planting seeds for experiment / Lit Review	
4	Feb. 12	Photosynthesis, Sun vs. shade, Transpiration experiment	Transpiration
	Feb. 14	Introduction to equipment and traits/ Lit review	Lit review draft due
5	Feb. 19	Peer review of lit review/ Intro and experimental design	
	Feb. 21	<b>Field trip: Huntington Gardens: meet at gardens at 10:30am sharp.</b>	Bot garden worksheet
6	Feb. 26	Drought tolerance class and lab 1	Lab worksheet and Lit Review due
	Feb. 28	Drought tolerance class and lab 2	Lab worksheet due- Paper critique due
7	Mar. 05	Mojave desert project/gmin	Excel sheet with data due
	Mar. 07	Mojave desert project	Excel sheet with data due
8	Mar. 12	Mojave desert project/ experimental design Rice	Excel sheet with data due
	Mar. 14	Start experimental treatment/Measure stomatal conductance and leaf water potential/ PAR/leaf thickness / SPAD	Excel sheet with data due
9	Mar. 19	Leaf thickness / SPAD / gmin/ stomata peel/ start leaf clearing /Intro Methods Mojave revisions/ finalize data for results	Excel sheet with data due
	Mar. 21	Measure stomatal conductance and leaf water potential/ thickness / SPAD / check leaf clearing, image stomata peels/ start data analysis	Excel sheet with data due
	Mar. 26	<b>SPRING BREAK</b>	
	Mar. 28		
10	Apr. 2	Measure stomatal conductance and leaf water potential/ leaf thickness / SPAD/ image leaf veins/ final harvest/ hydraulics/ PV Curves	Draft of Mojave paper due
	Apr. 4	Data analysis/ Intro and Methods write up/ Image and measure leaf veins and dry masses	
11	Apr. 9	Data analysis/ Intro and Methods write up/ Image and measure leaf veins and dry masses	Intro and Methods Rice due
	Apr. 11	Results write up	
12	Apr. 16	Results write up	Results due
	Apr. 18	Discussion write up	
13	Apr. 23	Discussion write up	Discussion due
	Apr. 25	Outreach activities prep/ Peer review discussion	Outreach idea
14	Apr. 30	Outreach activities prep	Outreach outline
	May. 2	Outreach activities demo in class	In class demo
15	May. 7	Outreach activities at middle school	
	May. 9	Outreach activities at middle school	Final paper due
Final	TBA		