

BIOL 221, Concepts of Botany, Spring 2020

**Web:** <http://herbarium.millersville.edu/hardy.php>

**Lecture** Roddy 261: T R, 2:35-3:50  
**Labs** Roddy 279: A, M 1:00-3:50 (Hardy) B, T 9:00-11:50 (Hardy)  
 C, W 1:00-3:50 (Hardy)  
**Botany Open Lab** Roddy 279 R 4-6

**Lecture Instructor** Dr. Christopher Hardy  
 Office: Roddy 271 Tel: 871-4317 Office Hrs: M & W 9:30-10:30, R 10-1

**Required Text:** Hoefnagels M. 2018. *Biology: Concepts and Investigations*, 4<sup>th</sup> edition. McGraw Hill Education New York, USA.  
 Option 1: Custom Looseleaf Edition available on campus (ISBN13: 9781307185621)  
 Option 2: The entire bound-book, hardcover (ISBN13: 9780078024207)  
 Option 3: The entire ebook (ISBN13: 9781259869587, 6-month access).

**Other Materials:** 1. Required Lab Manual: Hardy CR, RL Wagner (eds). 2020. *Guide to Lab Exercises in Concepts of Botany*, 8<sup>th</sup> (Spring 2020) edition. Millersville, Pennsylvania, USA.  
 2. Required: Scientific calculator.  
 3. Optional: Rushforth et al. 2017. *A Photographic Atlas for the Botany Laboratory*, 7<sup>th</sup> edition. Morton Publishing.

**Schedule**

<u>Lecture Topic</u>	<u>Lab (subject to change)</u>
<b>Structure &amp; Development</b>	
Week of Jan 20: Introduction (Banack et al. 2006. <i>J Ethnopharmacology</i> 106: 97-104)	Introduction to Botany
Week of Jan 27: The Primary Plant Body (Hfn Ch22,24.2E; Rshf 163; LM 1-10,19-64)	Seeds & Seedlings
Week of Feb 03: The Primary Plant Body	Morphology
Week of Feb 10: The Secondary Plant Body (Hfn Ch22.1,22.4; Rshf 131-132,134-140; LM 65-78)	Anatomy
Week of Feb 17: Plant Modifications (Hfn Ch22.1,Fg22.3; Rshf 130,134,148-149; LM 85-90)	Woody Plants
<b>Physiology &amp; Function</b>	
Week of Feb 24: Water & Nutrition (Hfn Ch23; LM 99-100) <b>Exam 1 (Thu, Feb 27)</b>	Plant Modifications & Marketplace Vegetables
Week of Mar 02: Hormones & Tropisms (Hfn Ch24.4-24.7; LM 135)	Water in Plants
Week of Mar 09: Photosynthesis (Hfn Ch5 & p.384; LM 113-114)	Plant Behavior
Week of Mar 16: Spring Break	Spring Break
Week of Mar 23: Secondary Metabolites & the Case Study of Caffeine & Coffee (Hfn 379,460-461)	Photosynthesis
<b>Diversity &amp; Evolution</b>	
Week of Mar 30: Introduction to the Plant Kingdom (Hfn Ch19.1) Gymnosperms (Hfn Ch19.4; Rshf Ch8; LM 169-176)	Ethnobotany of 2° Metabolism
Week of Apr 06: Angiosperms:Flowers (Hfn 496-505; Rshf 151-171; LM 179-200) <b>Exam 2 (Thu, Apr 09)</b>	Gymnosperms
Week of Apr 13: Angiosperms: Fruits (LM 217)	Angiosperms: Flowers
Week of Apr 20: The Bryophytes & Pteridophytes (Hfn 380-387; Rshf Ch6,Ch7; LM 219-231)	Angiosperms: Fruits
Week of Apr 27: Algae (Hfn Ch18.2) Pollination Ecology (Hfn Ch19.5)	Bryophytes & Pteridophytes
Week of May 04: Final Exam: <b>Fri, May 8, 12:30-2:30 PM</b>	

**Reading Assignments** Listed in this syllabus (above) and supplemental readings will be announced in class as necessary. You are responsible for all content in the assigned readings.

