

## Botany 2104 - Plant Form and Function - Fall 2012

**Prerequisites:** none

**Lecture/Lab:** MWF 10:30- 12:20

**Instructor:** Dr. S. Harley **Office:** SL409M, 626-7434; **Office hours:** MWF 9:30-10:20, Th 10:30-11:50, or by appointment; **e-mail:** sharley@weber.edu

**Course URL:** <http://faculty.weber.edu/sharley/2104/2104.htm>

Plant Form and Function is one of the two core courses required for all Botany majors and minors. The other course is Botany 2114, Evolutionary Survey of Plants. The two courses are independent of each other in that one is not a prerequisite for the other. If you will be taking upper division Botany courses, you should be aware that some have both 2000-level courses as prerequisites and that others only require a specific one of the two.

Plant Form and Function is a 4 credit hour course which meets in three 2-hour blocks per week. Lab activities are integrated with lecture information. On average, you will spend approximately 2-3 hours per week in lecture time and 3-4 hours per week in activities. The first part of the course will cover plant anatomy, including subcellular structures. The second part of the course material will cover plant metabolism (respiration, photosynthesis, mineral nutrition) and plant reproduction.

### Required texts and materials

R.F. Evert and S. E. Eichhorn. 2013. *Biology of Plants*, 8<sup>th</sup> ed. W. H. Freeman and Company. Students who already have the 7th edition of *Biology of Plants* may continue to use it.

S. M. Harley, R. A. Bush, B. A. Wachocki. 2012. *Botany 2104 Lab Manual*.

Safety glasses (available at the WSU Bookstore and Chemistry stores on the 5th floor of the Science Lab Building)

### Recommended texts and materials

*Writing Papers in the Biological Sciences*, any edition, by V. E. McMillan. This text is required for Botany 2121.

*A Photographic Atlas for the Botany Laboratory* by Van de Graff et al. This text is also recommended for Botany 2114.

30 cm ruler

colored pencils

calculator

### Students With Disabilities

Any student requiring accommodations or services due to a disability must contact Services for Students with Disabilities (SSD) in room 181 of the Student Services Center. SSD can arrange to provide course materials in alternative formats, if necessary.

### Student Behavior

This class meets in a laboratory room. Therefore, food and drink (including water) are prohibited. Feet must be in enclosed shoes. Your clothing must cover your lap when you are seated. Safety glasses are required for lab activities in which you handle chemicals. Additional safety information will be covered on the second day of class.

You are expected to comply with the Botany Department Statement of Expectations of Students. The text of this statement can be found at

[http://www.weber.edu/botany/Student\\_Resources.html](http://www.weber.edu/botany/Student_Resources.html).

WSU subscribes to TurnItIn.com, an electronic service that verifies the originality of student work. Enrollment in this course may require you to submit some or all of your assignments to it this semester, and documents submitted to TurnItIn.com are retained, anonymously, in their databases. Continued enrollment in this course constitutes an understanding of and agreement with this policy.

### **BTNY 2104 Learning Outcomes**

Each unit in the lab manual begins with a list of learning objectives. Each objective contributes to one or more of the following overall learning outcomes for the course.

1. Students will be able to demonstrate knowledge of the levels of organization (molecules, organelles, cells, tissues, organs, whole plant) in flowering plants and be able to relate functional aspects at one level to function at a higher or lower level of organization.
2. Students will be able to demonstrate understanding of the adaptive significance of modifications of the three organs of vascular plants: the roots, stems, and leaves.
3. Students will be able to demonstrate knowledge of the two most basic metabolic pathways of the plants: respiration and photosynthesis. In addition, students will demonstrate understanding of the adaptive significance of the CO<sub>2</sub> concentrating mechanisms found in C<sub>4</sub> and CAM plants.
4. Students will be able to demonstrate knowledge of which chemical elements are required for plant life and examples of the specific aspects of plant life that utilize those elements.
5. Students will be able to demonstrate understanding of the interactions between plants and microorganisms in the context of plant mineral nutrition, especially with regard to the nitrogen cycle.
6. Students will be able to distinguish between asexual and sexual reproduction in flowering plants and be able to demonstrate understanding of the significance of a cloning reproductive system versus one which allows for genetic recombination.
7. Students will be able to use a compound light microscope to investigate plant structure and function.
8. Students will be able to make accurate records of visual information via annotated scale drawings.
9. Students will be able to use a basic spreadsheet program (e.g., Excel) to analyze data and draw conclusions supported by statistical analysis (t-test, ANOVA).
10. Students will be able to present summaries of data in appropriate graphs and tables and be able to interpret information provided in the form of graphs or tables.
11. Students will demonstrate good citizenship in the laboratory, including following laboratory safety guidelines and working cooperatively and collaboratively with other students.

