

Syllabus: Principles of Plant Biology (BIOL 3306)

Dylan Schwilk

Fall 2023

Course Overview

Essentials:

Instructor Dylan Schwilk, Associate Professor, Biological Sciences

Room and time 11:00-11:50 MWF, Biology 102

Office hours Wednesday 2:00 – 3:00 PM in ESB II, at table outside room 409. I'm also happy to meet at other times, just ask via email.

Course Description

This course is a survey of the plant sciences including evolution and diversity, physiology, cell and tissue structure, metabolism, genetics, and ecology. By the end of the course you will have a conceptual map of plant diversity, develop knowledge about plant metabolism and energetics, understand the interrelationship between plant structure and function, and understand basic seed plant physiology. You also will gain an appreciation for the importance of plants in our increasingly interconnected world and what strange and wonderful organisms they are.

Required materials

- Textbook: Raven Biology of Plants, 8th edition. By Evert and Eichhorn. ISBN-13: 978-1429219617 You are welcome to purchase an earlier edition. There were only a few changes since the 7th. I am assigning readings largely by chapter.
- Course website: <http://biol3306.schwilk.org> For lecture notes
- Tophat: We will use Tophat for in class quizzes. TTU has a site license and it is therefore free for students. <https://app.tophat.com>
- I will use Blackboard for discussion threads and posting exam results and grades. <http://ttu.blackboard.com/>

Expected Learning Outcomes

The successful student will complete this course with a strong foundation in plant biology. At the completion of this course, students will be able to:

1. Describe plant anatomy and its relationship to plant function
2. Explain how basic plant functions are regulated by different plants

3. Examine a plant and make a classification by use of a dichotomous key. Be able to identify a plant to major phylogenetic group and within the flowering plants, be able to recognize the most common plant families.
4. Describe the anatomy and reproductive cycles of Angiosperms
5. Diagram the diversity of life histories and describe different mating strategies among plants
6. Describe basic plant physiological functions including photosynthesis, respiration, water transport, and nutrient acquisition
7. Understand broad ecological patterns among plants and their relationship to plant life history and physiology.
8. Communicate the ecological importance of plants in our biosphere and describe how plants contribute to ecosystem functions

Field trips and collection project

A portion of your grade is your plant collection project. You will learn to identify, collect, and press plant specimens. To help you with this, I will lead several field trips to local sites. You should plan to attend at least one of these and you will sign up for one during the first week of class. If you cannot make any of the scheduled times, you will need to schedule your own visits to suitable collection sites.

Link for details on the collection project and grading rubrik. http://biol3306.schwilk.org/handouts/collection_project.html

Grading and assignment weighting

- Exams (3): 70% (350 points across all three)
- Weekly quizzes (10): 10% (50 points, 5 points each)
- Collection Project: 20% of grade (100 points)

There will be occasional in-class pop quizzes that are purely extra credit.

Additionally, in each third of the course, your lowest quiz score will be added as extra credit to the exam for that section (midterm 1, midterm 2 or final). The details on the plant collection project are in a separate document. Grading framework: A => 90%; B => 80%; C 70%; D => 60%; F < 60%

Policies

Texas Tech Policies and required syllabus statements

Policies concerning Academic Integrity, Special Accommodations for Students with Disabilities, and Student Absences for Observance of Religious Holy Days may be found on Blackboard. These statements can also be found at <https://www.depts.ttu.edu/tlpdc/RequiredSyllabusStatements.php>

Attendance Policy

Attendance is required to perform well in this course. If you have a university function or illness that will cause you to miss an exam or quiz, contact Dr. Schwilk before the exam/quiz. In the case of a serious illness when no prior notice is possible, notify Dr. Schwilk as soon as possible and no later than 24 hours following the exam/quiz time.

Additional notes on honesty and academic ethics

It is the student's responsibility to conduct him/herself in a civil manner while in the classroom. Please consult the statement on Academic Integrity (<https://www.depts.ttu.edu/tlpdc/RequiredSyllabusStatements.php>) and the university operating policy on academic honesty (OP 34.12).

