BIO 328: INTRODUCTORY PLANT PHYSIOLOGY

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https://sites.cns.utexas.edu/roux

2017 COURSE SCHEDULE

DATE	TOPIC
Jan. 17	Course introduction
19	Life cycle of higher plants: fertilization to seed germination
24	Life Cycle of higher plants: seedling growth to senescence
26*	Plant cells and their growth. Role of wall enzymes in growth
31	Fueling growth; (i) Mineral nutrition
Feb. 2	Fueling growth; (ii) Photosynthesis-light reactions
7	**Test**
9	Fueling growth; (iii) Photosynthesis–the carbon reactions
14	Food and water delivery systems; (i) Phloem
16	Delivery systems, cont. (ii) Xylem
21	Growth regulation by light - phototropism
23, 28	Growth regulation by light cont. - photomorphogenesis
Mar. 2	Growth regulation by gravity
7	Growth regulation by hormones (i) auxin; (ii) GA
9	**Test**
21, **23***	Growth regulation by hormones (iii) ABA; (iv) ethylene; (v) cytokinins
28, 30	Growth regulation by hormones (vi) brassinosteroids, (vii) strigolactones
Apr. 4-11	Regulation of plant wound responses by systemin, jasmonic acid, volatiles, eATP
13, 18	Regulation of plant responses to pathogens by salicylic acid
20	G-proteins & Inositol phospholipids in cellular signaling
25, 27	Ca^{2+} and Ca^{2+}-binding proteins in cellular signaling; Problem of specificity
May **2**	**Test**
4	Biotechnology: Plants and the Profit motive
15	**Final Exam (2:00 to 5:00 PM)**

GRADING: The highest test grade will be worth 30 pts, the middle-value test grade 20 pts, and the lowest test grade 10 pts. The homework assignments will be worth 10 points (see description below); the Final Exam will be worth 30 pts of the final grade. For final letter grades, no +/-.

Bonus Quizzes on Jan 26 and March 23 (worth 2 points each toward the final grade)

TEXT: *Plant Physiology, 6th Edition (2015)* (Lincoln Taiz et al.) is recommended, but not required.

REQUIRED READINGS will be handouts or review articles kept on reserve in the Life Sci. Library.

OFFICE HOURS: Stan Roux**:** Tue, Th 11-noon, or by appointment **[**Office: Bio 16; Phone: 471-4238]
Drew Wallen: MW: 11-noon, or by appointment.

Course Goals: Through lectures, class discussions and essay-style tests, the course aims to convey an up-to-date knowledge of important information and concepts in the broad field of plant physiology. Course will highlight aspects of plant growth, development, cell signaling, and stress responses that are very similar to these processes in animals, but will also illustrate unique aspects of plants that are fascinating and exemplify the diversity of life strategies on earth. Course should help students develop critical skills in evaluating current literature, data interpretation, and methods for solving key questions in the field.

Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 512-471-6259, http://www.utexas.edu/diversity/ddce/ssd/

Homework assignments: All of the tests in this course are short essay style. Experience has shown that one of the best ways to prepare for these tests is to summarize some of the main points of each lecture in the form of essay-style questions and answers. For example, after the lecture on the Life cycle of higher plants, essay questions that would highlight a major focus of the lecture would be:
1. *Arabidopsis thaliana* is self-compatible. What additional genes would it need to become a self-incompatible plant, and what is the evidence for this conclusion?
Ans.: Genes encoding SCR (male factor) and SRK (female factor). When these two genes were transformed into Arabidopsis thaliana, it became self-incompatible.

2. Where would these genes need to be expressed for *A. thaliana* to reject self pollen?
Ans.: SCR would have to be expressed in pollen and SRK would have to be expressed in the stigma.

Other examples of essay-style questions with short answers are on the course website.

Because students who consistently carry out this exercise after every lecture consistently do well in the course, we will encourage students to do this by making it a homework exercise. Students can turn in homework assignments as individuals or can work in teams of two. Individuals will turn in one question and answer for one lecture each week, and each team will turn in two questions and answers that highlight the main points of one of the lectures each week. Each team can divide the work any way it chooses. Teams will be identified by number, not by name, and the numbers will be assigned by Dr. Roux. The homework (i.e., either one question and answer each week for an individual, or two questions and answers for one of the lectures in a week for a team) will be turned in to the Assignment page of Canvas. Each homework assignment submitted should identify who is turning in the assignment (an individual or the Group number) and the lecture about which the questions are directed. Individuals and teams can choose either lecture each week to base their assignment. The questions and answers will be due by 5 PM of the day after the lecture. Dr. Roux will edit the questions, and duplicate questions will be eliminated. The edited questions and answers will be posted on Canvas for everyone to see. Each individual and team will do 10 homework assignments during the semester, and these assignments will count for 10 points of the final grade. In general, full credit for homework will be given if it is turned in on time and the questions are reasonable, even if the answers given are partially incorrect. If the questions turned in for a specific lecture do not relate to the lecture material covered that day, or if the answers given are totally incorrect, no credit will be given.

Notes on Tests, Bonus Quizzes and Grading

All the Tests and Bonus Quizzes are short essay style. You can check the web for examples of Tests given in past years https://sites.cns.utexas.edu/roux

The Bonus Quizzes (on Jan. 26 and March 23) will be short 5-minute quizzes in the same essay style as the full Tests. They will be given at the **beginning** of the lecture period, so be sure to be on time. These short Quizzes will be based only on the lecture material covered in the previous lecture period. Historically, bonus points earned from the Bonus Quizzes have made the difference of a letter grade for many students, so plan to take advantage of this opportunity.

An answer key for every test will be sent out by e-mail to all students shortly after every test. The quizzes and tests are graded by an experienced grader who knows the course material well. Although the grader is expert and does a very good job, sometimes he/she errs. Students are invited to discuss with Dr. Roux any of their test answers that they think may have been graded incorrectly. Dr. Roux welcomes these discussions for any test at any time during the semester up until May 10, the day Final Exams begin for the Spring term, but not afterwards.

For students who miss a Bonus Quiz for a **documented** good reason, there will be ONE make-up Bonus Quiz to be given immediately after class on May 4.

For students who miss a Test for a **documented** good reason, there will be no make-up test. Instead, for these students the value of their Final Exam will be 40 points (instead of 30 points), and, for the two tests they do take, one will be worth 30 points (higher grade), and one will be worth 20 points (lower grade).

Regarding religious holidays, please notify me of your pending absence at least 14 days prior to the date of observance of a religious holy day. If you must miss a class or an examination in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.

Notes on Extra Tutoring Help

It is Dr. Roux's hope that everyone will do well in this course. If you ever need any course material clarified, you are invited to contact him either during office hours or at some other time more convenient for you. If it is more convenient for you to send your questions to Dr. Roux by e-mail, you are welcome to do so at any time. Typically, e-mail questions from students are answered within 24 h.

It is customary for Dr. Roux to offer a group-help session in the late afternoon one or two days before each Test in BIO 214. Tentatively, then, you can expect a group help session at 5 PM on the afternoons of Monday, Feb. 6, Wednesday, March 8, and Monday, May 1.

In the past students in this course have found it helpful to study in groups. Dr. Roux will be happy to meet with any of these informal groups at any mutually convenient time.