11:776:382 PLANT PHYSIOLOGY (4 Credits)

Course Synopsis

Lecture:
Tuesday/Friday
Foran Hall Room 138B
10:55 – 12:15 PM

Lab:
Wednesday
Foran Hall Room 194
2:15 – 5:15 PM

Instructor:
Dr. Bingru Huang
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Teaching assistant:
Patrick Burgess
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Textbook:
Introduction to Plant Physiology
3rd edition
William G. Hopkins
John Wiley & Sons, Inc., New York
*on reserve in Chang library*

Reference books:

Course objectives:
This course satisfies one of the 300-level course requirements for the plant biology major. It is designed to provide students with comprehensive exposure to the subject of plant physiology. The laboratory exercises provide hands-on experiences with experiments and training in instrumental skills. Specifically, students are expected to:

1) Understand the fundamental concepts of plant physiology
2) Learn physiological mechanisms of plant growth, function, and development
3) Learn how plants respond to their environments
Course grading:

Lecture:

- First Exam 15%
- Second Exam 25%
- Third Exam 30%

Lab experiments and research project

- Lab reports 10%
- Research project - oral and report 15%
- Attendance and performance 5%

Class policy:

Attendance is expected for all lectures and labs
No make-ups for exams or labs

Academic integrity:

Please visit http://academicintegrity.rutgers.edu/ for Rutgers Academic Integrity policy
Please visit http://studentconduct.rutgers.edu/ for Rutgers Student Conduct policy

*Specific information and examples for proper citation format and avoiding plagiarism will be uploaded to eCollege during the semester.

eCollege:

All enrolled students have access to eCollege at https://ecollege.rutgers.edu/index2.jsp
- Lecture material will be uploaded one day prior to class; print and bring to class
- Lab reports are to be submitted via dropbox
- Announcements regularly posted on homepage

Research project - Oral presentation and written report

Groups will be assigned the first day of lab. Each group will conduct an independent research project based on the lab experiments and lecture material. Groups will make an oral presentation (10-15 minutes) and submit a paper on the final day of lecture, which should include the following sections common to scientific writing:

I. Introduction - define the problem, hypothesis, and objectives
II. Materials and Methods - materials, treatments, observations or measurements
III. Results - what has been found; data presented in figures or tables with statistics
IV. Discussion and conclusion - implications and interpretation of the results
V. References – Proper citations of other’s research

The paper will be evaluated based on the above components. Oral presentation will be evaluated based on organization, delivery, and visual aids. All material will be checked via TurnItIn.com for plagiarism.

*Plant material is limited, so design your project early (further discussion in lab).
# COURSE SYLLABUS

## Introduction
- **Course overview**
  - Lecture 1
- Ch. 1 The organization of plants and plant cells
  - Lecture 2

## Part I Water and mineral nutrients
- Ch. 10 Water in plant cells
  - Lecture 3
- Ch. 11 Water relations of the whole plant
  - Lecture 4
- Ch. 12 Essential nutrients
  - Lecture 5
- Ch. 13 Nutrient uptake
  - Lecture 6

*First Exam*

## Part II Carbon metabolisms
- Ch. 3 Photosynthesis: Light and pigments
  - Lecture 7
- Ch. 4 Photosynthesis: Light reaction
  - Lecture 8-9
- Ch. 5 Photosynthesis: Carbon assimilation
  - Lecture 10-11
- Ch. 6 Photosynthesis: Carbon allocation
  - Lecture 12
- Ch. 7 Respiration
  - Lecture 13-14

*Second Exam*
- Spring break

## Part III Regulation of plant growth and development
- Ch. 14 Cellular basis of growth and development
  - Lecture 15
- Ch. 15-16 Plant hormones
  - Auxin
    - Lecture 16
  - Gibberellins
    - Lecture 17
  - Cytokinins
    - Lecture 18
  - Abscisic acid and ethylene
    - Lecture 19
- Ch. 17 Photomorphogenesis - Responding to light
  - Lecture 20
- Ch. 18 Plant movements
  - Lecture 21
- Ch. 19 Photoperiodism
  - Lecture 22
- Ch. 20 Temperature control
  - Lecture 23

## Part IV Stress physiology and biotechnology
- Ch. 21 Plant response to environmental stresses
  - Lecture 24
- Ch. 22 Biotechnology
  - Lecture 25
- TBA
  - Lecture 26

*Lab research presentation*

*Third Exam*