

IB 542 – ENVIRONMENTAL PLANT PHYSIOLOGY - SPRING 2022

Tuesday and Thursdays from 9:30 to 11:20

Room 607 Institute for Genomic Biology and Synchronous Virtual via Zoom, as needed

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COURSE DESCRIPTION AND OBJECTIVES

This course is designed for students to understand the components of the environment that are directly relevant to plant growth, physiology, and function. The course will introduce the physical principles of the environment in which plants grow (both soil and atmosphere) and how plants are impacted by and feedback on their environment. Topics will focus on components of biogeochemical cycles and biophysical pathways closely associated with the physiology of plant organs, whole plants, plant canopies, and ecosystems.

COURSE POLICIES, EXPECTATIONS, AND REQUIREMENTS

Prerequisites:

Prerequisite: IB 420 or consent of instructor.

Required Text:

There are two texts that are recommended, and both are available electronically through the University of Illinois library system. The access to the text from the link requires your computer to be on campus or linked to the University's VPN.

Bonan, G. (2015). *Ecological climatology: concepts and applications*. Cambridge University Press.
<https://doi.org/10.1017/CBO9781107339200>

Lambers, H. and Oliveira, R.S., 2019. *Plant Physiological Ecology*. Springer
<https://link.springer.com/book/10.1007/978-3-030-29639-1>

Additional readings outside of the above texts will be linked via the class website.

Evaluation and Feedback

Interactions among me, the instructor, and you, the students, during the course is essential for effective learning. Exams and in-class activities are intended to evaluate student understanding of class topics. If at any time you are concerned about your performance in the class, please come see me. I want you to succeed and am available to help. Evaluation will be based on the criteria shown on the next page (with minor changes at my discretion):

Students are expected to attend and participate in all classes. Review notes from each class, so that the concepts and information may be used in subsequent discussions. Read assigned materials for discussions, when provided or requested.

Grading:	Exam 1	25% of final grade
	Exam 2	25% of final grade
	Homework assignments and class participation	25% of final grade
	Final exam	<u>25% of final grade</u>
		100% of final grade

Your final grade will be assigned based on the following **Grading Scale:**

94-100%	A	83-86%	B	70-76%	C
90-93%	A-	80-82%	B-	60-69%	D
87-89%	B+	77-79%	C+	Below 60%	F

A few notes about...

...attendance

Attendance is expected. If you must miss class for a scheduled event, please notify me as early as possible before class. Failure to notify me will result in a failing grade (0%) for any in-class activities.

...participation

Participation in class discussions and activities is essential. This does *not* mean that I will be grading you based on the number of times you speak. Rather, I believe successful discussions result when participants are prepared and engaged. Remember to listen to your classmates, ask questions, think about what you want to say before you speak, and yield the spotlight to others.

...late work

Missed Exams may be made up only if you have an excused absence. Late work will not be accepted except under extreme circumstances.

...group work and academic integrity

Science is a collaborative endeavor. Each of you brings a unique set of interests and experiences to this course. We can all learn from each other, and I encourage you to discuss the readings with your classmates and seek their feedback. According to the Student Code, 'It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions.' Please know that it is my responsibility as an instructor to uphold the academic integrity policy of the University, which can be found here: http://studentcode.illinois.edu/article1_part4_1-401.html

...accommodations

Disability Accommodations -To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TTY), or e-mail a message to disability@illinois.edu.

Student Learning Outcomes:

At the end of this semester, students will be able to:

- Understand major components of the physical environment that directly impact plant physiology, including factors that drive variation in the environment.
- Describe the major biogeochemical cycles and biophysical pathways that are directly impacted by plants at scales from the organ to ecosystem.
- Understand the interactions between environmental conditions and plant functioning in the context of plant stress responses.
- Understand key phenological principles and their interactions with ecosystem processes.
- Demonstrate competencies in understanding plant physiological response to and interactions with biotic and abiotic stresses.
- Gain experience and understanding of measurement techniques to characterize plant canopies, ecosystem functioning, and climatic forcing variables, including sensors, measurement systems, dataloggers, and modeling tools.

Class Format:

The course will be taught in modules. How long each module take will depend on the level of understanding of material based on many criteria including in-class discussions, homework, and in-class assignments.

The format of each class will include:

Announcements and Questions (~5 minutes)

This is time allocated to announcements of upcoming class activities, follow-up questions from previous lectures, and clarification of information previously presented.

Review of previous class topic (~10 minutes)

This time will be used to discuss recently turned-in homework assignments or topics from the previous class

Lecture* (20-60 minutes)

Topics relative to the class topic will be presented here.

In-class activities* (20-40 minutes)

This time will be dedicated to students working together to answer questions or work on activities related to the lecture material. The activities may include, but are not limited to, hands-on activities, worksheets, data/figure analysis, discussion of literature, etc.

**note that multiple in-class activities may be nested within the lecture.*

A tentative course schedule, all materials and lecture slides will be available on the class website through:

<https://canvas.illinois.edu/>