

**Plant Physiology BIOL 4600/4605**  
**Spring 2015-CRN 22510/22511**  
**Science Bldg. Rm. 115/116**  
**MWF, 10-10:50 and W, 3-5:50**

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**Course description:**

This course is designed for Biology majors who desire more coverage of botany-related topics and satisfies the physiology requirement for the B.S. Biology degree. Emphasis is on the physical and chemical basis of plant life relative to absorption, transpiration, manufacture of foods, growth, and reproduction. This course will include lectures, discussions, reviews of journal articles, writing assignments, videos, exams, and laboratories, and field work. Successful completion of this course gives students an understanding of the interaction between structure and function of plants and allows students to proceed with other biology courses. Prerequisites: BIOL 1620/1625, and CHEM 1220/1225. Corequisite: BIOL 4605 (lab fee \$35). 3 lecture hours per week.

**Course Goals:**

This course and its co-requisite lab have Goal 1 as their primary focus. Goals 2 & 3 will be strongly reinforced in both. For more information:

[http://dixie.edu/biology/course\\_assessments.php](http://dixie.edu/biology/course_assessments.php)

**Goal 1:** Demonstrate breadth of discipline-specific knowledge

- **Outcome 1:** Students will describe and explain fundamental topics in five principal perspectives of biology:
  - a) The chemical and molecular machinations operating within all biological processes (primary emphasis)
  - b) The centrality of genetic systems' governance of life's actions from the cellular to the phyletic (secondary emphasis)
  - c) The coordinated regulation of integrated cellular systems and their effect on the physiological functioning of organisms (primary emphasis)
  - d) The dynamic interaction of living systems with each other and their environments (primary emphasis)
  - e) The transforming role of evolution in changing life forms and how evolution explains both the unity and diversity of life (secondary emphasis)

**Goal 2:** Demonstrate the capacity to think independently and critically

- **Outcome 2:** Students will learn to employ scientific methods to acquire, analyze, and apply knowledge of biological phenomena.
- **Outcome 3:** Students will evaluate scientific ideas and information while maintaining receptivity to potential alternative predications.

**Goal 3:** Effectively convey scientific literacy through various mediums of communication

- **Outcome 4: *Reading Comprehension:*** Students will analyze and critique scientific literature: identifying hypotheses, critiquing methods, interpreting data and results, and articulating the context of discussions.
- **Outcome 5: *Written Communication:*** Students will produce well-written reports and/or research papers covering topics in biology. These papers will be presented in the accepted formats of scientific research articles.
- **Outcome 6: *Oral Presentation:*** Students will publicly present scientific information covering specific topics in the biological sciences. Presentations will adequately communicate data and information in a clear and logical format.

**Specific Course Objectives:**

Upon successful completion of the assignments, laboratory exercises, and exams in this course, the student will be able to:

- Identify plant cell structures and their functions,
- Calculate plant water potentials using pressure bombs,
- Identify and treat mineral deficiencies,
- Know the role of different plant pigments and isolate them using chromatography,
- Know the chemical pathways of different types of photosynthesis
- Measure photosynthesis and fluorescence
- Know the steps involved in nitrogen fixation in legume symbionts
- Culture plant cells
- Know the control of plant germination, growth, reproduction and senescence by hormones

**Required textbooks:**

*Plant Physiology 5<sup>th</sup> Edition*, Taiz and Zeiger, Sinauer Associates, Inc.

Errors and other complementary material can be found here:

[www.plantphys.net](http://www.plantphys.net)

**Other required class materials:**

- Notebook or other suitable paper for class notes
- A separate bound notebook for lab
- All exams must be filled in with pencil or a blue or black ink pen.
- There are no supplemental materials for this course.

**Attendance:**

“Regular and prompt attendance in classes and laboratory sessions is expected of every Dixie State College student. Attendance requirements are established by each instructor and such requirements are enforced by the College. No absence excuses a student from completing work missed. It is the student’s responsibility to find out which assignments will be missed.”

Please note that any information provided in lecture including assignments and exams not currently mentioned in the syllabus are your responsibility and your absence will not constitute a valid excuse for ignorance of such things.

**Labs:**

The lab component of this course is required. Lab is registered for and graded separately, counting for 1 credit. You must register for the lab in addition to the lecture however this syllabus covers both. There will be no lab the first week of class. There are no make-up labs due to the nature of the course but partial credit may be earned by completing the exercises covered on your own time if you miss lab for a school event (requires advance notice) or a medical emergency (documentation required).

Lab grades will be 40% participation (determined by attendance AND by your research group) and 50% group research paper (35%), oral (5%), and poster presentations (10%) (Goal 2 Outcomes 2 & 3/Goal 3 Outcomes 5 & 6).

**Lecture Presentations (Goal 1 Outcome 1, Goal 3 Outcome 6):**

Students will prepare a partial lecture of each chapter covered during the semester. The amount of material that must be covered will be the equivalent of 25-33% of a chapter depending on which one is assigned to a pair.

**NOTE: lecture topics will be decided by the class the first day of the semester and so there is not a list in this document.**

**Literature Days (Goal 3 Outcomes 4 & 6):**

Most Fridays, class time will be spent discussing relevant peer-reviewed literature. Students will work in pairs and will be responsible for selecting and presenting a paper during the semester. Sign-ups for presentation dates will be available the first week of class. Students will be graded not only on their presentations but also on their participation on days when they do not present. Participation includes a short written summary (half-page) of all presented papers and one question you intend to ask during class.

**Discussion boards (Goal 3 Outcome 4):**

Every member of the class will be assigned group of plants and must post something about their group for every chapter we cover. Two topics will be allowed gaps to account for the differences in research on different groups. Posts are required to be a minimum of 4-5 sentences long with peer reviewed citations provided. The information posted must be clearly relevant to the subject.

In addition, every member of the class is required to post two substantive comments or questions per week. Those not posting in a given week are required to post substantive comments on all posts that week.

**Papers:**

Due on Feb. 13<sup>th</sup> is a two page paper nominating a new species to be added to the teaching collection. This paper is in lieu of meeting for class on the 11<sup>th</sup> and 13<sup>th</sup> when Dr. O'Brien has to be at a conference.

**Exams:**

There will be a midterm exam covering the material from lecture and a cumulative final (Goal 1 Outcome 1). All exams will be take-home, open-everything, research-based long answer questions.

Midterm Exam	Available	March 2
	Due	March 16

Final Exam	Available	April 20
	Due	May 4 (midnight)

All exams are scheduled through Canvas although the dates are subject to change. It is your responsibility to know the dates and any changes to the schedule.

**Grades:**

Lecture presentations:	20%
Literature presentations (includes participation 10%):	25%
Discussion boards	20%
Paper:	5%
Exams:	30%

The above percentages reflect the weight given to each category even though the points displayed on Canvas may differ.

**For additional important information go to: <http://dixie.edu/reg/syllabus/>**