

**COURSE Syllabus: BIOL 3400 Plant Physiology (Spring, 2017); CRN 21279**

**Lecture:** TR: 2:00 – 3:15 p.m. (BC 2022)  
**Laboratory:** R: 10:00 a.m. - 12:50 p.m. (BC 2040)

**Instructor:** Dr. Russ Goddard, BC 2090, Office Phone: 249-2642

**email:** [rgoddard@valdosta.edu](mailto:rgoddard@valdosta.edu) **Office Hours:** MW: 11:30 a.m. – 12:50 p.m. T: 11:30 a.m. – 12:30 p.m.

**Course Catalog Description:** BIOL 3400, Plant Physiology, 3-3-4. **Prerequisite:** BIOL 1107K, BIOL 1108K, BIOL 3200, CHEM 1211/1211L, CHEM 1212/1212L. An introduction to basic principles of plant function including physical processes occurring in plants, water relations in whole plants and plant tissues, cell physiology and biochemistry, and growth and development.

**Text:** Jones, R., H. Ougham, H. Thomas, S. Waaland. 2012. The Molecular Life of Plants, Wiley-Blackwell ISBN: 978-0-470-87012-9

**General Course Objectives:** The instructor's goal in teaching this course is to give students a greater appreciation of the plant world we depend on and to stimulate student learning of basic concepts in plant and biological science. Specific course learning objectives aligned with Department and University learning objectives are listed at the end of this syllabus.

This course provides an introduction to basic principles of plant function, primarily covering physical processes in plants, metabolism, secondary products, cell physiology, and introducing principles of growth and development.

**Grading:** There are two parts to this course, the lecture and the laboratory. The lecture will provide an opportunity to discuss conceptual information in the text, and current topics in the subject. The laboratory will provide hands-on opportunities in structured labs and independent investigations. Both will count toward your final grade.

**Lecture Exams (300 pts):** There will be 3 one-hour exams in this course. Each exam will cover approximately 1/3 of the lecture and reading material. All exams will cover material presented since the last lecture exam but could integrate cumulative information garnered from the entire semester. Each of the three exams will contribute 100 points toward your final grade.

**Labs, Lab Projects (100 pts.):** There will be a formal weekly lab in BC 2040. Due to a lack of expensive equipment that is not duplicated, the formal lab period will often provide a demonstration of techniques and student groups will perform experiments independently using these techniques and apparatus independently during the week. Complete handouts generally will not be given for these labs (but you will receive instructions and background). Lab grading will be by attendance and participation, quizzes, and worksheets. As part of your score, you and your lab mates will fill in evaluations for each exercise for each other. Some adjustment in individual scores may be made after evaluations are completed by your group members.

**BIOL 5400 requirement: (100 pts.)** Graduate students will be required to:

1. ~~Conduct an independent research project using the knowledge and equipment introduced during laboratory. This must include original data and a complete write-up, PowerPoint presentation, or Poster presentation.~~
2. ~~A choice of:~~
  - a. ~~A written research paper discussing the current knowledge and questions regarding a topic in plant physiology. A complete paper would be one approximately 12 pages, double spaced, 12 pt font.~~
  - b. ~~An evaluation of one or more primary source literature articles dealing with current research in Plant Physiology that will be presented in oral and PowerPoint format to the class.~~

**Attendance:** Students who miss class (lecture or laboratory) will lose points toward their final grade. Don't miss class.

The final grades will be based on a percentage of your cumulative points relative to the total points possible:  
Guaranteed grade distribution is as follows (Max. pts = 400; for BIOL 3400 only):

	Undergraduate	Graduate
A = 90-100%	360 - 400 points	<del>450 - 500 points</del>
B = 80-89%	320 - 359 "	<del>400 - 449 "</del>
C = 70-79%	280 - 319 "	<del>350 - 399 "</del>
D = 60-69%	240 - 279 "	<del>300 - 349 "</del>
F = $\leq$ 59%	$\leq$ 239 points	<del><math>\leq</math> 299 points</del>

**MAKE-UP EXAMS:** I generally do NOT allow make-ups because the exams are given during the normally scheduled class times. If you know that you will miss an exam and believe that you have a justifiable reason for missing it, you must talk to me **BEFORE** the scheduled exam time, either in person or by phone to seek my approval and to arrange a suitable time to retake the exam. I determine whether you have a justifiable reason to arrange a make-up exam. Approved make-ups must be completed within 3 days of the scheduled exam date.

