

BIOL 366 – Plant Physiology

Course Outline - Spring Term, 2019

Tuesday, Wednesday, Friday; 10.30 -11.20 am
Cunningham 146

INSTRUCTORS: Dr. C. Peter Constabel (cpc@uvic.ca). Cunn 147a, ph. 250-721-5140
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LAB COORDINATOR / TA: David Ma, Cunn 162, ph. 250-721-5139

COURSE OBJECTIVES: To provide a basic understanding of how plants 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. You will see that plants are very active and responsive to internal and external stimuli. Plant response to the environment will be explored on physiological and molecular levels. The laboratory exercises reinforce these concepts and provide practical experience in plant physiology.

TEXTBOOK: Taiz et al., **Fundamentals of Plant Physiology, Oxford University Press, 2018.** Older editions are also suitable, and will be on Reserve at the Library.

LAB MANUAL: Biology 366 Laboratory Manual 2019 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 skeleton notes**, which are provided to help you organize and review the lecture material. Therefore it is imperative you attend lectures and take notes. Exams will be based on lecture material, and readings from the text will help reinforce the concepts.

EVALUATION:	Midterm examination (Feb 15, 2019)	20%
	Lab Assignments	35%
	Final examination (April, 2019)	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.

TENTATIVE COURSE OUTLINE

Date	Lecture Topic	Readings (Taiz et al., 2018)	Lab Topics (weekly)
Jan 8	Introduction to Plant Physiology		
9	Plant cells & anatomy	Ch 1: 1-37	- No lab -
11	Mycorrhizal associations	Ch 4: 114-119	
15	Guest Lecture - Mycorrhizal interactions		1. Solutions, dilutions, plant morphology
16	Water & plant cells	Ch 2: 46-63	
18	Water - whole plant water relations	Ch 3: 65-78	
22	Water movement - plant-atmosphere	Ch 3: 78-89	2. Plant tissue culture
23	Mineral nutrition – essential elements	Ch 4: 91-106	
25	Mineral nutrition – ion uptake by cells	Ch 6: 148-165	
29	Mineral nutrition – ion uptake by roots	Ch 4: 106-113	3. Mineral nutrition I
30	Photosynthesis – light reactions I	Ch 7: 181-212	
Feb 1	Photosynthesis – light reactions II		
5	Photosynthesis – dark reactions	Ch 8: 214-228	4. Water conduction & transpiration
6	Photosynthesis - C3, C4 & CAM plants	Ch 8: 228-238	
8	Transport & storage of photoassimilate	Ch 10: 270-301	
12	Respiration	(Chapter 11)	5. Photosynthesis & plant pigments, mineral nutrition II
13	Assimilation of mineral nutrients	Ch 5: 121-131, 140-45	
15	MIDTERM TEST		
18-22	Reading Break- no lectures or labs		- No Lab -
26	Symbiotic nitrogen fixation	Ch 5:131-139	6. Plant growth regulators, plant pigments II
27	Responses to red light - phytochrome	369-380, 457-458	
Mar 1	Blue and UV light responses	Ch 13: 380-389	
5	Photoperiodism and flowering	Ch 17: 473-489	7. Nitrogen fixation
6	Photoperiod and ecological adaptation		
8	Plant growth regulators - auxin	pp. 348-349; 432-435, 454-55, 467-468	
12	Cytokinins as regulators of cell division	pp. 351, 465-466	8. Seed germination & respiration
13	Gibberellins, elongation, and germination	Ch 12: 349	
15	Absciscic acid (ABA), dormancy and stress	pp. 415-420, also Ch 12	
19	Abiotic stress physiology I	Chapter 19	9. Poster presentations
20	Abiotic stress physiology II	Chapter 19	
22	Stable isotopes in plant biology		
26	Ethylene and ripening	pp. 467-469, 500-503	Lab Exam
27	Novel growth regulators	(Chapter 12)	
29	Plant signal transduction		
April 2	Biotic stress physiology	Chapter 18	
3	Secondary metabolism & chemical ecology	Chapter 18	
4	Review		