

## 16:765:502 Advanced Plant Physiology (3 credits)

### Normally Offered:

Spring of odd-numbered years

### Instructor:

Dr. Bingru Huang

### Pre-requisites and other registration restrictions:

Undergraduate plant physiology or equivalent; organic chemistry

### Format:

Two 80-minute lectures.

### Description:

Survey of modern aspects of plant physiology with emphasis on recent literature. Topics covered include nutrition, development, stress physiology; and crop physiology. The purpose of this class is to learn basic concepts of plant functions and physiological activities, to understand physiological/molecular mechanisms of plant adaptation to various environmental stresses, and to learn research methods and instruments that can be used to evaluate plant stress tolerance

### Topics:

- I. Basic concepts of plant physiology
  - A. Carbohydrate metabolism
    - i. Photosynthesis
    - ii. Respiration
    - iii. Carbon balance and partitioning
  - B. Water relations
    - i. Cellular aspect of water potential
    - ii. Water uptake and water use
  - C. Plant nutrition
    - i. Functions of essential nutrient elements
    - ii. Nutrient uptake and transport
  - D. Plant hormones
  - E. Characteristics of major hormones
  - F. Functions and environmental regulation
- II. Environmental stress physiology
  - A. Drought
  - B. Flooding
  - C. Salinity
  - D. Heat stress
  - E. Chilling and freezing
  - F. Light
- III. Biotechnology and environmental stress

### Student Assessment :

Lecture:

Test I	15%
Mid-term Exam	25%
Test II	15%
Final Exam	30%

Research project	15%
Paper	
Oral presentation	

**Other requirements:**

Attendance is expected by all. No make-up for the exam