12. Students will be able to demonstrate familiarity with and proper use of botanical terminology.

13. Students will demonstrate the ability to find and synthesize information on plant form and function from a variety of appropriate literature sources.

**Your course grade will be based on the following:**

**Exams:** There will be three 100 point exams and one 200 point cumulative final (~100 points old material, ~100 points new material). Of the 500 points available, only 400 will go towards the calculation of your grade. Either your lowest score on a 100 point exam will be dropped or your final exam score will be halved; whichever calculation gives you the higher grade will be used. Your exams will be a mixed format of multiple choice, short answer, essay, diagrams, and lab practical.

**Activities:** You will turn in 15 of your activities. See the Important Dates section of this syllabus for the 10 lab exercises that you will turn in. You must be present in order to get credit. Four of the activities will be case studies based on published research. The case studies will be conducted in class; you must be present in order to get credit. Each case study will be worth a maximum of 10 points. You will also turn in a 10 point library assignment.

**Essay:** One of the goals of this course is to provide support to the development of the Botany Student Portfolio. As part of the portfolio, students write an essay which addresses the core concepts in Plant Biology. For BTNY 2104, you are to write an essay that focuses specifically on the adaptations of flowering plants that enable them to cope with a list of ten challenges. Guidelines will be given during the fifth week of classes and will be available online.

**Calculation of Final Grade:**

Exams	65%
Lab activities	25%
Essay	10%
TOTAL	100%

Percentages to achieve a specific grade are as follows:

A $\geq$ 93%	B = 83-86.9%	C = 73-76.9%	D = 63-66.9%
A- = 90-92.9%	B- = 80-82.9%	C- = 70-72.9%	D- = 60-62.9%
B+ = 87-89.9%	C+ = 77-79.9%	D+ = 67-69.9%	E $\leq$ 59.9%

Awarding of a UW grade: miss more than one regular exam OR miss the final exam OR not turn in the Essay OR turn in fewer than eight lab activities. **Any** plagiarism in the Essay will result in a grade of zero and reporting of the student to the Dean of Students.

**NO MAKE UP EXAMS!! NO MAKE UP ACTIVITIES!! NO EXTRA CREDIT!!**

**Extra Credit:** There is no extra credit in this class. (1) If you do not have time to master the content

material and complete the given assignments, you certainly do not have time to do extra work. (2) It is not to fair to your classmates for you to have different criteria for your grade.

**Important Dates:**

- Sept 3            Labor Day - no classes
- Sept 12          last day to turn in "Storage Polymers of Seeds" (10 points)
- Sept 14          Annual Botany Department Field Trip to the Uinta Mountains - class will not meet.  
For more information, go to  
<http://departments.weber.edu/botany/UMFT/home.htm>
- Sept 17          last day to turn in "Diffusion and Osmosis" (10 points)
- Sept 21          last day to turn in "Microscopy" (10 points)
- Sept 21          Exam 1
- Sept 28          last day to turn in "Eukaryotic Cell" (10 points)
- Oct 10           Library assignment due (10 points)
- Oct 12           last day to turn in "Roots" (20 points)
- Oct 19           Fall Break - no classes
- Oct 26           last day to turn in "Leaves" (20 points)
- Oct 26           Exam 2
- Nov 5            last day to turn in "Respiration" (10 points)
- Nov 5            Completed draft of Essay due  
Any essay turned in after Nov 5 will be treated as the final version.
- Nov 14           last day to turn in "Photosynthesis" (15 points)
- Nov 19           Exam 3
- Nov 21           last day to turn in "Mineral Nutrition" (20 points)
- Nov 23           Thanksgiving Break - no classes
- Nov 30           last day to turn in "The Flower" (10 points)
- Dec 3            Final version of Essay due. Turn in the marked draft, too. (scored on a 0-4 point grade scale)
- Dec 12           Final Exam, 10:30-12:20  
(Wednesday)

For additional information and support materials, visit the Botany 2104 Home Page:  
<http://faculty.weber.edu/sharley/2104/2104.htm>