

BIOL 4463: Plant Anatomy

Spring 2024 (4 credits)

Lecture: Bolin Hall, Room 209

Lab: Bolin Hall, Room 214

Instructor: Dr. Timothy J. Pegg, Assistant Professor, Department of Biology

Contact Information:

Office – Pierce Hall, Room 101

Email – timothy.pegg@msutexas.edu

Office Hours:

Mondays & Wednesdays, 1:00pm-3:00pm

Thursdays, 10:00am-11:45am

*Additional times by appointment

Lecture Class Times:

Mondays & Wednesdays, 10:00am-10:50am

Lab Class Times:

Thursdays, 12:00pm-1:50pm

Required Texts:

1. *Esau's Plant Anatomy: Meristems, Cells, and Tissues of the Plant Body: Their Structure, Function, and Development, 3rd Edition*, by Ray F. Evert
 - a. ISBN-13: 978-0471738435
2. *Anatomy of Seed Plants, 2nd Edition*, by Katherine Esau
 - a. ISBN-13: 978-0-471-24520-9

Course Description:

Plant Anatomy is an upper level course sequence designed for students majoring in the natural sciences or with an interest in botany. An examination of cells and tissues of the plant body will be conducted during this course with a focus on primary and secondary tissues; reproductive structures; sporogenesis, gametogenesis, and embryogenesis; secretory structures; and ecological plant anatomy.

Course Objectives:

1. Understand the functional and structural differences between plant tissues.
2. Identify subcellular structures within plant cells.
3. Describe differential developmental sequences resulting in plant tissue patterning.
4. Investigate phylogenetic specialization of vascular tissues.
7. Recognize the diversity of plant life and evolution through modification of cellular morphologies.

Course Policies:

Excused Absences

Email me at least 24 hours before a planned event or absence. You will be responsible for the work and material we cover in class. Final Exams will not be excused unless an extraordinary circumstance has occurred.

Absences Due to Co-Curricular Events or Religious Observances

Classes missed due to participation in college-sponsored co-curricular events or college-recognized religious observances are considered excused absences provided appropriate procedures are followed. The student must notify the instructor at the earliest possible time before the absence and arrange to make up missed work as defined by the instructor's syllabus.

Unexcused Absences

If a student has an unexcused absence from class on the day of an exam or quiz normally a make-up will not be allowed; however, the instructor may make exceptions under extraordinary circumstances. There will be no make-ups for missed quizzes.

Class Dismissal

The instructor may dismiss students from lecture and lab sections due to instances of significant disrespect, disruption, discriminatory or threatening behaviors. Return to class will be prohibited prior to meeting with the instructor to discuss the incident. A second instance of dismissal will result in permanent removal from the course and an automatic assignment of an "F" grade for lecture and lab. Immediate removal from the course and assignment of an "F" grade may result from severe instances of class syllabus or MSU College policy violations.

Desire-to-Learn (D2L)

D2L will be used as a means of communicating, as a location where you can access resources (ex. PowerPoints) that are required or useful for success in the course, and where you will submit some required work products. You can log into D2L through the MSU Homepage. If you experience difficulties, please use links to technical help found in the D2L site.

Tentative Grading Policy

| | | |
|--------------------|---|----------------------------|
| Quizzes | = | 20 points/ea. (220 total) |
| Lecture Exams | = | 100 points/ea. (300 total) |
| Final Exam | = | 150 points |
| Lab Assignments | = | 15 points/ea. (195 total) |
| Lab Midterm Exam | = | 100 points |
| Lab Practical Exam | = | 100 points |

Total Possible = 1,065 points

| Grading Scale | | |
|-------------------|---|----------|
| 90 - 100% | = | A |
| 80 - 89.9% | = | B |
| 70 - 79.9% | = | C |
| 60 - 69.9% | = | D |
| 0 - 59.9% | = | F |

Exams will cover materials from lectures and chapter readings. Material for the Final Exam will be drawn from previous exam question topics and chapters covered after comprehensive over the entire semester.

Quizzes will be posted to D2L at the end of each week and will be due within by the start of the subsequent lecture period.

Lab assignments will consist of handouts, written and/or verbal instructions provided by the professor. Completed lab assignments will be due by the start of subsequent lab period (submitted through D2L)

Two lab practical exams will be conducted during the semester. These exams will test your knowledge of plant structures, microscope usage, conceptual knowledge gained during lab.

Late Assignments

Late assignments will not be accepted unless prior approval is obtained by the instructor or teaching assistant(s). Exceptions may be made regarding extraordinary circumstances.

