Biology 304
Plant Physiology
Spring 2002
Dr. Daniel (Max) Taub
Lecture: FJS 148; T, TH 1:00-2:15 PM
Lab: FJS 251; TH 2:20-5:20

Instructor: Dr. Daniel (Max) Taub, Dept. of Biology
Office: Fondren-Jones 140 (the new part)
Office hours: M,W 1:00-2:00, TU 2:15-3:15, or by appointment. The best way to be sure that I can meet with you is to schedule an appointment - during office hours you might find that there are others already meeting with me.
Phone: 863-1583
Email: taubm@southwestern.edu

Course content and goals: This course will examine the functioning of plants, particularly with respect to resource capture and utilization, controls over timing and allocation, and tolerance of environmental stresses. The goals of the course include:

- Improved understanding of the functioning of plants.
- Development of ability to research topics in a scientific manner, including designing and conducting experiments.
- Development of the ability to write, particularly on scientific topics.

Course prerequisite: Students must have completed the introductory biology sequence and the sophomore course in molecular genetics prior to taking this course, or receive permission from the instructor.

Course format: This course will meet twice a week for lecture/discussion and once a week in a laboratory session. Lecture/discussion sections will be a mix of lecture, discussion of readings and peer-review of writing assignments.
Laboratory classes will focus on designing and conducting experiments to screen for plants with novel mutations that cause alterations in physiology. Typically, experiments will be designed by students one week and the experiment will be set up the next week. Because you will be responsible for designing the experiments, it is critical to come to lab prepared. If you do not do the readings and preparatory assignments ahead of time you will find it very difficult to participate fully in the laboratory. Conducting these experiments may also involve commitment of time outside the regular class hours; all students are expected to participate in these activities as needed to complete the experiments.

**Accommodations for disabilities:**

Appropriate accommodations will be made for students with disabilities in accordance with University policy. All students requesting such accommodations must consult with the Office of Academic Services. For special accommodations for exams, students must make arrangements with Academic Services at least three weeks prior to the exam.

**Readings:**

The textbook for this course is:


**Grading summary:**

Grades will be based upon performance in all aspects of the course according to the following schedule:

- **Factual knowledge**
  - 3 exams, each 10% of the final grade  
  - Factual content and accuracy of lab reports  
  - 30%

- **Intellectual and creative involvement**
  - Intellectual contributions to experimental design, execution and analysis  
  - 20%

- **Written expression**
  - Quality of writing in lab reports  
  - 28%

- **Reliability, conscientiousness, cooperativeness, punctuality, diligence**
  - General conscientiousness  
  - Participation in conducting experiments (other than during class hours)  
  - 6%
Letter grades will be based on overall percentages as follows:
Percentages of 90-99% receive an A,
80-89% B
70-79% C
60-69% D
below 60%= F
These are modified as follows- if the last digit is a 7, 8,9 a plus is added (e.g. 97= A+ ; 69= D+)
Last digit is 3, 4, 5,6 - just the letter
Last digit is 0, 1, 2 minus (e.g. 90= A-)

**More on grading:**

**Factual knowledge**

Exams will principally cover material from the lecture portions of the course, but material covered in lab may show up as well. Following each exam, students will have the opportunity to meet with the instructor and clarify and defend their answers. The grade for the exam will be determined only after this oral examination. There will be an optional final exam (during the final exam period) for students to demonstrate that they have learned material they missed on the earlier exams.

A portion of your grade will also be based upon the factual content of your written assignments (see below).

**Writing**

Developing written communication skills is an explicit goal of this course. Students will write reports for each experiment we conduct. These reports will be assessed for clarity and organization, diction, grammar and syntax as well as for understanding of the material. Reports will be peer-reviewed and peer-graded (final grading for each paper will be determined by the instructor). You will receive two separate grades for each report- one for the quality of the writing, and one for content.
Intellectual and creative involvement

We will be conducting six experiments during the semester. The general topics for these experiments will be determined by the instructor, but the details will be up to the class to determine. Each student will write an experimental design for each project, and the final design will be determined after class discussion. Grades will be based on the quality of ideas expressed in both the written designs and the in-class discussions. Intellectual contributions during the actual experimental procedures will also count to this portion of the grade.

Reliability, conscientiousness, cooperativeness, punctuality, diligence, honesty

This portion of the grade will be based on the instructor’s perception of each student’s performance. Showing up for all classes, being on time, thoughtfully critiquing the writing of other students, performing all work carefully, thoroughly, and in a timely manner and working cooperatively will all contribute to this portion of the grade. The instructor reserves the right to deduct all points in this category if he believes a student has been dishonest (in ways perhaps not covered under the honor code). This includes, for example, claiming that one is sick as an excuse to miss class, if one is well. Please simply tell me the truth. Dishonesty that is covered under the honor code is discussed below.

Another portion of the grade is reserved for conscientiousness in carrying out the experiments. These experiments will need to be tended at times other than during class meetings. Students will be working in groups, and failure to perform one’s part of the experiment puts an extra burden on the other group members, so reliability in this regard is essential.
**Attendance**

Attendance is required for all lecture and laboratory meetings. If exceptional circumstances require absence from class, arrangements must be made with the instructor ahead of time.

**Honor system**

All work is covered under the honor code. All suspected violations will be taken seriously and dealt with under the approved procedures as found in the Student Handbook.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
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<tbody>
<tr>
<td>Jan 15</td>
<td>Plants/ Introduction</td>
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<td>Mar 19</td>
<td>Plant defenses and stress</td>
<td>Taiz 347-375</td>
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<td>Jan 17</td>
<td>Natural selection and the tasks a plant faces</td>
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<td>Mar 21</td>
<td>Exam II</td>
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<td>Jan 17</td>
<td><strong>Lab</strong>: Intro to <em>Arabidopsis</em>, Extra lecture-control of photoperiodism</td>
<td>Taiz 691-716</td>
<td>Mar 21</td>
<td><strong>Lab</strong>: set up Gibberellin experiment</td>
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<td>*Mar 26</td>
<td>Bluelight results</td>
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<td>Taiz 483-490,492-503</td>
<td>Mar 28</td>
<td>Mineral nutrition</td>
<td>Taiz, 103-123,323-326</td>
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<td>*Mar 28</td>
<td><strong>Lab</strong>: Design stress &amp; defense experiment</td>
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<td>Taiz 517-535</td>
<td>Apr. 2</td>
<td>Temperature stress</td>
<td>Taiz 735-745</td>
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<td>* Apr 4</td>
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<td><strong>Lab</strong>: Set up photoperiodism experiment</td>
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<td>Apr 4</td>
<td><strong>Lab</strong>: Set up stress experiment</td>
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<td>Revised Photoperiodism materials and methods</td>
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<td>Auxin</td>
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<td>Photosynthesis I- Light reactions</td>
<td>Taiz 160-168,170-186</td>
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<td><strong>Lab</strong>: Design temperature stress experiment</td>
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Dates when an assignment is due are indicated with an asterix.
Information in this syllabus is subject to change as needed.