Spring 2-1-2019

BIOO 434.02: Plant Physiology Lab

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BIOO 434 - PLANT PHYSIOLOGY LABORATORY - SYLLABUS - SPRING 2019

Teaching Assistant
Cameron Musser; her email is: cameron.musser@umontana.edu

Office Hours
By appointment, via email

Meeting time and room
Tuesdays 2:00 - 3:50 PM, Natural Science 207

Manual
Posted on Moodle

Course Description
This course consists of a series of laboratory exercises intended to familiarize students with core concepts and techniques in plant physiology. One week after each lab, students will submit either a worksheet or a short scientific report about the lab. Students will also work on a review of a selected topic that addresses a specific question in plant physiology and present their findings to the rest of the class at the end of the semester. The lab ***complements the lecture course BIOO 433, which is a necessary pre-requisite***. ***This is a "Partial Writing Course"*** where grades are based on writing assignments with at least one of the assignments revised based on instructor feedback.

Learning Outcomes
At the end of the lab you should be able to:

1. describe the basic structure and function of main plant organs and tissues
2. use some common research techniques in plant physiology
3. explain the basics of how plants move and retain water
4. explain the basics of why plants need nutrients
5. explain the basics of photosynthesis
6. integrate and synthesize scientific information
7. write scientific reports
8. successfully present scientific concepts/questions to an audience

Course Structure:
The course consists of a ***two-hour laboratory*** every week. Most of the labs are intended to help students visualize some basic concepts and common techniques in plant physiology (see Laboratory Schedule). ***It is important that you read each lab in advance.*** Students will learn basic data analysis techniques and how to interpret results from simple experiments. At the end of each laboratory, students are asked to either answer the questions posted in the lab manual (worksheet) or to write a short scientific report with an introduction, methods, results and interpretation. Guidelines on how to write a short report and an example are in Moodle. Although students work in pairs in the classroom and are encouraged to discuss the results in

groups, ***each student is required to write her/his own reports or worksheets independently.*** Therefore, different wording and writing structure is expected. Failure to comply with this rule constitutes academic dishonesty and with grounds for failure of the course for all students involved.

Students will also formulate a research question in a topic of their interest and review the primary literature (scientific journals in plant physiology) to address the question. The schedule below has a set of review-related homework deadlines to help you stay on top of the review. At the end of the semester, students will prepare an oral presentation about their research question and whether/how available published research answers it. Guidelines on how to develop a research question, search the primary literature and prepare an oral presentation are available on Moodle.

You are encouraged to approach either the teaching assistant or the course instructor for guidance for this lab course**.**

Grading
Late work will lose 10% of the assigned points per day.

Type of Assignment	**Points**
6 Laboratory worksheets (15 each)	90
3 Scientific short reports (20 each)	60
Topic Literature Review/Presentation	30
Total	**180**

Point Range	**Letter Grade**
90-100%	A
80-89%	B
70-79%	C
60-69%	D
<60%	F

In the past, the lab and the lecture were listed as one single, 4-credit course. However, the lecture and lab courses are now listed independently to give the opportunity to students whose major does not require the lab+lecture course, but are interested in the topic, to take only the lecture. ***Students taking both courses should view them as a single 4-credit course.*** I will assign grades to the lab and lecture portion based on what works best for each student. In some cases a combined grade is best (raises the grade of one of the courses) and in some cases it is not, in which case I will assign separate grades. For the combined grade, the lab portion (180 points) represents about one-third of the course and the lecture (450 points) the remaining two thirds.

Unfortunately, due to the nature of the course, ***laboratories cannot be made up***. If you have an extenuating circumstance that forces you to miss a lab, please talk to the instructors ***in advance*** to make some other acceptable arrangements at the discretion of the teaching assistant or course instructor. ***Any student that misses three or more laboratory sessions will automatically fail the lab course***. If the student is also taking the lecture, a lecture grade will be given according to the student's performance in lecture only. ***Failure to appear in lab or to turn in homework for a lab session counts as a missed session.***

Adds, drops and changes of grade

I will follow university policies on drops, adds, and changes of grade, which sets deadlines and dates after which course changes are not automatically approved. Requests to drop a course or change the grade basis to benefit a student's grade point average will not be approved. A grade of C or higher will be considered passing for the P/NP option.

Disability modifications

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or call 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

Schedule

Week	Date	Topic	Homework	Due Date
1	Jan. 15	General Introduction		
2	Jan. 22	LAB 1: Basics of Plant Anatomy Review question and relevance	Worksheet	Jan. 29 Feb. 5
3	Jan. 29	LAB 2: Data Analysis/Graphs Review question and relevance	Report 1	Feb. 5 Feb. 5
4	Feb. 5	LAB 3: Tissue Water potential	Worksheet	Feb. 12
5	Feb. 12	LAB 4: Mineral Nutrition: set up Rewrite Report 1	None	 Feb. 19
6	Feb. 19	LAB 5: Xylem Water Potential Research question review summary	Worksheet	Feb. 26 Feb. 26
7	Feb. 26	LAB 6: Stomatal Conductance & Transpiration	Report 2	Mar. 5
8	Mar. 5	LAB 7: Hill Reaction	Worksheet	Mar. 12
9	Mar. 12	LAB 4 Mineral Nutrition Harvest	Report 3	Mar. 19
10	Mar. 19	LAB 8: Mycorrhizae Harvest How to Make Presentations Outline presentation	None	 Apr. 2
11	Mar. 26	SPRING BREAK		
12	Apr. 2	LAB 8: Mycorrhizae Measure	Worksheet	Apr. 9
13	Apr. 9	LAB 9: Plant Hormones	None	
14	Apr. 16	Lab 9: Hormones Cont. Presentations	Worksheet	Apr. 23
15	Apr. 23	Presentations		