

Plant Physiology (BI:404)

Spring 2005

Instructor: Dr. Alissa Packer

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Office: Fisher 206A

Office hours: by appointment

Lecture: BH008, MWF 10:00-11:05

Lab: FSH 243 M 1-4

Course readings:

Textbook (required)-

*Raven, P.H., Evert, R.F., and S.E. Eichorn. 1999. *Biology of Plants*. W.H. Freeman and Company/Worth Publishers, NY, U.S.A.

*Weekly readings from the primary literature will be assigned in class.

Course description:

Because this will be the first plant-focused course that many of you have taken, we will necessarily begin with an introduction to basic botany. We will review the adaptations of plants to life on land, the diversity of plants, as well as the structural features of plant cells, tissues, and organs. We will then explore fundamental principals of plant physiology (transpiration, photosynthesis, translocation, nutrient uptake), with an emphasis on how these physiological processes are affected by abiotic and biotic environmental factors.

Course objectives:

By the end of this course, you should gain a greater appreciation for plants and their importance to your daily lives. Furthermore, upon completion of this course you should better understand 1) the mechanisms plants use to obtain water, carbon and mineral nutrients, 2) the processes underlying plant growth and development, and 3) how plants acclimate and adapt to environmental stresses.

Course structure:

Because class size is very small, you will have the opportunity to teach one another. We will operate more like a seminar than a traditional lecture course. You will be responsible for contributing to class on a daily basis. In order to participate effectively, you will need to read all assignments before class. Each student will lead a discussion of an article from the primary literature once during the semester. Additionally, each student will be responsible for teaching their classmates during one lecture period (see syllabus).

Point distribution:

60% Exams (4 exam@15%)

20% Research paper (Annotated bibliography 10%, First draft 20%, Final draft 70%)

10% Lecture on a plant hormone

5% Article presentations

5% Preparation & participation

Grading scale:

A: 93-100%

A-: 90-92.9%

B+: 87-89.9%

B: 83-86.9%

B-: 80-82.9%

C+: 77-79.9%

C: 73-76.9%

C-: 70-72.9%

D+: 67-69.9%

D: 63-66.9%

D-: 60-62.9%

F: <60%

Attendance: You should notify me if you have a legitimate reason for missing a class. Attendance will be taken into account in your class preparation/participation points. If you have more than 3 unexcused absences you will not receive any points, therefore your final grade will drop by 5%. Six or more absences may result in failure in the course. You will not be permitted to make up any assignments that were missed during an unexcused absence.

Make-up exams: Make-up lecture exams will be given only in extreme circumstances. They will require written documentation from the Dean of Students. Anyone who fails to comply with these procedures will receive a zero for missed exams.

Late assignments:

All assignments will be collected at the *beginning* of class on the due date (unless otherwise noted on the syllabus). Late assignments will be downgraded by 10% for each day late unless prior arrangements have been made.

Academic dishonesty:

Academic dishonesty of any kind will not be tolerated. The University policy on cheating, plagiarism and all other forms of academic dishonesty can be found at www.susqu.edu/campus_center/handbook/academic_honesty.pdf. All violations of will be dealt with as outlined by University procedure. Research papers must be submitted to **turnitin.com** in order to be graded.

Below is a tentative schedule that is subject to change as the semester progresses. Attending every lecture is the best way to stay informed of changes to the syllabus. You are responsible for finding out about any information that you may have missed due to an absence.

LECTURE SCHEDULE				
Date	Topic	Textbook Reading	Other reading	Assignment Due
1/17 M	Intro to botany and plant physiology			
1/19 W	Overview of plant structure and function	Ch. 1		
1/21 F	Overview of plant structure and function	Ch. 1		
1/24 M	Molecular composition of plant cells	Ch. 2		
1/26 W	Intro to plant cells & tissues	Ch. 3, Ch. 24		
1/28 F	Water and plant cells	Ch. 4 pp. 76-81		
1/31 M	How to search the primary lit			Summary of 4 articles
2/2 W	Whole plant water relations	Ch. 25		
2/4 F	Whole plant water relations	Ch. 31 pp. 751-764	Ryan & Yoder, Hydraulic limits to tree height...	
2/7 M	EXAM I			

2/9 W	Intro to photosynthesis	Ch. 7 pp. 126-132		
2/11 F	Light reactions	Ch. 7 pp. 133-139		List of 10 articles from primary lit
2/14 M	Light-independent reactions	Ch. 7 pp. 139-142		
2/16 W	Photorespiration	Ch. 7 pp. 142-153		
2/18 F	C4			
2/21 M	CAM		Black & Osmond, CAM: 'working the night shift'	
2/23 W	Phloem transport	Ch. 7 pp. 764-771	Ehleringer et al., Atmospheric CO ₂ .	
2/25 F	Mineral nutrition	Ch. 30 pp. 726-736		Annotated bibliography
2/28 M	Symbiosis & nitrogen fixation	Ch. 30 pp. 736-749		
3/2 W	Symbiosis & mycorrhizae	Ch. 15 pp. 340-344	Schultz et al, Evidence of a mycorrhizal...	
3/4 F	EXAM II			
3/7 M	NO CLASS			
3/9 W	NO CLASS			
3/11 F	NO CLASS			
3/14 M	Dormancy & germination	Ch. 23 pp. 562-569, Ch. 29 pp. 717-719		
3/16 W	Plant movements	Ch. 29 pp. 702-706, Table on 723		
3/18 F	Phototropism		Sherry & Galen, The mechanism of floral heliotropism	
3/21 M	Peer review of papers			First draft of papers
3/23 W	Gravitropism			
3/25 F	Student presentation 1- Gibberellin	Ch. 28		
3/28 M	NO CLASS			
3/30 W	Student presentation 2- Cytokinin	Ch. 28		
4/1 F	Student presentation 3- Abscisic acid	Ch. 28		
4/4 M	Student presentation 4- Ethylene	Ch. 28		
4/6 W	Student presentation 5- Brassinosteroids	Ch. 28		

4/8 F	Student presentation 6- Jasmonates	Ch. 28		
4/11 M	EXAM III			
4/13 W	Photoperiod and flowering	Ch. 29 pp. 709- 715, 722-723		
4/15 F	Phytochromes and light responses		Yanovsky & Casal, How plants “see”	
4/18 M	Volatiles & plant defense	Ch. 2 pp. 32-39	Pichersky, Plant Scents	Final draft of papers
4/20 W	NCUR			
4/22 F	NCUR			
4/25 M	Plant defense		Karban et al., Communication btwn. plants...	
4/27 W				
4/29 F	Senescence and leaf abscission		Hoch et al., Resorption protection...	
5/2 M	Biotechnology	Ch. 34 pp. 837- 849		
5/3 F schedule	Catch up day			
5/6 F, 11:30am	FINAL EXAM			