Cheating will not be tolerated. Any cheating (eg a student looking at another student's quiz or exam, electronic device out during exam, plagiarism or collusion) will result in immediate removal from the room and a written report submitting to the Office of Student Conduct and the chair of Biological Sciences.

Additional information, TTU resources

- Discrimination, harassment, and sexual violence - <https://www.depts.ttu.edu/tlpdc/DiscriminationHarrasmentStatement.pdf>
- Civility in the classroom - <https://www.depts.ttu.edu/tlpdc/CivilityInTheClassroomStatement.pdf>
- Plagiarism - <https://www.depts.ttu.edu/tlpdc/PlagiarismStatement.pdf>
- Student support - <https://www.depts.ttu.edu/tlpdc/StudentSupportStatement.pdf>
- Food insecurity - <https://www.depts.ttu.edu/tlpdc/FoodInsecurityStatement.pdf>

Course Outline

Date	Subject	Reading
8/25 F	Introduction to plants	Chapter 1
8/28 M	Plant cells	Ch 3 through p. 62
8/30 W	Plant tissues	Ch 23 through p. 544
9/1 F	Plant tissues / No quiz	Ch 23 pp. 544-end
9/4 M	HOLIDAY. No class.	
9/6 W	Introduction to plant ID	Ch 19 p 457-464
9/8 F	quiz #1 / Visit herbarium	Handout
9/11 M	Roots	Ch 24 through p. 570
9/13 W	Roots	Ch 24 pp. 570-end
9/15 F	Stems and primary growth / quiz #2	Ch 25 through p. 588
9/15 F	(2 PM) FIELD TRIP #1	
9/16 S	(9:30 AM SATURDAY) FIELD TRIP #2	
9/18 M	Leaves 1	Ch 25 pp. 588-598
9/20 W	Leaves 2	Ch 25 pp. 598-613
9/22 F	Secondary growth / quiz #3	Ch 26 through p. 626
9/25 M	Secondary growth II	Ch 26 pp. 626-635
9/27 W	Plant ID workshop 2	Handout
9/29 F	Exam 1 (through "Secondary growth II")	-
9/30 S	(9:30 AM SATURDAY) FIELD TRIP #3	
10/2 M	Phylogenies and origins of plants	Ch 12 to p 247, Ch 15 pp 345-358
10/4 W	Plant ID workshop 3 (cancelled)	Handouts
10/6 F	Bryophytes / quiz 4 and exam redo	Ch 16
10/9 M	Bryophytes cont. / phylogeny practice	Ch 16
10/11 W	Seedless vascular plants	Ch 17
10/13 F	Seed plants / quiz 5	Ch 18
10/16 M	Angiosperms / first project due	Ch 19
10/18 W	Flowers of Angiosperms	Ch 20 pp. 477-491
10/20 F	Angiosperm evolution / quiz 6	Ch 20 pp. 492-496
10/23 M	Fruits and seeds	Ch 20 p. 496 - end
10/25 W	Phylogeny practice	-
10/27 F	Exam 2 (through "Fruits and Seeds")	-
10/30 M	Photosynthesis 1 (light reactions)	Ch 7 p 135
11/1 W	Photosynthesis 2 (carbon fixation)	Ch 7 to 135
11/3 F	Photosynthetic strategies / quiz 7	Ch 7
11/6 M	Water movement 1	Ch 30 to p 716
11/8 W	Water movement 2	Ch 30
11/10 F	Plant nutrition 1 GUEST / quiz #8	Ch 29
11/13 M	Plant nutrition 2 GUEST	Ch 29
11/15 W	Phloem and sugar transport GUEST	Ch 30
11/17 F	Mounting specimens / quiz #9	Ch 4 to p 82
11/20 M	Plant hormones	Ch 27 to p 653
11/22-26	THANKSGIVING BREAK	
11/27 M	Control of plant growth 1	Ch 28 to p 664
11/29 W	Control of plant growth 2	Ch 28 p 665 and pp 668-674
12/1 F	Life history strategies / quiz 10, final project due	Handout
12/4 M	Plants and Fire	Handout
12/7 Th	Final 1:30 - 4:00	