

Plant Anatomy

PISci 4400/7400 and BioSci 4400/7400

Fall, 2011

Course Description: Comparative structure, growth of meristems; development, structure of important cell types, tissues, tissue systems; comparative anatomy of stem, root, leaf. Emphasizes anatomy of gymnosperms, angiosperms. Includes lab. **Prerequisite:** BIO SC 1200 or 1500 or PLSCI 2125. 4 credits.

Text: Dickison, W.C. 2000. Integrative Plant Anatomy. Harcourt Academic Press

Schedule: Lectures – Monday & Wednesday 9:00-9:50 am, 200 Waters Hall

Labs – Wednesday & Friday, 1:00-2:50 pm, 40 Mumford Hall

Instructor: Dr. Jeanne Mihail, 111B Waters Hall, phone: 882-0574, mihailj@missouri.edu

Wk	Date	Lecture topic	Reading	Date	Lab topic
1		Class mechanics; plant organization	3-12		
		Cell protoplast	14,30-39		Microscopes; technical drawing
					Hand sections; peels; stains
2		Cell protoplast/cell wall			
		Cell wall	13-29		Protoplast
					Cell wall; Quiz
3		<i>No class – Labor Day</i>			
		Shoot apex, angiosperms	51-56, 62-66		Cell wall
					Shoot apex; Quiz
4		Tissue; dermal system	66-73		
		Tissue; parenchyma, collenchyma	74-78		Epidermis; stomata
					Parenchyma; Quiz
5		Tissue; sclerenchyma, sclerids, fibers	79-84; 399-402		
		Tissue; laticifers; rubber; review	85-86		Collenchyma; sclerenchyma
					Laticifers; Quiz
6		Exam 1 (blue book required)			
		Tissue: xylem	86-93		Instructor & grad presentations
					Xylem
7		Tissue: phloem	93-102		
		Vascular differentiation	102-116		Phloem
					Vascular differentiation; Quiz; grad presentation
8		Stem organization	121-128		
		Leaf organization	129-142		Stem organization
					Leaf organization; Quiz

Wk	Date	Lecture topic	Reading	Date	Lab topic
9		Sun and shade leaves	297-311		
		Root organization	57-62;142-150		Sun and shade leaves; grad presentation
					Root organization; Quiz
10		Roots & symbionts	150-155		
		Secondary growth, vascular cambium	161-173		Roots & symbionts
					Vascular cambium; Quiz
11		Exam 2 (blue book required)			
		Secondary xylem, wood	178-184; 406-411		Instructor & grad presentations
					Secondary xylem, wood
12		Secondary phloem & cork	185-195		
		Secondary growth, roots			Secondary phloem & cork
					Secondary root growth; Quiz
13		Secondary growth, monocots	195-198		
		Floral anatomy, angiosperms	237-240		Secondary growth, monocots
					Floral anatomy, angiosperms; Quiz
– No Class during Break					
14		Floral anatomy; gymnosperms			
		Fruit & seed anatomy; dicots			Floral anatomy, gymnosperms
					Dicot fruits & seeds
15		Fruit & seed anatomy; monocots			
		Review			Monocot fruits & seeds; Quiz
					<i>No Class</i>
F		Exam 3 (blue book required)			

Other Important Resources:

1. Crang, R. and Vassilyev, A. 2003. Plant Anatomy. McGraw-Hill. CD of images. This will be available in lab.
2. Evert, R.F. 2006. Esau's Plant Anatomy. 3rd ed. Wiley-Interscience.
3. Raven, P.H., Evert, R.F., and Eichhorn, S.E. 2005. Biology of Plants, 7th ed. W.H. Freeman & Co.

Assignments & Grading:

All Students:

1. 3 written exams (as noted in syllabus; 100 pt each) – 300 points total
2. Lab drawings (due at the end of lab; 5 pt per lab) – 130 points total
3. "Show Me" open book lab quizzes (10 pt each) – 110 points total

Graduate Students:

Each graduate student will be required to create and present a 25 minute Power Point mini-lecture on a topic relating plant anatomy to real-world applications. The presentation will be worth 50 points. *All*

students will be expected to attend all presentations. Each student will prepare one question for the presenter to be given to the presenter at the end of the presentation. Graduate students will have one week to prepare written (typed) responses to questions posed. Graduate students will give a copy of questions and answers to the instructor for grading, after which the instructor will return the question and the response to the originator of the question. The preparation of written answers will be worth 25 points.

Presentation Topics and Associated Readings:

1. To be presented by instructor
 - a. The importance of pits in Dutch Elm Disease (pg. 371, 373-375)
 - b. Dendrochronology and the ergot disease of rye (pg. 439-446)
2. Topics available for graduate student presentations:
 - a. Plant anatomy and environmental pollution (pg. 324-331)
 - b. Variety and function of plant trichomes (pg. 347)
 - c. Wounding and plant response to disease (pg. 359-368)
 - d. Virus movement in plants (pg. 376-378)
 - e. Secretory structures and rubber production (pg. 384-387)
 - f. Plant fibers in pulp and paper production (pg. 399-406)
 - g. Plant fiber and animal nutrition (pg. 410-416)
 - h. Wood and the creation of musical instruments (pg. 485-492)
3. Student-selected top (with instructor approval)

Topic Selection: Each presentation must be on a unique topic. Topic selection will be approved on a first-come, first-serve basis. Similarly, requests for a specific presentation date will be made on a first-come, first-serve basis. Graduate students who have not selected a presentation date by the end of the 4th week of class will have one assigned for them based on a random selection of names.

Grading Scale:

Undergraduate grade scale		Graduate grade scale	
98-100%	A+	90-100%	A
93-97%	A	80-89%	B
90-92%	A-	70-79%	C
87-89%	B+	< 70%	F
83-86%	B		
80-82%	B-		
77-79%	C+		
73-76%	C		
70-72%	C-		
67-69%	D+		
63-66%	D		
60-62%	D-		
< 60%	F		

Policy on Late Assignments: Turning in assignments late will result in reduced credit. For each day that an assignment is late, 10% of earned credit will be deducted. Saturdays and Sundays are included.

Policy on Cell Phones: As a courtesy to fellow students and the instructor, all cell phones must be in the vibrate or off mode during lecture and lab periods. If you must answer a phone call, you must leave the room without disturbing others and conduct your personal business outside the classroom.

University of Missouri Policy on Academic Honesty: Academic honesty is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person's work has been responsibly and honorably required, developed, and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards academic dishonesty as an extremely serious matter, with serious consequences that range from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult the course instructor.

The University has specific academic dishonesty administrative procedures. Although policy states that cases of academic dishonesty must be reported to the Office of the Provost for possible action, the instructor may assign a failing grade for the assignment or a failing grade for the course, or may adjust the grade as deemed appropriate. The instructor also may require the student to repeat the assignment or to perform additional assignments.

Assisting Students with Special Needs: If you need accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please inform me immediately. You may see me after class or in my office (111B Waters Hall).

To request academic accommodations (for example, a note-taker), students must also register with Disability Services (AO38 Brady Commons, 882-4696. Disability Services is the campus office responsible for reviewing documentation provided by students requesting academic accommodations, and for accommodations planning in cooperation with students and instructors, as needed and consistent with course requirements.