

PISc 401 Plant Physiology (3 cr)
Spring 2022

Instructor: Dr. Zonglie Hong
Contact Info: Office: Ag Biotech 207; Phone: 208-885-5464; email: zhong@uidaho.edu
Office Hours: Monday, 9:20-11:00 am and by appointment

Lecture time: Monday, Wednesday and Friday, 8:30-9:15 am pst
Classroom: TLC 222
Prerequisite: PISc 205 Botany or by permission.
Zoom link: <https://uidaho.zoom.us/j/921941527>

Catalog Description: “Application of physiological principles to the management of plants in agronomic, horticultural, and forest systems.”

Learning Outcomes:

1. Define, describe and identify plant morphological and physiological events related to growth and development.
2. Explain and generalize plant physiological events related to crop yield and quality characteristics.
3. Explain and demonstrate environmental influences on plant growth, development and crop yield/quality.

UI Learning Outcomes:

1. Think and Create - Use multiple thinking strategies to examine real-world issues, explore creative avenues of expression, solve problems and make consequential decisions.
2. Communicate - Acquire, articulate, create and convey intended meaning using verbal and non-verbal methods of communication that demonstrate respect and understanding in a complex society.

Students will think and communicate about issues in plant physiology, as they related to the individual and the community.

Required textbook: L. Taiz, E. Zeiger, I.M. Møller and A. Murphy. *Fundamentals of Plant Physiology*, 2018, First Edition, Oxford University Press (Sinauer Associates), ISBN 978-1605357904
In addition to the text, additional reading assignments may be required from other resources selected by the instructor. This material will be made available to you in a timely fashion.

Exams and Grading: There be 4 exams. All exams will be close-book! You may not bring your text, handouts and notes to exams. 4 Exams @ 100 points each; Total = 400 points

A = $\geq 90\%$ (360 points)

B = 80-89% (320 points)

C = 70-79% (280 points)

D = 60-69% (240 points)

F = $\leq 59\%$

Makeup exams will only be given *when prior arrangements are made* with the instructor. In the event an exam will be missed due to illness or inclement weather, (or dying relatives, etc.), an attempt should be made to contact the instructor prior to the scheduled exam time.

PISc 401 Plant Physiology – Lectures & Readings

List of PISc 401 lectures:	Chapters	Date (Day)
1. Introduction – Why study physiology	Ch. 1	01/12 (W)
2. Plant and Cell Architecture	Ch. 1	01/14 (F)
(01/17 Monday; Martin Luther King, Jr. Day)		
3. Plant and Cell Architecture	Ch. 1	01/19 (W)
4. Water Potential	Ch. 2	01/21 (F)
5. Water Balance	Ch. 3	01/24 (M)
6. Transpiration	Ch. 3	01/26 (W)
7. Mineral uptake & Essential nutrients	Ch. 4	01/28 (F)
8. Mineral uptake & Essential nutrients	Ch. 4	01/31 (M)
9. Mineral & Solute Transport	Ch. 4	02/02 (W)
10. Mineral & Solute Transport	Ch. 4	02/04 (F)
Review 1		02/07 (M)
Exam 1		02/09 (W)
11. Nitrogen Assimilation	Ch. 5	02/11 (F)
12. Mycorrhizal Symbioses		02/14 (M)
13. Light Harvesting and Photosystems	Ch. 7	02/16 (W)
14. NADPH and ATP Synthesis	Ch. 7	02/18 (F)
(02/21 Monday; Presidents' Day)		
15. Carbon Reactions	Ch. 8	02/23 (W)
16. Rubisco, C4 metabolism & CAM	Ch. 8	02/25 (F)
17. Ecological Effects on Photosynthesis	Ch. 9	02/28 (M)
18. Translocation in the Phloem	Ch. 10	03/02 (W)
19. Respiration in Plants	Ch. 11	03/04 (F)
20. Lipid metabolism	Ch. 11	03/07 (M)
Review 2		03/09 (W)
Exam 2		03/11 (F)
(Spring recess week)		
21. Auxins	Ch. 12	03/21 (M)
22. Cytokinins	Ch. 12	03/23 (W)
23. Gibberellins	Ch. 12	03/25 (F)
24. Abscisic Acid	Ch. 12	03/28 (M)
25. Ethylene	Ch. 12	03/30 (W)
26. Brassinosteroids	Ch. 12	04/01 (F)
27. Jasmone	Ch. 12	04/04 (M)
28. Salicylates	Ch. 12	04/06 (W)
29. Strigolactones	Ch. 12	04/08 (F)
Review 3		04/11 (M)
Exam 3		04/13 (W)
30. Red, Blue Light & Circadian Rhythm	Ch. 13	04/15 (F)
31. Seed Germination	Ch. 15	04/18 (M)
32. Seed Dormancy	Ch. 15	04/20 (W)
33. Flower Development	Ch. 17	04/22 (F)
34. Pollination & Fruit Development	Ch. 17	04/25 (M)
35. Biotic Stress	Ch. 18	04/27 (W)
36. Abiotic Stress	Ch. 19	04/29 (F)
37. Growth Scales – Potato & Grains		05/02 (M)
Review 4		05/04 (W)
Exam 4	TLC 222	8:00-10:00 am
		05/06 (F)

