

Biology 330, Fall 2014

Plant Physiology

Textbook: *Plant Physiology* (5th Edition), by Taiz and Zeiger, Sinauer Associates (available at ISU bookstore)

Exams: There will be four midterm exams given during the semester. The final exam will be comprehensive. All exams contain multiple choice and short essays and each is worth 100 points. The midterm exam with the lowest score will be dropped.

Extra Credit: will be given as quizzes at the beginning of the class periodically and is worth up to 40 points

Grading: The course grade will be based on the top three midterm exams and the final exam for a total of 400 points. Extra credit will help with your final grade by up to 10%.

Learning outcome: After completion of this course, students should have a good understanding of the classical and current concepts, principles and approaches regarding the basic mechanisms of plant function underlying growth, development and survival of plants, more specifically, the areas of environmental and developmental signals, plant hormone action, signal transduction, mineral nutrition, water relations, metabolism and photosynthesis.

Disability Accommodation: Iowa State University complies with the Americans with Disabilities Act and Sect 504 of the Rehabilitation Act. If you have a disability and anticipate needing accommodations in this course, please contact (instructor name) to set up a meeting within the first two weeks of the semester or as soon as you become aware of your need. Before meeting with (instructor name), you will need to obtain a SAAR form with recommendations for accommodations from the Disability Resources Office, located in Room 1076 on the main floor of the Student Services Building. Their telephone number is 515-294-7220 or email disabilityresources@iastate.edu . Retroactive requests for accommodations will not be honored.

Academic Dishonesty: The class will follow Iowa State University's policy on academic dishonesty. Anyone suspected of academic dishonesty will be reported to the Dean of Students Office.
<http://www.dso.iastate.edu/ja/academic/misconduct.html>

Dead Week: This class follows the Iowa State University Dead Week policy as noted in section 10.6.4 of the Faculty Handbook <http://www.provost.iastate.edu/resources/faculty-handbook> .

Harassment and Discrimination: Iowa State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon race, ethnicity, sex (including sexual assault), pregnancy, color, religion, national origin, physical or mental disability, age, marital status, sexual orientation, gender identity, genetic information, or status as a U.S. veteran. Any student who has concerns about such behavior should contact his/her instructor, Student Assistance at 515-294-1020 or email dso-sas@iastate.edu, or the Office of Equal Opportunity and Compliance at 515-294-7612.

Religious Accommodation: If an academic or work requirement conflicts with your religious practices and/or observances, you may request reasonable accommodations. Your request must be in writing, and your instructor or supervisor will review the request. You or your instructor may also seek assistance from the Dean of Students Office or the Office of Equal Opportunity and Compliance.

Contact Information: If you are experiencing, or have experienced, a problem with any of the above issues, email academicissues@iastate.edu.

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Course Outline

SECTION A: Plant cell, water and solutes, and Photosynthesis (Guo, Aug 25 – Sept 5, 5 lectures; Yin, Sep 8-
Sep 24, 6 lectures)

Introduction to plant cell and gene expression	Ch 1-2
General properties of water and solutions	
Water transport and movement in plants	Ch 3-4
Mineral nutrition	
Solute transport	Ch 5-6
<u>Photosynthesis</u>	
Light and light absorption.	Ch 7
Electron transport	Ch 7
Photophosphorylation	Ch 7
Photosynthetic carbon assimilation	Ch 8
Environmental effects on photosynthesis.	Ch 9

Midterm exam 1: Sept 22, 9-9:50am

SECTION B: Biochemistry and Metabolism (Yin, Sep 24-Sep 26, 2 lectures; Guo Sep 29 – Oct 15, 8 lectures)

Phloem Transport	Ch10
Respiration	Ch 11
Lipid metabolism	Ch 11
Assimilation or mineral nutrients	Ch 12
Secondary metabolites and plant defense	Ch 13

Midterm exam 2: Oct 17, 9-9:50am

SECTION C: Growth and Development-1 (Guo, Oct 20 – Nov 10, 10 lectures)

Signal transduction	Ch 14	
Embryogenesis, meristems and plant patterning	Ch 16	
The control of flowering	Ch 25	Phytochrome
and light control	Ch 17	
Blue light responses	Ch 18	

Midterm exam 3: Nov 12, 9-9:50am

SECTION D: Growth and Development-2 (Guo, Nov 17 – Dec 12, 10 lectures)

Cell Wall	Ch 15
<u>Role of plant hormones</u>	
Auxins	Ch 19
Gibberellin	Ch 20
Cytokinins	Ch 21
Ethylene	Ch 22
Abscisic Acid	Ch 23
Brassinosteroid	Ch 24
Abiotic Stress	Ch 26

Midterm exam 4 & Comprehensive final exam: Dec 16, 7:30-9:30am