

The Life of Plants: General Botany
Biol 115
fall 2003

Syllabus
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In this course, we will delve into the scientific study of plants. I am choosing three themes for this course, and most of them will be revisited each class. 1) plant structure and function. 2) plant phylogeny (= family tree, no pun intended) of plants, to explain various organ systems, tissues, etc., in their evolutionary context—i.e., what could be some selective advantages to organisms that possessed certain features? 3) forensic botany. We will explore these broad questions: What are plants? How did they evolve? What are the different types of plants, and how are they related? What roles do plants play in ecosystems? How are plants important to humans and other animals?

Major goals of this course include:

- developing an appreciation for living organisms
- developing an appreciation for larger current issues dealing with botany: habitat destruction, problems caused by invasive species, and pollution.
- understanding evolutionary relationships among plants
- appreciating contributions of botanical evidence used for solving crimes.

Lecture text: Uno, G., Storey, R., and Moore, R. 2001, Principles of Botany, McGraw-Hill

Lab Manual: Stern, Kingsley R., 2003. Introductory Plant Biology, Laboratory Manual, McGraw-Hill

Class/Lab meets: Thursdays 7:25-10:10 PM

Lab Instructions: Will be available on BIOL115 Lotus Notes Academic Discussion Group

Date/Date	Topic	Text pages and Lab Instructions
21 August Lecture	Introduction to the study of plants What is a plant (things all plants do)? Origin of plants	1-17 17-25, (314) 88, 386
28 August Lecture	Plant tissues Specialized plant tissues and Forensic Identification of the “last meal” The plant cell Functions of membranes Cell chemistry and macromolecules of cells	95-106 79-88 90-96 51-60 and 61-71 (71-78 optional) Scientific article 1: <i>Ginkgo biloba</i>
4 September Lab	The compound and stereoscopic microscopes Examination of plant cells and organelles <i>Elodea</i> (wet mount)	Stern, Labs 1 and 2

	Various cell types (prepared slides and wet mounts) Potato amyloplasts, Pear schlerids	
11 September Lecture	Evolution of plants Genetics of plants Diversity and classification of plants Cyanobacteria, Algae C3, C4, and CAM Photosynthesis Respiration in Plant Cells	327-354 299-326 355-380 395-408 231-254 255-264
18 September Lab	Photosynthesis—demonstration with spinach Cyanobacteria <i>Oscillatoria</i> , <i>Azolla</i> ferns (mutualisms with cyanobacteria) Chlorophyta – filamentous Green Algae <i>Spirogyra</i> (wet mount too) Chlorophyta – Colonial Green Algae <i>Volvox</i> (live) Other algae, including Chrysophyta – Diatoms (Yellow-green and Golden-brown Algae) Diatoms (structure and ID)	Stern Labs 10 and 14 Scientific article 2: Mystery of the Poisoned Expedition
25 September Lecture	Bryophytes (Mosses, Liverworts) and the problems of terrestriality Ferns and early vascular plants Evolution, ecology, and physiology of stems xylem and phloem, structure and function	409-422 422-438 181-188; 217-220
2 October Lab	Mosses (and Liverworts), Ferns, <i>Psilotum</i> (stem x.s. wet mount), Comparison of stems: (Prepared Slides) <i>Coleus</i> , <i>Helianthus</i> (dicot) x.s., <i>Zea mays</i> (monocot) x.s. Compare Pine, Oak, and <i>Cannabis</i> stems x.s. Leaf arrangement of <i>Photinia</i> twigs and <i>Zebrina</i> ID twigs using a dichotomous key	Stern Labs 5 and 16
9 October Lecture/Exam	Evolution of Leaves Leaf Structure and Organization Mid Term Exam	205-216
16 October	No class—fall break	

