BIOL 366 – Plant Physiology

Course Outline - Spring Term, 2018
Tuesday, Wednesday, Friday; 11.30 -12.20 am
Cunningham 146

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COURSE OBJECTIVES: To provide a basic understanding of how plant*s* function. Topics include the capture of light energy for growth and metabolism, water relations, plant nutrition, transport processes, plant development and its control, phytohormones, and responses to environmental stimuli. Plant responses to the environment will be explored on physiological and molecular levels, illustrating that plants are actively engaged with their environment, and responsive to internal and external stimuli. The laboratory exercises reinforce these concepts and provide practical experience in plant physiology.

TEXTBOOK: Taiz et al., **Plant Physiology and Development**, 6th Edition (2015), Sinauer. Text is placed on Reserve at the Library. Older editions are also suitable.

LAB MANUAL: Biology 366 Laboratory Manual 2018 Plant Physiology (available from the Bookstore)

Web Material: Brief notes for each lecture will be made available in advance on the CourseSpaces site for the course. ***Please be aware that these are outlines, not detailed notes***; they are provided to help you organize and review the lecture material. It is thus imperative you attend lectures and take notes. Exams will be based primarily on lecture material, and readings from the text will help reinforce the concepts.

EVALUATION:	Midterm examination (Feb 20, 2018)	20%
	Lab Assignments	35%
	Final examination (April, 2018)	45%

Grade Conversion: A+ 90-100%; A 85-89.5%; A- 80-84.5%;B+ 77-79.5%; B 73-76.5%; B-70-72.5%; C+ 65-69.5%; C 60-64.5% D 50-59.5%; F <49.5%

There will be no supplemental midterm or final exams. If you miss the midterm for a **documented** medical reason, the evaluation breakdown will be adjusted accordingly. Make-up final exams will only be considered if a formal Request for Academic Concession is provided.

COURSE OUTLINE

Date	Lecture Topic	Readings (text – 6th edition)	Lab topics (weekly)
Jan 3	Introduction to Plant Physiology		No lab
5	Plant cells & anatomy	Ch 1: 1-34	
9	Water & plant cells	Ch 3: 83-97	1. Solutions,
10	Water - whole plant water relations	Ch 4: 99-110	dilutions, plant
12	Water movement: plant to atmosphere	Ch 4: 110-117	morphology
16	Mineral nutrition – essential elements	Ch 5: 119-131	2. Plant tissue
17	Mineral nutrition – ion uptake by cells	Ch 6:143-163	culture
19	Mineral nutrition – ion uptake by roots	Ch 6: 163-165	
23	Photosynthesis – light reactions I	Ch 7: 172-195	3. Mineral nutrition I
24	Photosynthesis – light reactions II	Ch 7: 172-195	
26	Photosynthesis – dark reactions	Ch 8: 203-220	
30	C3, C4 & CAM plants	Ch 8: 220-230	4. Water conduction
31	Ecological aspects of photosynthesis	Ch 9: 246-255	& transpiration
Feb 2	Transport & storage of photoassimilate	Ch 11: 285-308	
6	Respiration and general metabolism	Ch 12: 317-342	5. Photosynthesis &
7	Assimilation of mineral nutrients	Ch 13: 353-360, 367-9	plant pigments,
9	Symbiotic nitrogen fixation	pp. 360-367	mineral nutrition II
12-16	**Reading Break- no lectures or labs**		No lab
20	**MIDTERM TEST**		6. Plant growth
21	Responses to red light - phytochrome	pp. 448-461, 540-541	regulators, plant
23	Blue and UV light responses	pp. 462-474	pigments II
27	Photoperiodism and flowering	pp. 597-612	7. Nitrogen fixation
28	Photoperiodism II		
Mar 2	Plant Signal Transduction	pp. 407- 414	
6	Plant growth regulators - Auxin	414-442; 526-539,	8. Seed germination
7	Auxin II		& respiration
9	Gibberellins (elongation, germination)	pp. 517-525,	
13	Cytokinins (cell division)	pp. 567-574, 682-683,	9. Poster
14	Abscisic acid (ABA) and dormancy	431-433	presentations
16	Ethylene and ripening	pp. 517-519, 436-437	
		pp. 658-662, 684 – 686	
20	Strigolactones and novel regulators	429, 574-578	**Lab Exam**
21	Jasmonates and plant stress signals	420-421, 428, 708-711,	
23	Secondary metabolism & chemical ecology	pp. 715-724, 698-706	
27	Biotic stress physiology	chapter 23, pp. 693	No lab
28	Abiotic stress physiology	chapter 24, pp. 731	
April 3	Special Topics	TBA	No lab
4	Special topics	TBA	
6	Review		