



PLS 320, Soil Fertility and Plant Nutrition

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)
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Preferred Form of Communication: email

COURSE INFORMATION

Time & location:

Class will meet T&R: 9:30a - 10:45a Location: PSC 101.

Materials – Textbooks, Readings, Supplementary Readings

The following textbook is recommended as a good reference.

- J.L. Havlin, S.L. Tisdale, W.L. Nelson, and J.D. Beaton. 2014. **Soil Fertility and Fertilizers - An Introduction to Nutrient Management**, 8th Edition. ISBN 013503373X, Pearson Education.

Course Description

This course provides a thorough overview of the complex biogeochemical reactions influencing availability of nutrient elements in soils; processes by which plants absorb these elements from the soil, translocate them throughout the plant, and assimilate them for growth and development. Specific functions of these nutrients essential to plant growth, interactions among them, symptoms related to their deficiency and toxicity are also covered. Optimal nutrient management practices that maximize crop productivity and profitability while maintaining environmental quality will be outlined.

Prerequisites: PLS 309, PLS 1315 or PLS 1307.

The syllabus/schedule are subject to change.

Student Learning Outcomes

At the end of this class, students will be able to:

1. Describe the influence of soil chemical, biological, and physical properties and processes on nutrient cycling and availability to plants;
2. Describe plant nutrient uptake mechanisms, transport, and assimilation;
3. Describe the essential plant nutrients in relation to their functions, deficiency and toxicity symptoms;
4. Describe basic techniques of soil and plant tissue sampling for analysis of crop nutrients.
5. Estimate fertilizer application rates needed to meet crop nutrient demand;
6. Develop soil and nutrient management practices that maximize crop productivity and profitability while maintaining or enhancing soil health and environmental quality.

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: The lecture materials (PowerPoint slides and additional reading materials) will be made available on the course D2L page prior to the lecture.

Laboratory: Although there is no formal laboratory session associated with this course, we will carry out some experiments designed to help you learn more about concepts presented in lecture.

Student Responsibilities

Expectation of Students

1. Attendance to all classes and lab activities is required unless ill;
2. Be on time to class and lab;
3. Active participation in classroom discussions on topics brought out in lecture is highly encouraged;
4. Completion of homework assignments and quizzes by the due dates;
5. 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.

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ASSESSMENTS and GRADING

Course evaluation

Student's final grade will be based on 700 points total from exams, quizzes, assignments, and lab report.

Items	Points
Exam 1	100
Exam 2	100
Exam 3	100
Cumulative final exam	150
Quizzes	100
Homework assignments	100
Lab project	50

Exams: (Multiple Choice, T/F, Matching, Short Answer, Critical essay): There will be three one-hour exams and one 2-hour final exam. The exams will include material from lecture and any additional reading assignment. Exam dates are given below in the tentative semester schedule.

Quizzes: There will be 5 quizzes between exams intended to help you review concepts covered in the course. All quizzes will be available online for 48 hours in the D2L portal. The quiz will involve short questions to evaluate student learning of each complete chapter.

Homework assignments: 4-5 problem sets will be given throughout the semester to work on at home.

Special lab reports: Students will prepare short lab report on the special lab activities conducted.

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

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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

Attendance to lectures and lab activities are required unless ill.

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.

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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>

ETAMU 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'

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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/>

A&M-Commerce 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.

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<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 Texas A&M University-Commerce 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 A&M-Commerce 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.

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COURSE OUTLINE / CALENDAR

TR 9:30a-10:45a Location: PSC 101

Lecture Schedule

Week	Date	Lecture Topic	Reading from Havlin
1	Aug 26 T	Course introduction and syllabus review	-
	Aug 28 R	Basic Soil Chemistry Concepts	-
2	Sep 02 T	Introduction Soil Fertility and Plant Nutrition	Chapter 1
	Sep 04 R	Soil Nutrient Bioavailability	Chapter 2
3	Sep 09 T	Nutrient Absorption by Plant: Short and Long-Distance Transports	Chapter 2
	Sep 11 R	Soil Acidity and Alkalinity	Chapter 3
4	Sep 16 T	EXAM 1	
	Sep 18 R	Nitrogen–Cycling, uptake, assimilation, function, and deficiency, and management <i>Lab: Seeding for research project</i>	Chapter 4
5	Sep 23 T	Nitrogen–Cycling, uptake, assimilation, function, and deficiency, and management	Chapter 4
	Sep 25 R	Phosphorus–Cycling, uptake, function, and deficiency, and management	Chapter 5
6	Sep 30 T	<i>Lab: Set up N rate and nutrient deficiency trials</i>	
	Oct 02 R	Potassium–Cycling, uptake, function, and deficiency, and management	Chapter 6
7	Oct 07 T	Basics of Fertilizer Calculation	Handout
	Oct 09 R	Sulfur, Calcium, and Magnesium	Chapter 7
8	Oct 14 T	EXAM 2	
	Oct 16 R	<i>Lab activities: Apply nutrient solution treatments</i>	
9	Oct 21 T	Micronutrients: Iron, Zinc, Copper, Manganese, Boron	Chapter 8
	Oct 23 R	Micronutrients: Chloride, Molybdenum, Nickel, and Beneficial elements	Chapter 8
10	Oct 28 T	Soil Fertility Evaluation	Chapter 9
	Oct 30 R	Nutrient Management	Chapters 10
11	Nov 04 T	EXAM 3	
	Nov 06 R	Nutrient Interactions and Economics	Chapters 11
12	Nov 11 T	Agricultural Productivity and Environmental Quality	Chapter 12
	Nov 13 R	Agricultural Productivity and Environmental Quality	Chapter 12
13	Nov 18 T	<i>Lab activities: Apply nutrient solution treatments</i>	
	Nov 20 R	<i>Lab activities: Apply nutrient solution treatments</i>	
14	Nov 25 T	<i>Lab activities: Apply nutrient solution treatments</i>	
	Nov 27 R	No Class (Thanksgiving Break)	
15	Dec 02 T	<i>Lab report</i>	
	Dec 04 R	Class Review	
16	Dec 11 T	FINAL EXAM (8:00 – 10:00)	

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