23 October Lab	<p>Leaf Structure and Modifications</p> <p>Leaf ID</p> <p>Leaf Venation <i>Coleus</i> and <i>Zebrina</i></p> <p>Leaf types (Prepared slides) Privet, corn, and pine x.s. <i>Ammophila</i> and <i>Nymphaea</i> x.s. <i>Cannabis</i> leaf x.s.</p> <p>Use dichotomous key to ID leaf types</p> <p>Leaf modifications (<i>Cannabis</i>) Some carnivorous plants (<i>Nepenthes</i>, <i>Sarracenia</i>)</p>	Stern Lab 6
30 October Lecture	<p>Gymnosperms</p> <p>Evolution, structure and function of roots</p> <p>Types of roots</p> <p>Stems revisited: Woody and secondary growth</p>	<p>439-454</p> <p>153-164</p> <p>165-170</p> <p>189-204</p>
6 November Lab	<p>Some specimens of Gymnosperms</p> <p>Roots: Filamentous versus tap roots</p> <p>Seedlings: root hairs</p> <p>Prepared slides: root hair origin, <i>Ranunculus</i> root, <i>Smilax</i> root, root with secondary growth</p> <p>Prepare and stain carrot root</p> <p>Root nodules on bean plants—mutualisms and Nitrogen</p> <p>1 and 3 year old <i>Tilia</i> stem x.s.</p>	Stern Labs 4 and 17
13 November Lecture	<p>Gymnosperms continued: evolution of seeds</p> <p>Gymnosperm pollination</p> <p>Intro to Angiosperms (flowering plants): Flowers</p> <p>Angiosperm pollination and embryo formation</p> <p>Fruits</p>	<p>439-454</p> <p>271-282</p> <p>278-291</p> <p>292-298</p>
20 November Lab	<p>Angiosperms</p> <p>Flowers and Fruits, pollination and seed dispersal</p>	Stern Labs 18 and 19 Scientific article 3
27 November	No class—Thanksgiving	
4 December Lecture	<p>Exploring the diversity of Angiosperms:</p> <p>Importance of plants</p> <p>Secondary plant chemistry</p>	<p>455-468</p> <p>71-78</p>

	Biodiversity, Ecology, Economics, etc. Review for final exam, as needed	479-495
6 December (Saturday!)	Final Exam 12:00 (noon) – 2:30 PM	

Office Hours

I live in Durham, so I will not be on Guilford campus much. Please feel free to

1. talk with me after class (with questions, or for clarification)
2. email me with questions you may have: tsf@duke.edu
3. email me or talk with me to schedule an appointment before class the following week.
4. stop by the Biology office (room 134) and try to find me before class—I should be there after 5 or 6 PM on Thursdays.

Grading Policies

Grades are given in five categories, summarized in the following table:

Grade	What should you do to get this grade?
A	Demonstrate a complete understanding of the material covered in the course, particularly as demonstrated in your assignments and exams. Be an active and well-prepared participant in class and lab.
B	Complete all work at an above average level of quality and understanding, or do almost everything that would earn an A, but with one area less strong, such as weak exam or lab reports.
C	Complete all work at an average level of quality and understanding, or show widely varying work (strong in one area and weak in another).
D	Have only the most basic understanding of the material covered in the course; miss some of the assignments even if you complete the others; don't participate in class.
F	Don't show up to class; don't turn in lab reports, etc., (or do so poorly on them that you are not demonstrating any understanding of the material); miss both exams; don't show any interest in the subject or in your performance in the course. (Note: if you appear to be going in this direction, you may want to drop the course.)

Your grade will be based mainly upon

Exams	(% of grade)
Midterm Exam: Thursday, 9 October, 8:40-10:10 PM	(30%)
Final Exam: Saturday, 6 December 12:00 (noon)-2:30 PM	(35%)
lab reports—drawings and answers to questions	(25%)
short pop quizzes	(5%)
journal article evaluation	(5%)

Exams

There will be two exams (see above) Questions on exams will be short answer, with one or two essays in addition.

How to study and prepare for exams:

Both the Guilford College Biology Department and I hope you succeed in this course, and know that you have the ability to do so. Here are some guidelines to help you learn the material. These should be useful to you as you prepare for exams as well.

1. Prior to class, read the assigned pages (text book or outside reading) for the topic that we will be covering in the lecture. I will follow the syllabus to the best of my ability, so you should always know what the next lecture or lab topics will be.
2. Attend all lectures. Ask questions!!! Be prepared to try and answer (or at least think about) questions I will pose during the class. In general, be prepared to participate actively in this class.
3. Take notes during the lectures. I try to distill the most important concepts relevant to these topics— this will hopefully help you while re-reading the relevant portions of the text.
4. Review these notes, and make sure you understand them. Try explaining the concepts to yourself, to other people in the class, or to friends, or enemies. If you can do this, you will be better able to explain yourself to me while writing an exam. **Please do not hesitate to ask me for clarification!!**
5. Make note cards to help you study the material. Review these cards during free time.