Extraordinary circumstances

In the case of extraordinary circumstances (documented medical emergency, natural disasters, etc.), the instructor reserves the right to resolve grading issues on an individual basis and in accordance with criteria stipulated in the 2021-2022 MSU Student Handbook.

Electronics in Class

Cell phones, computers and other electronic devices must be turned off in class unless prior permission has been obtained by the instructor, they serve as accommodation to an impairment or disability, or must remain active as a requirement for an occupation (EMT, another medical professional, etc.)

Student Expectations:

Students have responsibilities for achieving the course objectives. Learning is a process that requires skills and strategies, and you must actively develop those that work best for you. In this course the foundation of academic success includes:

- Attending lecture and lab sessions
- Reading the assigned material

- Submission of assignments in a timely manner
- Asking your professor (Dr. Tim Pegg) for assistance and clarification of topics when required

University Policies:

Campus Carry Rules/Policies

Effective August 1, 2016, the Campus Carry law (TX Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. The new Constitutional Carry law does not change this process. Concealed carry still requires a License to Carry permit, and openly carrying handguns is not allowed on college campuses. For more information, visit [Campus Carry](#).

Active Shooter Information

The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by MSU Police Department regarding the options and strategies we can all use to stay safe during demanding situations. For more information, visit [Safety / Emergency Procedures](#). Students are encouraged to watch the video entitled “*Run. Hide. Fight.*” which may be electronically accessed via the University police department’s webpage: [“Run. Hide. Fight.”](#)

Smoking/Tobacco Policy:

University policy prohibits the use of tobacco products in any building owned or operated by Midwestern State University. Adult students may smoke only in the outside designated-smoking areas at each location.

Alcohol and Drug Policy:

To comply with the Drug Free Schools and Communities Act of 1989 and subsequent amendments, students and employees of Midwestern State University are informed that strictly enforced policies are in place which prohibit the unlawful possession, use or distribution of any illicit drugs, including alcohol, on university property or as part of any university-sponsored activity. Students and employees are also subject to all applicable legal sanctions under local, state, and federal law for any offenses involving illicit drugs on university property or at university-sponsored activities. Please refer to the **2023-2024 Student Handbook** for further information.

Academic Dishonesty:

Dishonesty within the academic community is a profoundly serious matter because dishonesty destroys the basic trust necessary for a healthy educational environment. Academic dishonesty is any treatment or representation of work as if one were fully responsible for it when it is in fact the work of another person. Academic dishonesty includes cheating, plagiarism, theft, or improper manipulation of laboratory or research data or theft of services. A substantiated case of academic

dishonesty may result in disciplinary action, including a failing grade on the project, a failing grade in the course, removal from the course, and/or expulsion from Northwestern State University. Please reference the **2023-2024 Student Handbook** for additional information.

Services for Students with Disabilities

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Northwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make application for such assistance through **Disability Support Services**, located in the **Clark Student Center, Room 168, (940) 397-4140**. Current documentation of disability will be required in order to provide appropriate services, and each request will be individually reviewed. For more details, please go to Disability Support Services.

Grade Appeal Process

To appeal a grade, consult the Northwestern State University 2021-2022 Student Handbook and visit the following checklists: the [Grade Appeal Checklist](#) provides the timeline for appealing from the instructor to the next in line (dean of the college). The [Academic Honesty Checklist](#) describes the timeline for appealing from the instructor to the next in line (chair of department) and who must be notified of academic honesty infractions.

Tentative Lecture Schedule:

