PLS 597, Ecological Plant Physiology

COURSE SYLLABUS: FALL 2025

INSTRUCTOR INFORMATION

Instructor: Desire Djidonou, (Dr. D), Associate Professor – Urban/Sustainable Horticulture
Office Location: Ag/ET 248
Office Hours: T 1:00p – 2:00p; R 11:30a – 12:30p (Ag/ET), or by appointment on zoom.
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Preferred Form of Communication: email

COURSE INFORMATION

Time & location: Class will meet R: 3:00p - 5:50p Location: PSC 101.

Materials – Textbooks, Readings, Supplementary Readings

Optional Textbooks

1. Lambers, H., F.S. Chapin III and T.L. Pons. **Plant Physiological Ecology**, 2nd ed. Springer (2008). [Copy of this book will be uploaded on the course page in D2L].
2. Fitter, A.H., and R.K.M. Hay. **Environmental Physiology of Plants**, 3rd ed. Academic Press (2002).
3. Taiz, L., E. Zeiger, I.M. Moller and A. Murphy. **Plant Physiology and Development**, 7th ed. Sinauer Associates Inc. (2022).
4. Willey, N. **Environmental Plant Physiology**. 2016., New York, NY.
5. Hay, R. and J. Porter. **The Physiology of Crop Yield**, 2nd ed. Blackwell Publishing (2006).

Course Description

Advanced overview of how plants/crops interact with their environment. Emphasis will be on the primary environmental resources (light/energy, CO_2, O_2, water, and nutrients) and the fundamental processes plants use them in to synthesize organic compounds for their growth, development and productivity. Adverse effects of fluctuations in these abiotic factors and the morphological, biochemical, and molecular mechanisms by which plants are able to acclimate or adapt to the stressful environment will be discussed.
Prerequisites: PLS 381 or any one-semester introductory course in plant physiology.

The *syllabus/schedule are subject to change.*

Student Learning Outcomes

When successfully completing this course, the student will be able to:

1. Describe the fundamental plant processes of photosynthesis, respiration, transpiration, and mineral nutrition as influenced by light, temperature, CO_2, O_2, water and nutrients.
2. Demonstrate a comprehensive understanding of how these various physiological processes are integrated to form a functional plant in term of growth, development, and crop productivity.
3. Describe plant responses to various abiotic stress factors and the morphological, physiological, biochemical and molecular mechanisms employed by plants to adapt or acclimate to these abiotic stresses.
4. Develop writing skills through critical review and summary of scientific literature pertaining to ecological plant physiology.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Basic knowledge of Microsoft office (Word, Excel, and PowerPoint) and familiarity with D2L. Students will need reliable internet access to retrieve course materials and complete online quizzes and exams if needed.

Instructional Methods

Lectures: This is a lecture-based course with no laboratory activity. The lecture materials (PowerPoint slides, additional reading materials, and videos) will be made available on the course D2L page.

Student Responsibilities

Expectation of Students

1. Students are expected to review course materials within two days after being posted on D2L to follow the course progress;
2. Completion of homework assignments and exams by the due dates;
3. Late submission of assignments or make-up of quizzes, exams and other work in this course will only be allowed for legitimate, pre-excused absences.

ASSESSMENTS and GRADING

Course evaluation

Student's final grade will be based on 400 points total from exams, assignments, and literature review.

Items	Points
Exam 1	100
Exam 2	100
Cumulative final exam	100
Assignments	40
Literature review	60

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Grade Assignment

Letter grades for the course will be assigned according to the chart below:

A = 90%-100%

B = 80%-89%

C = 70%-79%

D = 60%-69%

F = 59% or Below

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by East Texas A&M University have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

YouSeeU Virtual Classroom Requirements:
https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu**.**

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:
https://community.brightspace.com/support/s/contactsupport

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

Timely reading of the course materials is required.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: https://www.britannica.com/topic/netiquette

TAMUC Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

Academic Integrity

Students at East Texas A&M University are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Graduate Student Academic Dishonesty 13.99.99.R0.10

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

AI use in course

East Texas A&M University acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.
In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty
13.99.99.R0.10 Graduate Student Academic Dishonesty

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
East Texas A&M University
Gee Library- Room 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Office of Student Disability Resources and Services

http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

East Texas A&M Supports Students' Mental Health

The Counseling Center at East A&M, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

Mental Health and Well-Being
The university aims to provide students with essential knowledge and tools to understand and support mental health. As part of our commitment to your well-being, we offer access to Telus Health, a service available 24/7/365 via chat, phone, or webinar. Scan the QR code to download the app and explore the resources available to you for guidance and support whenever you need it.

http://telusproduction.com/app/5108.html

Nondiscrimination Notice

East Texas A&M University will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in East Texas A&M University buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035

and East Texas A&M Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url:
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

COURSE OUTLINE / CALENDAR

Lecture topics

1. Introduction to environmental physiology of plants
2. **Light**
   a. Nature of light
   b. Photosynthesis: The light reactions
   c. Photosynthesis: The carbon reaction
   d. Photosynthesis – Respiration and Growth
   e. Light and Plant development
   f. Light duration and photoperiodism
3. **Gases**
   a. CO_2 and Plant growth
4. **Temperature**
   a. Heat, temperature, and energy budgets
   b. Temperature and crop growth and development
   c. Temperature and photosynthesis and respiration
   d. Heat, chilling, and freezing stress
5. **Water**
   a. Physical and chemical properties of water
   b. Plant water relations
   c. Water stress and water use efficiency
   d. Flooding stress
6. **Nutrients**
   a. Assimilation of inorganic nutrients
   b. Toxic environments and plant growth

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