A few suggested references:

- Buchanan, B.B., W.G. Gruissem, R.L. Jones. Biochemistry & Molecular Biology of Plants. Wiley. 2000.

- Fitter, A.H. and R.K.M. Hay. Environmental Physiology of Plants. Academic Press. 1987.
- Gardner, F.P., R.B. Pearce and R.L. Mitchell. Physiology of Crop Plants. Iowa State University Press. 1985.
- Hale, M.G. and D.M. Orcutt. The Physiology of Plants Under Stress. John Wiley and Sons. 1987.
- Hay, R.K.M. and J.R. Porter. The Physiology of Crop Yield, 2nd edition. Wiley-Blackwell. 2006.
- Hay, R.K.M. and A.J. Walker. An Introduction to the Physiology of Crop Yield. John Wiley and Sons. 1990.
- Tesar, M.B. Physiological Basis of Crop Growth and Development. American Society of Agronomy. 1984.

Center for Disability Access and Resources Reasonable Accommodations Statement

Reasonable accommodations are available for students who have documented temporary or permanent disabilities. All accommodations must be approved through the Center for Disability Access and Resources located in the Bruce M. Pitman Center, Suite 127 in order to notify your instructor(s) as soon as possible regarding accommodation(s) needed for the course. Phone: 208-885-6307; Email: cdar@uidaho.edu; Website: www.uidaho.edu/current-students/cdar

University of Idaho Classroom Learning Civility Clause

In any environment in which people gather to learn, it is essential that all members feel as free and safe as possible in their participation. To this end, it is expected that everyone in this course will be treated with mutual respect and civility, with an understanding that all of us (students, instructors, professors, guests, and teaching assistants) will be respectful and civil to one another in discussion, in action, in teaching, and in learning. Should you feel our classroom interactions do not reflect an environment of civility and respect, you are encouraged to meet with your instructor during office hours to discuss your concern. Additional resources for expression of concern or requesting support include the Dean of Students office and staff (5-6757), the UI Counseling & Testing Center's confidential services (5-6716), or the UI Office of Human Rights, Access, & Inclusion (5-4285).

University of Idaho Suggested Syllabus Language Addressing Concealed Carry of Firearms

The University of Idaho bans firearms from its property with only limited exceptions. One exception applies to persons who hold a valid Idaho enhanced concealed carry license, provided those firearms remain concealed at all times. If an enhanced concealed carry license holder's firearm is displayed, other than in necessary self-defense, it is a violation of University policy. Please contact local law enforcement to report firearms on University property.

In-person Class Attendance:

Refrain from attending class in-person if you are ill, if you are experiencing any of the [known symptoms of coronavirus](#), or if you have tested positive for COVID-19 or been potentially exposed to someone with COVID-19.

- If you display symptoms and/or test positive, you should quarantine following the [CDC's recommendations](#). Do not return to class until you meet the [CDC's requirements](#).
- If you have been exposed but are asymptomatic, you should stay home for 14 days from the last exposure if you remain asymptomatic, adhering to the [CDC's requirements](#).

Documentation (*a doctor's note*) for medical excuses is not required; instead, make arrangements to submit any missed work and make plans to use Zoom and/or online course materials to stay current with the course schedule.

Face Covering Requirements:

All faculty, staff, students and visitors across all U of I locations must use face coverings over the nose and mouth whenever in any U of I buildings. **Thus, you are required to wear a face covering in this classroom at all times.**

- If you have a medical condition that affects your ability to comply with the face covering policy, please contact the [Center for Disability Access and Resources \(CDAR\)](#) to request a reasonable accommodation.
 - If you have other reasons you believe make you exempt from wearing face coverings, please contact the [COVID-19 Coordinator](#).
 - Failure to wear a face covering over your nose and mouth will require you to leave the classroom. If a disruption to the learning experience occurs due to repeated offence and/or egregious behavior, you will be reported to the [Dean of Students Office](#) for a potential code violation.
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