BOT4935 Plant Anatomy

Fall, 2016
Blended lecture/lab: MT periods 5 – 8 (11:45 – 3:50), Rolfs 114

Instructor s
Dr. Christine Davis
Christine.davis@ufl.edu
Carr Hall 614
Office hours: immediately before class and by appointment

Ms. Sarah Allen
sa4393@ufl.edu
Dickinson Hall
Office hours: by appointment

Why is learning plant anatomy important? Plant anatomy is situated between the study of plant morphology and cell biology. Studying plant anatomy allows a student to conceptually integrate organismal structure and function. Further, it helps to reveal the relationships between structure, function, taxonomy, ecology, and developmental genetics.

Our course aims to help students understand
1) The arrangement of tissue and cells types within the dermal, ground, and vascular tissue systems in vascular plants;
2) The characteristics of specialized cells and their components;
3) The relationship between internal structure, physiology, and ecology;
4) Evolutionary history and taxonomic variation of vascular plant anatomy;
5) The genetics and process of vascular plant development.

Further, our course will help you develop skill with
1) Experimental design and hypothesis testing;
2) Microscope techniques;
3) Oral and written presentation of your own work.

Specific learning outcomes
After you have completed this class, you will be able to:
1) Discuss the structural components of plant cell walls and membranes;
2) Compare and contrast the characteristics of plastid types;
3) List and describe the anatomy and ecological significance of epidermal and secretory structures;
4) Compare, contrast, draw, and describe the taxonomic and evolutionary variation in xylem and phloem components;
5) Outline and describe current understanding of the components of shoot, root, and floral development, including gene expression, tissue differentiation, and growth;
6) Outline and describe the process of woody secondary growth in stems;
7) Draw, identify, and describe stelar patterns in stems and roots of vascular plants with and without secondary growth;
8) Draw, identify, and describe leaf anatomy and leaf adaptations associated with specific habitats;
9) Describe and give examples of the practical use of plant anatomy in wood technology, archaeology, forensics, and paleontology;
10) Design, carry out, and present a laboratory study in plant anatomy.

Recommended preparatory courses
Although this course has no explicit prerequisites, it is intended for upper-level undergraduate or graduate students in botany and plant science. It will be assumed that students have a basic understanding of plant morphology, diversity, phylogeny, ecology, and physiology.

Texts
Esau, Katherine. ***Anatomy of Seed Plants***. 2nd edition. John Wiley and Sons.
Allen, Sarah et al. Fall 2016. ***Plant Anatomy Lab Manual***. Available from Target Copy.

Course grades will be determined as follows:

4 exams @ 100 pts each	= 400 pts	~57%
10 lab quizzes @ 20 pts each	= 200 pts	~29%
1 lab project/symposium	= 100 pts	~14%
Total course points	= 700	

Grading scale:
90 – 100% = A
80 – <90% = B
70 – <80% = C
60 – <70% = D
below 60% = E

Exams
Four exams will be given according to the schedule at the end of the syllabus. The exams will require drawing, labeling, and short and long written answers. The exams are not cumulative.

Laboratory
Your laboratory grade will be based upon 10 lab quizzes and your lab project and its presentation in a course symposium. Twelve lab quizzes will be given, but only the 10 top scores will be counted toward your grade. Please see your lab instructor for details concerning preparation for the lab quizzes. Details regarding the lab project and symposium will be provided as the time approaches.

Course attendance, curves, and make up policy
Attendance is required and essential for success in this course. I understand that absences happen, but if you make this a habit, you are guaranteed to perform poorly. There will be NO curve applied to grades. If you have a **valid documented excuse and notify us in advance**, you may be able to make up missed quizzes or exams. We will determine this on an as-needed basis.

Policy on electronic devices
Use them if you want, but if they become distracting to your classmates, you will be asked to leave. Also, please note that the use of devices for socializing during class is very obvious to your classmates and your instructors. We'll make a mental note of it as disrespectful, and it leaves a negative impression.

UF counseling services
Resources are available on campus for students having personal problems or lacking clear career and academic goals. The resources include:
UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
Career Resource Center, Reitz Union, 392-1601, career and job search services.
Many students experience test anxiety and other stress – related problems. "A Self Help Guide for Students" is available through the Counseling Center (301 Peabody Hall; 392-1575) and at their web site: http://www.counsel.ufl.edu/.

Academic Honesty Policy
All students registered at the University of Florida have agreed to comply with the following statement:

> "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."

In addition, on all work submitted for credit the following pledge is either required or implied:

> "On my honor I have neither given nor received unauthorized aid in doing this assignment."

