BIO 442/642 – Introduction to Plant Physiology

Instructor: Dr. Paul J Schulte, WHI-308, 895-3300, paul.schulte@unlv.edu

Text: Taiz L and E Zeiger. 2015. Plant Physiology (6th edition). Sinauer Associates Inc., Sunderland MA, USA

Course Description: This course is an introduction to the physiology of plants; a topic concerned with the internal processes within plants that are responsible for their growth and development and for their responses to the external environment. (4 credits: two 1½-hour lectures and one 3-hour lab per week)

Course Web Page: A web page for this course may be found at http://faculty.unlv.edu/schulte/BIO442/. This page will contain a number of items related to the course including handouts and links to other useful sites. The text publisher maintains a web site for the text; see http://6e.plantphys.net.

Specific Learning Objectives: Upon completion of this course, students should be able to:

- Describe the water relations of plants, including processes associated with the uptake, transport, and transpiration of water.
- Describe the mineral nutrients of plants, including the specific roles of various elements, how they are acquired by plants and chemical roles in metabolism.
- Explain the role of transport processes at the cell membrane to whole organism level in distributing water, nutrients and organic compounds.
- Provide a detailed description of important metabolic pathways including photosynthesis, respiration, and nitrogen metabolism.
- Discuss in detail the growth and development of plants and how these processes are controlled by plant hormones.
- Explain many aspects of stress physiology including the effects of water, high and low temperature and soil salinity on plant growth and survival.

Grading: There will be three lecture exams including the final. Each exam will count for 25% of the grade. We will not have lab exams, but a lab report will be required for each lab experiment. The total lab report contribution to the grade will be 25%. The final exam (unlike the first two exams) will be somewhat comprehensive in that it will include some general concepts for the entire course.

Lab Reports: You will receive instructions on preparing the lab reports from the first lab.

Disability statement: The UNLV Disability Resource Center (DRC) houses the resources for students with disabilities. If you have a documented disability that may require accommodations, you will need to contact the DRC for coordination of services. The DRC is located in the Student Services Complex (SSC) Room 137. Their numbers are:

(702) 895-0866/Voice; (702) 895-0652/TDD; and (702) 895-0651/Fax. For additional information please visit http://www.unlv.edu/studentlife/drc.

Academic Honesty: Academic dishonesty is defined by UNLV (see undergraduate catalog) to include any act that violates the academic processes of the university. These acts include, but are not limited to, cheating on an examination, stealing examination questions, substituting one person for another at examinations, falsifying data, destroying or tampering with or stealing a computer program or file, and plagiarism (using as one's own the ideas or writings of another). The punishment recommended by UNLV for academic dishonesty may be a failing grade for the course and initiating a disciplinary review as described in the university's rules and disciplinary procedures. The result of the review may be a warning, probation, suspension, or expulsion.

Outline of Topics

Week	Topic
1	Introduction. What is plant physiology? Special characteristics of plants. Overview of plant structure and plant cells (Ch. 1)
2	Genes and gene expression background (Ch. 2)
3	Water and plants (Ch. 3 & 4)
4	Mineral nutrition and transport (Ch. 5 & 6)
5	Transport processes (Ch. 6 & 10)
6	**Exam I (water, minerals, transport) – Monday, 02 October** Photosynthesis – photochemistry (Ch. 7)
7	Photosynthesis – carbon chemistry (Ch. 8)
8	Photosynthesis – physiological ecology (Ch. 9)
9	Respiration (Ch. 11)
10	Nutrient metabolism (Ch. 12)
11	**Exam II (metabolism) – Monday, 06 November** Growth & Development (Ch. 16)
12	Plant hormones (Ch. 19 – 24)
13	Photomorphogenesis (Ch. 17 & 18)

14	The control of flowering (Ch. 25) Thanksgiving recess – 28, 29 November
15	Stress physiology (Ch. 26)
16	**Final exam – Monday, 11 December, 1 - 3 PM**