**Tentative EXAM SCHEDULE** (final dates to be announced during lecture):

Approx. 1/3rd schedule:

Exam 1: Thursday, 9 February 2017

Exam 2: Thursday, 23 March 2017

Exam 3: Thursday, 27 April 2017

**Final Exam Period: Wednesday, 3 May 2017; 2:00 p.m. – 3:15 p.m.**

Currently, there is no comprehensive final exam planned but this time may be used for extraneous assignments.

**FERPA:** The Family Educational Rights and Privacy Act (FERPA) prohibit the posting of grades by social security number or in any manner personally identifiable to the individual student. Grades will not be posted by social security number or by name. No grades can be given over the telephone, as positive identification can not be made by this manner.

**Students with Disabilities:** Students requesting classroom accommodations or modifications because of a documented disability should contact the Access Office for Students with Disabilities located in room 1115 Nevins Hall. The phone numbers are 245-2498 (voice) and 219-1348 (tty).

**Tentative Lecture and Laboratory Schedules:****Mid-term is 2 March 2017; Last day to withdraw without penalty is 9 March 2017**

<b>Lecture:</b>		<b>Laboratory:</b>	Tentative Schedule
<b>Week of / Date:</b>	<b><i>Topics covered: Assigned Reading:(Chapter:pages)</i></b>	<b>Date:</b>	<b>Laboratory Exercise:</b>
9 Jan.	<b>What is Plant Physiology?</b> Botany Review	9 Jan.	Lab Introduction; Plant Cells and Tissues
16 Jan.	Plant and Cell Architecture	16 Jan.	Continue Plant Cells & Tissues; Start Plant Organ Structure
23 Jan.	Water Potential Water Balance and Transport in Plants	23 Jan.	Plant Structure: Organ Structure & Function; Roots, Stems, Leaves, Growth forms
30 Jan.	Membrane Potential and Solute Transport	30 Jan.	Plant Seeds, Germination, Seedling Dev't
6 Feb.	Mineral Nutrition <b>EXAM 1 (2/9/17)</b>	6 Feb.	Finish all plant structure labs.
13 Feb.	Mineral Assimilation	13 Feb.	Amylase induction during Seed Germination
20 Feb.	Phloem Transport	20 Feb.	Analysis of $\alpha$ -amylase by glucose accumulation
27 Feb.	<b>Biochemistry and Metabolism</b> Respiration and Lipid Metabolism	27 Feb.	Analysis of $\alpha$ -amylase by starch hydrolysis
6 March	Photosynthesis: The light reactions Photosynthesis: Carbon reactions	6 March	Amylase (cont'd)
<b>13 March</b>	<b>Spring Break: No classes</b>	<b>13 March</b>	<b>Spring Break: No classes</b>
20 March	Photosynthesis: Physiological and Ecological considerations <b>EXAM 2 (3/23/17)?</b>	20 March	Plant Water Potential Plant Pressure Bomb; Transpiration
27 March	<b>Cellular Communication</b>	27 March	Measurement and characterization of Photosynthesis
3 April	Plant Defenses: Surface protection and secondary metabolites <b>EXAM 2 (10/31)?</b>	3 April	Photosynthesis Labs
10 April	Plant Defense (cont'd)	10 April	Photosynthesis Labs
17 April	<b>Growth and Development</b> Growth, development, and differentiation	17 April	Photosynthesis Labs
24 April	Hormones: Auxins, Gibberellins, Cytokinins, Ethylene, Abscisic Acid, Phytochrome	24 April	TBD
27 April	<b>EXAM 3</b>	27 April	Lab Clean-up
1 May	<b>Last Class Day; No Plant Phys this week</b>	1 May	