# PBIO 424/524: Advanced Plant Physiology - Spring 2008
# Call #s 05137 and 05143; 3 credit hours

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**Contact information:**


Instructor: Dr. Ahmed Faik
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Office hours: by appointment


**Course schedule:**

Lectures: M,W,F 9:10-10:00 am, Porter Hall 417

**Textbooks:**

Required: Taiz, L and Zeiger, E ***Plant Physiology***, THIRD EDITION, Sinauer Associates, Inc., Publishers, 2002 (ISBN 0-87893-823-0)

Optional: Buchanan. ***Biochemistry & Molecular Biology of Plant***, Wiley Publishers, 2002

Handouts: Distributed during the class, and as ppt at http://oak.cats.ohiou.edu/~faik/uploads

**Course objectives**:

Plant Physiology is the convergence of two distinct fields: Biochemistry and Genetics/Molecular biology. Plant Physiology today is becoming more integrative and consists of the study of why a plant responds to effectors in certain ways (Physiological adaptation) and how does it (biochemical pathways, genome plasticity), which includes the study of how cells interact with each other.

This course satisfies the 500/400-levels course requirements. It is designed to provide you with comprehensive exposure to the subject of plant physiology. You will learn the physical and biochemical aspects of plant physiology. Basic knowledge in plant physiology is assumed, as is recall from PBIO 210 course. The class has two components, 1) Lectures and 2) Specific topic study.

Each student will be required to conduct a bibliographic search on a specific topic chosen among the proposed topics, and write a report (5-6 pages, single space). Toward the end of the quarter, each student will make a powerpoint presentation (35-40min) on this specific topic and lead a discussion. Your participation and extensive discussion are critical for success of this component of the class. Therefore, your participation in the discussion will be graded.

**Grading policy**

Your final grade will be based on **500** points:

| **Test on lecture component** | | **Specific Topic Component** | |
|---|---|---|---|
| Exam I | 100 | Presentation (35-40min) | 100 |
| Exam II | 100 | Participation in discussion | 50 |
| Final exam | 100 | Written report (1) | 50 |
| **Total** | 300 | **Total** | 200 |

THERE WILL BE NO MAKE-UP EXAMS! If you have a written excuse for missing one exam, your course grade will be calculated on the basis of the other two exam scores. The point from each component will be added and a letter grade will be assigned, using the following scale:

| | 424 level students | 524 level students |
|---|---|---|
| A, A-: | 100-85% | 100-90% |
| B+, B, B- | 84-70% | 89-80% |
| C+, C, C- | 69-60% | 79-70% |
| D+, D, D- | 59-50% | 69-60% |

**Attendance policy**
Lecture attendance is strongly encouraged, but discussion/presentation is mandatory.

**Academic dishonesty**
The penalty of cheating on an examination or plagiarizing will be failure of the course.

**Course organization:** The course has two components:

1- **Lecture component:** It consists of 3 x 1h lectures (M, W, F, 9:10 – 10am) per week in which the physical, structural and biochemical aspects of plant physiology will be highlighted. The textbook will likely be supplemented with handouts. The contents of the lectures are grouped in three parts:

***Part-I: Physiology and Biochemistry of Plant Metabolism:***
**Carbon metabolism and bioenergetics**: *Chapter 7, 8, 10, and 11*
**Mineral and nitrogen metabolism**: *Chapter 12*
***Exam I (Tentative date: Monday 23, April)***

***Part-II: Plant Growth and its Regulation:***
**Internal factors** (hormones and regulation)*: Parts of chapters 16-23*
**External factors** (light and temperature): *Parts of chapters 17 and 18*
***Exam 2 (Tentative date: Wednesday 12, May)***

***Part-III: Environmental Stresses:***
**Stress physiology**: *Chapter 25*
**Secondary metabolites and plant defense**: *Chapter 13*
***Final exam (Thursday 12, June at 10:10 am in 417)***

2- **Discussion/Presentation component:** The goal of this exercise is to attract student's attention on recent advances in plant physiology, and to develop their capacity to use the literature to deepen their understanding in these scientific advances. Each student will make a presentation and lead a discussion on specific topics. During our first meeting, a list of topics will be provided to the students and the assignment of the topics will be done in the following week. Your participation and extensive contribution are critical for success of the class setting. Each student will also write a short report (5-6 pages, single space) on the same topic. The presentations and reports are due in the last week of the quarter (Just before finals week).

**Examples of topics**:
**-Protein translocation in cell organelles**
**-Mechanism of seed dormancy**
**-Plastidic metabolite transport**
**-NDP-sugar conversion**
**-Insect-plant interaction**
**-Cell differentiation**
**-Other suggestions?!?!**

**Guidelines for reports preparation**
Each student is expected to write a report (5-6 pages, single space) that must follow the standard publication guidelines and may be organized as follow:
*a)**First page***: This page should contain the following information: Title of the topic and your full name.
*b)**General Introduction***: This section should not exceed one and half page in which you provide the reader with concise objectives/goals and background of the topic.
*c)**Discussion of different aspects of the topic***: In this section should be organized in sections that match the introduction. In this section you can include some tables and figures from literature to help you explain ideas. Tables and figures should have a **title** and a **legend** with sufficient information to be understandable without reference to the text. Units should be included too. The words used in the text should be your own words. Do your best in explaining the ideas in your own way in your own words.