| Week | Day | Date | Topic | Ch. Assignment |
|-----------|----------|-------------|---|---------------------------------------|
| 1 | M | 1/15 | Martin Luther King's Birthday – No Class | ---- |
| 1 | W | 1/17 | Course Introduction & The Plant Body | Ch. 1 (Evert) |
| 2 | M | 1/22 | Protoplast – Part 1 | Ch. 2 (Evert), <i>Ch. 3 (Esau)</i> |
| 2 | W | 1/24 | Protoplast – Part 2 | Ch. 3 (Evert), <i>Ch. 3 (Esau)</i> |
| 3 | M | 1/29 | Cell Wall | Ch. 4 (Evert), <i>Ch. 4 (Esau)</i> |
| 3 | W | 2/31 | Meristems – Growth & Differentiation | Ch. 5 (Evert), <i>Ch. 2 (Esau)</i> |
| 4 | M | 2/05 | Apical Meristems | Ch. 6 (Evert), <i>Ch. 2 (Esau)</i> |
| 5 | M | 2/07 | Ground Tissues – Part 1 | Ch. 7, 8 (Evert), <i>Ch. 5 (Esau)</i> |
| 4 | M | 2/12 | Ground Tissues – Part 2 | Ch. 7, 8 (Evert), <i>Ch. 6 (Esau)</i> |
| 5 | W | 2/14 | Exam #1 | ---- |
| 6 | M | 2/19 | Epidermis | Ch. 9 (Evert), <i>Ch. 7 (Esau)</i> |
| 6 | W | 2/21 | Xylem: Cell Types & 1° Xylem | Ch. 10 (Evert), <i>Ch. 8 (Esau)</i> |
| 7 | M | 2/26 | Xylem; 2° Xylem & Wood Variation | Ch. 11 (Evert), <i>Ch. 9 (Esau)</i> |
| 7 | W | 2/28 | Vascular Cambium | Ch. 12 (Evert), <i>Ch. 10 (Esau)</i> |
| 8 | M | 3/04 | Phloem – Cell Types & Primary Phloem | Ch. 13 (Evert) <i>Ch. 11 (Esau)</i> |
| 8 | W | 3/06 | Phloem – Ontogenesis and 2° Phloem | Ch. 14 (Evert), <i>Ch. 11 (Esau)</i> |
| 9 | M | 3/11 | Spring Break – No Class | ---- |
| 9 | W | 3/13 | Spring Break – No Class | ---- |
| 10 | M | 3/18 | Periderm – Cork & Anomalous Cambia | Ch. 15 (Evert), <i>Ch. 12 (Esau)</i> |
| 10 | W | 3/20 | Stems – Differentiation & Growth | <i>Ch. 16-17 (Esau)</i> |
| 11 | M | 3/25 | Exam #2 | ---- |
| 11 | W | 3/27 | Leaves – Organization and Organogenesis | <i>Ch. 18 (Esau)</i> |
| 12 | M | 4/01 | Leaves – Structural Variation | <i>Ch. 19 (Esau)</i> |
| 12 | W | 4/03 | External Secretory Structures | Ch. 16 (Evert), <i>Ch. 13 (Esau)</i> |
| 13 | M | 4/08 | Internal Secretory Structures | Ch. 17 (Evert), <i>Ch. 13 (Esau)</i> |
| 13 | W | 4/10 | Roots – 1° Structures & Differentiation | <i>Ch. 14 (Esau)</i> |
| 14 | M | 4/15 | Roots – Secondary Growth | <i>Ch. 15 (Esau)</i> |
| 14 | W | 4/17 | Flowers – Structure and Organogenesis | <i>Ch. 20 (Esau)</i> |
| 15 | M | 4/22 | Flowers - Sporogenesis and Gametogenesis | <i>Ch. 21 (Esau)</i> |
| 15 | W | 4/24 | Exam #3 | ---- |
| 16 | M | 4/29 | Fertilization & Embryogenesis | Ch. 1 (Evert), <i>Ch. 21 (Esau)</i> |
| 16 | W | 5/01 | Seeds, Fruits & Seedlings | <i>Ch. 22-24 (Esau)</i> |

Final Exam: Wednesday, May 8th, 10:30am – 12:30pm

Tentative Lab Schedule:

Lab handouts may include pages that will be turned in for credit toward the final lab score.

Questions based on lab activities may be incorporated into Lecture Exams.

Safety is as important to successful lab experience as engaged attendance. To that end, **10% will be deducted** from each lab score for failure to be ready to begin on time, for failure to wear minimal personal protective equipment, and/or for bringing food or drink into the lab.

The schedule of laboratory activities is listed below. Adjustments to the schedule may be made, as necessary.

| Week | Dates | Topic |
|-------------|--------------|--------------------------------------|
| 1 | 1/18 | Plant Body Structure; Embryos |
| 2 | 1/25 | Parenchyma |
| 3 | 2/01 | Collenchyma |
| 4 | 2/08 | Sclerenchyma |
| 5 | 2/15 | Epidermis |
| 6 | 2/22 | Xylem |
| 7 | 2/29 | Midterm Lab Practical |
| 8 | 3/07 | Phloem and Vascular Cambium |
| 9 | 3/14 | Spring Break (No Lab) |
| 10 | 3/21 | Laticifers |
| 11 | 3/28 | Easter Holiday Break (No Lab) |
| 12 | 4/04 | Roots |
| 13 | 4/11 | Stems |
| 14 | 4/18 | Leaves |
| 15 | 4/25 | Flowers, Fruits, and Seeds |
| 16 | 5/02 | Final Lab Practical |