**Grading** A point system is employed. Final letter grades are determined based on the percentage of total possible points you earn as follows (A = 93-100%; A- = 90-92; B+ = 87-89; B = 83-86; B- = 80-82; C+ = 77-79; C = 73-76; C- = 70-72; D+ = 67-69; D = 63-66; D- = 60-62; F = below 60%).

Lecture Exam 1	50	No make-up exams.
Lecture Exam 2	50	
Final Lecture Exam	75	
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Lab	150 (scaled, as needed, from your lab instructor's points)	
Total points possible	325	

**Objectives** At the successful completion of BIOL 221 lecture, a student should be able to

1. Understand the organization in plants from the cellular to tissue to organ to organism level.
2. Compare and contrast the life cycles of plants and animals.
3. Understand basic plant metabolism, including Electron Transport, and the Light and Dark Reactions of Photosynthesis.
4. Understand specific aspects of internal transport in plants including diffusion, osmosis, the Cohesion-Tension Theory, transpiration, translocation, and turgor pressure.
5. Understand and describe the mechanisms controlling plant behavior to light, gravity, touch, wounding and regeneration, and to flowering.
6. Recognize salient features and diversity within and between major plant taxa, and to develop a lineage of features from plesiomorphic to derived groups of plants.
7. Explain how the biology, anatomy, and structures of plants relate to their uses by humans.
8. Understand basic processes in the production of food, shelter, medicines, from plants.
9. Understand the role of plants in important societal issues.

**Special Needs** Please let me know if you have any disabilities or special needs that might affect your performance in this course. I will do my best to accommodate you.

**Attendance** Attendance is expected for all lectures and labs. No make-up exams or quizzes will be given for unexcused absences. Excused absences in lab must request permission prior to class and you will be expected to arrange to complete the lab in another lab section. Whenever possible, plan in advance. See the Millersville University attendance policy for qualifying excused absences.

**Honesty** Each student is expected to adhere to the Millersville University's Academic Honesty Policy. Violation of it results in a zero for the assignment. The policy can be found in the Student Handbook and the Academic Honesty and Dishonesty brochure (<http://www.millersville.edu/catalogs/undergraduate/index.pdf>)

**Title IX** Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment, comply with Title IX of the Education Amendments of 1972, 20 U.S.C. §1681, et seq., and act in accordance with guidance from the Office for Civil Rights, the University requires faculty members to report to the University's Title IX Coordinator incidents of sexual violence shared by students. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report to the person designated in the University Protection of Minors policy incidents of sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred.

Information regarding the reporting of sexual violence, and the resources that are available to victims of sexual violence, is available at <http://www.millersville.edu/sexualviolence/index.php>.

**Appendix 1. Guide to reading primary literature**

Occasionally you will be asked to read research articles published in scientific journals. Such literature is referred to as the “primary literature” because it is where new facts and new information is published for the first time. In contrast, textbook chapters and encyclopedia articles, however useful, are not part of the primary literature because they are merely reviews of what is already known on various topics and do not present new facts or new information. Primary literature is thus the life-blood of science and scholarship. Below are guidelines on how to extract and retain what is important from such articles.

1. Read the article in its entirety.
2. To facilitate discussion of the article in class or amongst your peers, be able to refer to the article by author (short-form) and year: e.g., “Smith (2016)” or “Gomez & Smith (2014)” or “Banack et al. (2006)”. Note that “et al.”, which is a Latin abbreviation for “et alia” meaning “and others”, is used when there are three or more authors. Sometimes you’ll find “et al.” italicized when in written form, but that is a preference only in style.
3. Be able to recall the journal that the article appeared in: e.g., *Journal of Ethnopharmacology*.
4. Many people use a highlighter pen to highlight important points made in the article. Better yet, record the following information on a separate sheet a paper and attach it to the article:
  - a. Make note of the species(s) studied and of the general aspects of the methods.
  - b. List the authors’ conclusion(s) and be able to reference specific experiments, data, and tables or figures that contain the evidence supporting each conclusion.
  - c. Be familiar with the components and purpose of each table and figure presented by the authors.