Procedures for taking exams

- All exams are to be taken as scheduled. Failure to take a scheduled exam will result in a grade of zero for that exam
- Legitimate excuses for missing an examination are defined in the Student Code Book and the Faculty Handbook. Make-up exams will only be given for legitimate excuses. A note saying that you visited the Infirmary is NOT a legitimate excuse. Medical excuses will only be accepted if your doctor specifically certifies that you are physically unable to take the exam.
- The instructor may remain in the exam room during the exam. **COME PREPARED.** Bring extra pens, etc.
- Exams are to be written in **BLACK INK** only!!
- Only materials specifically authorized by the instructor for this course may be utilized during the exam. Notes, drawings of chemical structures, reaction diagrams, etc., are not generally authorized. Tape recorders, etc., are not permitted.
- All exams will be collected promptly at the end of the exam period. If extensions of time are granted, you must precisely follow the instructions given.
- If the above procedures are not followed, the exam paper will not be accepted for grading and the student will be assigned a grade of zero for that exam.
- Provisional grades may only be given in strictly defined circumstances as set by the Dean's office. Students must discuss any request for a provisional grade with the instructor at least 7 days before exams begin.

Lab reports

Due at the beginning of the next scheduled lab period (nearly every two weeks).

Late lab reports will NOT be accepted for grading.

Lab reports are to be done **INDIVIDUALLY**. You may work in pairs or groups during the lab, but your responses to the questions must be unique and individual. Do not copy your partner's answers.

Assignments that do not follow the instructions on this page will not be accepted for grading and the student will receive a grade of zero for that piece of work.

Lab Reports should consist of:

1. Drawings: Fully labeled drawings of the slides and structures examined in the lab. Drawings are to be made using regular and colored pencils only—the colors in your drawings should match the colors you observe, more or less. Make your drawings large enough to see all the relevant details. Label all drawings (with the name, magnification (if using a microscope), and relevant parts of each specimen you are observing, be they tissue types, cell types, or larger organisms)! Make sure you draw arrows to each part labeled in the drawing, so I know what part you are naming.
2. Answers to Questions: You need to provide answers to the questions in the lab manual (or extra ones I give you). I may not assign all of the questions to you, so pay attention to which ones are assigned. You are expected to consult your textbook and lecture notes for assistance in answering the questions, where needed. Some of the questions will require that you provide a hypothesis based upon your observations and your knowledge of plant structure, function, and evolution.
3. Make sure your drawings and answers to questions are organized in order (drawings first, then questions, in order). Staple your lab reports!

Attendance policies

- Attendance at both lectures and laboratories is **required**. Students are expected to attend every class
- Students are expected to participate in class as appropriate
- Students are expected to be prepared for every class—i.e. reading assignments completed, written assignments completed.
- Students are expected to adhere to the due dates for assignments as given in the syllabus.

Students will incur the following grading penalty for unexcused absences:

- One point will be deducted from the final average for each unexcused absence. For example. If the final average is 88 (B+), but there are 6 unexcused absences, the grade will decrease to an 82 (B-)

Points lost due to unexcused absences canNOT be made up by extra credit work!

The college defines excused absences as:

- Sickness—a doctor’s note, or note from the infirmary that indicates that you were advised not to attend class
- Death in the Family—please provide appropriate supporting documentation
- Accident—please provide appropriate supporting documentation
- Personal Problems—can sometimes become overwhelming. Please speak to me in confidence, or provide documentation from a counselor.
- Required to appear I court—please provide appropriate supporting documentation

Oversleeping, forgetting that you had class, etc., **do not** qualify as excused absences!!!

Honor Code

The Guilford College Honor Pledge states, “I have not been dishonest, and I have not observed any dishonesty.” It is assumed that this pledge accompanies all work turned in for credit. The Student Code Book also defines the limits of specific activities such as Plagiarism. Use of Unauthorized Materials, Collaboration, etc. You are urged to consult the Code Book for specific regulations.

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Please be respectful in the class room/ lab room!!

Consider the following requests:

Be sure your shoes are relatively clean (not too muddy) before entering the room.

Do not put shoes on the furniture (desk tops, chairs, cabinets, etc.)

Do not pull out drawers to rest your feet—this destroys the tracking of the drawers.

Do not scratch or draw anything in or on the furniture/chairs/counter tops

Please erase things you write on the board by the end of class (if the ink dries on the board, it is difficult to remove).

Place broken glass, and disposable glass items in the *Glass Box*; **do not** place glass in a wastebasket where it might injure an unsuspecting housekeeper.

Clean up your lab desk—wipe it down if needed—at the end of the period.

Return equipment to its proper place when you are finished.

Always carry microscopes with both hands—they are really expensive pieces of equipment!

Always return your microscope to the preset positions before placing it in the cabinet.

Please remove all papers and other materials from the lab top (except perhaps for materials that were there at the beginning of lab).

If you have brought any recyclable items into the lab (glass or plastic water bottles, etc.), please recycle them—**do not** throw them in the wastebaskets!!

Do not remove equipment or supplies without my permission

If you receive permission to borrow something, make yourself personally responsible for letting me know that you have returned it.

I appreciate your consideration of all of these requests.

Thanks!

Tracy S. Feldman