If you witness any instances of academic dishonesty in this class, please notify the instructor or contact the Student Honor Court (392-1631) or Cheating Hotline (392-6999). For additional information on

Academic Honesty, please refer to the University of Florida Academic Honesty Guidelines at: https://catalog.ufl.edu/ugrad/current/advising/info/student-honor-code.aspx#honesty.

Important – Plagiarism

Plagiarism is a serious violation of the Student Honor Code. It includes:

- Submitting all or part of someone else's work as if it is your own
- "Borrowing" without crediting the source
- Submitting duplicate assignments
- Collaborating or receiving substantive help in writing your assignment unless we require such collaboration as part of the work
- Failing to cite sources, or citing them improperly

Consequences of plagiarism:

- Failing grade on assignment AND
- Course grade penalty of one letter grade AND
- Report to the Office of the Dean of Students.

Please review plagiarism and how to avoid it: http://web.uflib.ufl.edu/msl/07b/studentplagiarism.html

Accommodations for students with disabilities

Students who will require a classroom accommodation for a disability must contact the Dean of Students Office of Disability Resources, in Peabody 202 (phone: 352-392-1261). Please see the University of Florida Disability Resources website for more information at: http://www.dso.ufl.edu/drc/. Note that the student should provide documentation of a requirement for accommodation by the second week of classes. No accommodations are available to students who lack this documentation. It is the policy of the University of Florida that the student, not the instructor, is responsible for arranging accommodations when needed. Once notification is complete, the Dean of Students Office of Disability Resources will work with the instructor to accommodate the student.

		Lecture topic	Lab topic	Assignments due/lab quiz dates
Mon	22-Aug	Intro	1. Intro, Safety, Microscopes	Review plant morphology handout on your own
Tue	23-Aug	Plant cells, plastids	2. Hand sectioning and staining, microtome demo	**Lab Quiz 1**
Mon	29-Aug	Cell walls	3. Cells	
Tue	30-Aug	Primary simple tissues	4. Simple Tissues	**Lab Quiz 2**
Mon	5-Sep	No class - Labor Day	No class - Labor Day	
Tue	6-Sep	Complex primary tissues	5. Complex Tissues: xylem and phloem	
Mon	12-Sep	Primary growth /development of the shoot	6. Apical meristems	**Lab Quiz 3**
Tue	13-Sep	Secondary vascular tissue/growth of shoot	7. Secondary growth and vascular cambium	
Mon	19-Sep	**Exam 1**	Catch up session if needed; introduce project, initial brainstorm	
Tue	20-Sep	Stem, vascular bundle types, stelar patterns	8. Stems, stelar patterns, and vascular bundles of the stem	**Lab Quiz 4**
Mon	26-Sep	Secondary protective tissue/growth	Stems/Catch up session	**Lab project proposal with references due**
Tue	27-Sep	Anomalous secondary growth	9. Wood and pits	**Lab Quiz 5**
Mon	3-Oct	Secretory structures of the stem	Wood/Project time	
Tue	4-Oct	Ecological specializations of stem/wood and practical applications of stem/wood anatomy	Project time	**Lab Quiz 6**
Mon	10-Oct	**Exam 2**	Project time	
Tue	11-Oct	Leaf anatomy	10. Leaf Anatomy	**Lab project outline due**
Mon	17-Oct	Leaf specialization and secretion	Leaf Anatomy	**Lab Quiz 7**
Tue	18-Oct	Root anatomy, cell elongation, primary growth	11. Root anatomy, secondary meristems, and stelar patterns	
Mon	24-Oct	Root anatomy, primary/secondary growth	Root anatomy and meristem	**Lab Quiz 8**
Tue	25-Oct	Root specialization	Project time	**Lab Quiz 9**
Mon	31-Oct	**Exam 3**	Project time	
Tue	1-Nov	Reproductive and floral anatomy	12. Flower Anatomy	
Mon	7-Nov	Flower anatomy	Project time	**Lab project - one paragraph update and timeline due**
Tue	8-Nov	Pollen anatomy	13. Pollen, spores, and gametogenesis	**Lab Quiz 10**
Mon	14-Nov	Seed anatomy and embryogenesis	14. Seed Anatomy and embryogenesis	**Lab Quiz 11**
Tue	15-Nov	Fruit anatomy	15. Fruit Anatomy	
Mon	21-Nov	Gametogenesis and fertilization	Project time	**Lab Quiz 12**
Tue	22-Nov	Evolution of development	Project time	
Mon	28-Nov	Evolution of development	Project time	
Tue	29-Nov	**Exam 4**	Project time	
Mon	5-Dec	Project symposium	Project symposium	
Tue	6-Dec	Project symposium	Project symposium	