

SYLLABUS

HCS 5621

PHYSIOLOGY OF CULTIVATED PLANTS

AUTUMN 2019

Course overview

Instructor Contact Information

Instructor: Dr. Jim Metzger

Office: 202C Kottman Hall (MTWR)
107 Williams Hall (F)

Phone: 614-292-3854 (Columbus office)
330-263-3813 (Wooster office)

Email: metzger.72@osu.edu

Office Hours: By appointment; please schedule appointments through the HCS office manager, [Vivienne Patlovich](#).

Time & location

Class will meet MWF from 9:10-10:05 in room 244 Kottman Hall with a video link to the video classroom located in Fisher Auditorium in Wooster. Typically, I will be presenting lecture in Columbus on Mondays and Wednesdays and in Wooster on Fridays

Prerequisites

HCS 3310 or Graduate standing or permission of instructor

Course description

A study of fundamental physiological processes in plants and how they impact crop production and productivity.

Course learning outcomes

Students will develop a basic understanding of the fundamental physiological processes occurring in plants and be able to relate this knowledge to crop productivity, yield and maintenance practices.

Lecture structure

The lectures will be PowerPoint-based. For your convenience, I will post the slides on [Carmen](#) at least 24 hours prior to lecture. In addition, lectures will be recorded, and a link posted in Carmen within a day or two.

Textbook (required)

WG Hopkins & NPA Hüner (2009) *Introduction to Plant Physiology*, 4th ed. Wiley
ISBN 978-0-470-24766-2

In addition to this book, please be aware that some of the lecture material is also derived from the following sources:

1. B Buchanan, W Gruissem, R Jones, eds. (2015) *Biochemistry & Molecular Biology of Plants, 2nd edition*. John Wiley & Sons
2. FP Gardner, RB Pearce, & RL Mitchell (1985) *Physiology of Crop Plants*. Iowa State University Press
3. R Hay & J Porter (2006) *The Physiology of Crop Yield 2nd ed.* Blackwell Publishing
4. P Scott (2008) *Physiology and Behaviour of Plants*. John Wiley & Sons
5. L Taiz, E Zeiger, I Møller, & A Murphy (2017) *Plant Physiology & Development 6th ed.* Sinauer Associates.

Grades

Your final grade will be based on the percentage of total points you attained in the exams and homework assignments. There will be three exams, each worth 100 points and between 3 and 6 homework assignments that will be worth between 25 and 50 points each.

- **Exams-** Exam questions will be short answer and essays. I will only ask questions over material that we cover in lecture. I have posted the exams from last year as examples of the types of questions that I will ask. Please note some lecture topics have changed this year, so last year's exam should not be used as a study guide.
- **Study Guides** - I will post study guides on a regular basis; *these study guides form the test bank for the exams*. All exam questions (with the possible exception of extra credit questions) will be derived from the study guides. You will find it very useful to use the study guides in preparation for the exams.
- **Homework-** You will also be required to complete three to six homework assignments evenly spaced throughout the semester, each worth between 25 and 50 points. Each homework assignment will contain 1-4 questions from the study guides for the exams, *Think or Stink* questions and/or other short assignments that are meant to help with your understanding of the subject matter. I will provide more details about the submission of the homework questions later. Unless otherwise homework should *not* be considered group or collaborative assignments.
- **Curving** - Neither the exams nor the final grade will be curved.

Missed exams & late assignments

Make-up exams will be given only for a reasonable excuse. Accepted excuses are limited to personal illness, death in the family, or other problems beyond your control. You must inform me *within 24 hours* of a missed exam that you have a valid excuse. Under no circumstances will examination periods be extended beyond the 55 minutes and 105 minutes allotted for class or finals, respectively.

Grading scale

This course will be graded using the OSU Standard format:

93–100%:	A *	73–76%:	C
90–92%:	A-	70 –72%:	C-
87–89%:	B+	67 –69%:	D+
83–86%:	B	60 –66%:	D
80–82%:	B-	Below 60%:	E
77–79%:	C+		

*Grades less than xx.5% will be rounded down to the next whole percentage, while grades \geq xx.5 % will be rounded up to the nearest whole percentage.

Faculty feedback and response time

- **Grading and feedback** - For exams and homework assignments, you can generally expect feedback within seven days.
- **E-mail** - I will reply to e-mails within 24 hours on school days.

Attendance, participation, and discussions

Student participation requirements

The following is a summary of everyone's expected participation:

- **Attendance:** You are expected to attend all in-person class meetings, except for an emergency or illness. If you miss multiple classes due to an emergency or illness, please contact me as soon as possible.
- **Office hours:** If you wish to discuss an assignment or have questions about the lecture material or exams, please schedule an appointment through the HCS office manager, [Vivienne Patlovich](#).

Other course policies

Academic integrity policy

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's Code of Student Conduct (i.e.,

committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages ([COAM Home](#))
- *Ten Suggestions for Preserving Academic Integrity* ([Ten Suggestions](#))
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

Drop/Withdrawal Statement

It is the **student's responsibility** to know the deadlines for dropping a course or withdrawing from the University. Term drop & withdrawal deadlines can be found at:

<https://registrar.osu.edu>. If you receive financial aid or are supported by a GRA/GTA you should always talk with a financial aid specialist or your graduate studies coordinator prior to adjusting your schedule. If you stop attending a course but do not drop it, you risk receiving a failing grade which could negatively affect your GPA and your financial aid status.

Copyright Disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on Title IX

Ohio State is committed to providing a learning environment that promotes personal integrity, civility and mutual respect in an environment that is free from sexual misconduct and discrimination of any type. Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). Sexual discrimination violates an individual's fundamental rights and personal dignity. This refers to all forms of sexual discrimination including sexual harassment, sexual assault, and sexual violence.

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, [Kellie Brennan](#).

Accommodations for accessibility

Requesting accommodations

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential.

In addition to contacting the instructor, please contact the Office for Disability Services at 098 Baker Hall, 113 W. 12th Ave, Columbus, OH 43210 or by phone:

[614-292-3307](tel:614-292-3307) or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University.

Go to <http://ods.osu.edu> for more information.

Course schedule

Exam Schedule

Exam	Date	Lecture Material Covered	Points
Exam 1	September 27 (F)	Lecture material 8/21~9/25	100
Exam 2	November 1 (F)	Lecture material 9/30~10/30	100
Exam 3	December 9 (M) 10:00-11:45 AM	Lecture material 11/5~12/5	100

Lecture Topics

Unit I: Photosynthesis

Chapters 6, 7, & 8

1. Nature of light
2. Light reactions
3. Carbon (Dark) reactions
4. Environmental effects on photosynthesis
5. Canopy photosynthesis

Unit II: Respiration

Chapter 10

1. Glycolysis
2. Citric acid cycle
3. Electron transport
4. Efficiency of respiration
5. Fermentation/anaerobic respiration
6. Respiration and productivity

Unit III. Water Relations

Chapters 1 & 2

1. Physical & chemical properties of water
2. Water potential
3. Cohesion tension model of water transport
4. Transpiration
5. Environmental control of transpiration

Unit IV. Photomorphogenesis

Chapter 22

1. Photoreceptors
2. Shade avoidance response
3. End-of-day responses
4. Light stress

Unit V. Transport & Fate of Assimilates*

Chapter 9

1. Pressure flow model of assimilate transport
2. Assimilate partitioning
3. Xenobiotic transport

* If time permits